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Assess the role of competitiveness on urban development in China. Shenzhen as an example

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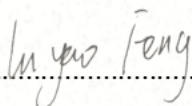
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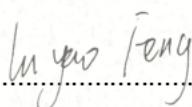
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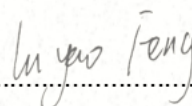
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Acknowledgements

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Abstract

Taking Shenzhen as a case in point, this research investigates the complementary function between urban competitiveness and regional preponderant industrial layout, with the aim of offering development references for other cities. The research is founded on the relevant theories regarding urban competitiveness and industrial layout development, in combination with the actual circumstances of Shenzhen. Through an in-depth analysis of the current situation and characteristics of Shenzhen's regional preponderant industrial layout, the evaluation of Shenzhen's position in the overall urban competitiveness of China and the analysis of the key factors, the contribution of the preponderant industries to Shenzhen's economic growth and the path to enhance competitiveness. Thus, exploring the advanced experience of Shenzhen's urban industrial layout and economic development to provide references for other cities.

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1. Introduction

1.1 Background of the Study

1.1.1 Overview of the global and Chinese urbanisation process

In the context of globalisation in the 21st century, urbanisation has become an important force driving economic and social development in the world. According to the United Nations, the proportion of the global urban population has grown from 30% in 1950 to 56% in 2020, and is expected to reach 68% by 2050. (Cheng, Chen & Tang , 2023) As the world's largest developing country, China's urbanisation process is particularly remarkable. Since the reform and opening up, China's urbanisation rate has risen rapidly from 17.9% in 1978 to 64.7% in 2021, with the number of cities increasing from 193 to 687 and an urban population of over 900 million (Dang & Li, 2023). This process has not only fuelled China's rapid economic growth, but also brought about profound changes in the urban and rural structure.

1.1.2 The Rise of Shenzhen as a Model of Urban Development

Shenzhen is undoubtedly a shining star in China's urbanisation process. Since the establishment of the Special Economic Zone in 1980, (Li, Chen & Grant, 2021) Shenzhen's GDP has grown from less than 200 million yuan to more than 3 trillion yuan in 2021, an increase of more than 15,000 times. (Feng, 2024) At the same time, Shenzhen's population has grown from just over 30,000 to over 17.79 million in 2024, with an urbanisation rate of nearly 100%. With its unique geographical location, favourable policy support, strong

innovation capability and open market environment, Shenzhen has attracted a large amount of domestic and foreign capital, technology and talents, and become one of the most dynamic and innovative cities in China's economy.

1.2 Research Significance

1.2.1 Theoretical significance: enriching the theory of urban competitiveness and industrial layout

Through in-depth analysis of Shenzhen's urban competitiveness and industrial layout, this study aims to enrich and improve the relevant theories of urban competitiveness and industrial layout. (LIANG, Bo, HUANG, JIANG & Xiaolin, 2021) By sorting out the history and current situation of Shenzhen's urban development, it reveals the constituent elements of its urban competitiveness and its evolution law, providing a new research perspective and empirical support for the theory of urban competitiveness. At the same time, by examining the characteristics and trends of Shenzhen's industrial layout, we will explore the influence mechanism of industrial layout on urban competitiveness and provide new theoretical support and practical cases for the theory of industrial layout.

1.2.2 Practical significance: providing development reference for other cities

The successful experience of Shenzhen not only provides valuable development experience and reference for other Chinese cities, but also sets a new benchmark for the global urbanisation process. (Ni, Kamiya, Guo & Xu,

2024) According to the reports of international authoritative research institutes, Shenzhen has been ranked among the top cities in the global urban competitiveness ranking for many years in a row, and its indicators such as innovation ability and business environment are particularly outstanding. Through a comprehensive analysis of Shenzhen's urban competitiveness and industrial layout, this study sums up its successful experience and development model, providing useful references and inspiration for other cities to formulate development strategies, optimise industrial layout and enhance urban competitiveness.

1.3 Formulation of Research Questions

1.3.1 Specific ranking and key factors of Shenzhen's urban competitiveness

This study first focuses on the specific position of Shenzhen in the global and Chinese city competitiveness ranking and the key factors behind this ranking. According to the assessment results released by authoritative organisations such as the China City Competitiveness Report, (Zhang, Sun & Meng, 2023) Shenzhen has ranked among the top three Chinese cities in terms of competitiveness for many consecutive years, and its key factors include the innovation environment, human resources, industrial base, policy support and the degree of internationalisation. This study will conduct an in-depth analysis of these key factors to reveal the mechanisms and evolutionary laws behind them.

1.3.2 Development Status and Future Trends of Shenzhen's Regional Advantageous Industries

This study also focuses on the development status and future trend of Shenzhen's regional advantageous industries. (Zhu & Tao, 2024) According to the work report of the Shenzhen Municipal Government, in 2023, Shenzhen's GDP will be 3.46 trillion yuan, with a growth rate of 6.0%, and the total economic volume will be the third in China and the fourth in Asia; the industrial output value of enterprises with annual revenue of 20 million yuan and above and the value-added of full-calibre industries will be the first in the country for two consecutive years.

The value-added of strategic emerging industries last year reached 1448.968 billion yuan, an increase of 8.8%, accounting for 41.9% of GDP (Luo & Liang, 2024). Among them, the new-generation electronic information industry grew by 3.1% to 571.712 billion yuan; the digital and fashion industry grew by 18.3% to 409.901 billion yuan; the high-end equipment manufacturing industry grew by 6.2% to 57.120 billion yuan; the green and low-carbon industry grew by 16.9% to 221.358 billion yuan; the new materials industry grew by 15.2% to 35.257 billion yuan; and the biomedicine and Health Industry decreased by 0.3% to 75.299 billion yuan; and Ocean Economy Industry decreased by 0.2% to 78.320 billion yuan. Through in-depth analyses of these leading industries, this study will reveal their development status, characteristics, etc., and predict their competitiveness-enhancing effects on Shenzhen's future development.

1.4 Research Purpose and Objectives

1.4.1 Elaboration of Research Objectives

This study aims to provide development reference and inspiration for other cities by comprehensively analysing the status quo and characteristics of Shenzhen's urban competitiveness and industrial layout, and revealing its successful experience and development model. At the same time, the study will also explore the interactive relationship and mechanism between urban competitiveness and industrial layout, so as to provide theoretical basis and practical guidance for urban planning and industrial development.

1.4.2 Setting of Research Objectives

The specific objectives of this study include: firstly, to reveal the constituent elements of Shenzhen's urban competitiveness and the evolution law through quantitative analysis; secondly, to reveal the characteristics and trends of Shenzhen's industrial layout through data analysis; thirdly, to explore the interactive relationship and mechanism between urban competitiveness and industrial layout through empirical research; fourthly, to provide useful references and inspiration for other cities to formulate development strategies, optimize industrial layout, and enhance urban competitiveness through case studies and comparative research. Fourthly, to provide useful references and inspiration for other cities to formulate development strategies, optimise industrial layout and enhance urban competitiveness through case analysis and comparative research. By achieving these objectives, this study will

provide new ideas and methods for urban development and industrial planning, and promote the sustainable development of urban economy and the overall progress of society.

2.Literature Review and Theoretical Foundations

2.1 Overview of urban competitiveness theory

Urban competitiveness theory is an important theoretical foundation for this study. (Feng, 2024) The theory originated in the 1980s to explain differences in the performance of different cities in the global economy. Urban competitiveness is often defined as a city's ability to attract, integrate and transform resources to create value and increase the well-being of its residents (Cefalo, Nielsen, Boczy & Parma, 2020). In order to fully understand the connotation of urban competitiveness, this study adopts the PESTEL model to highlight the fact that urban competitiveness is influenced by a variety of factors, including economic, social, environmental, and policy factors, and emphasises the role of key elements such as innovation, talent, and policy environment.

2.2 Research on the relationship between industrial layout and urban development

Industrial layout is one of the important factors affecting urban development. Reasonable industrial layout can optimise the allocation of resources, improve economic efficiency and promote the sustainable development of urban economy (Buck, Gordon & Harding, 2017). Scholars at home and abroad have

conducted in-depth research on the relationship between industrial layout and urban development. It is found that industrial layout is closely related to urban economic development. For example, the concentration of high-end industries such as high-tech industry and financial industry can enhance the economic strength and innovation ability of the city and promote the transformation and upgrading of the urban economy (Quattrone & Chen, 2023). At the same time, industrial layout can also affect the spatial structure and population distribution of the city, which in turn affects the development of the city's traffic, environment and other aspects.

Take Shenzhen as an example, the industrial layout of Shenzhen presents obvious characteristics of agglomeration and specialisation. The agglomeration of strategic emerging industries, future industries and other leading industries in Shenzhen not only enhances Shenzhen's economic strength and innovation capacity, but also promotes Shenzhen's urbanisation and modernisation. 2023, Shenzhen's fixed asset investment reached nearly one trillion, of which the government's work report puts forward that Shenzhen's fixed asset investment in 2024 will grow by 10% (Jiang, Lai, Guo, Li, Hong & Tang, 2024), which means that the scale of Shenzhen's investment this year will step up to the 1 trillion mark. These investments are mainly invested in the three major areas of modern industry, infrastructure and livelihood improvement, further promoting the optimisation of industrial layout and urban development.

2.3 Review of literature related to Shenzhen's urban development and competitiveness

Scholars at home and abroad have conducted extensive research on Shenzhen's urban development and competitiveness. It is found that Shenzhen's successful experience mainly includes the following aspects: firstly, government policy support and innovation drive; secondly, innovation ability and market competitiveness of enterprises; thirdly, concentration and mobility of talents; and fourthly, open and inclusive cultural atmosphere.

For example, some scholars have pointed out that Shenzhen's success lies in its unique innovation ecosystem and strong innovation capacity (Kresl, 2020).

A close co-operation network has been formed between the government, enterprises, colleges and universities, research institutes and other innovation main bodies in Shenzhen, which jointly promote the scientific and technological innovation and industrial upgrading in Shenzhen (Li, Zhang, Bai, Yin, Cheng & Tan, 2023). At the same time, Shenzhen also pays attention to the introduction and cultivation of talents, providing strong talent support for the city's innovative development. In addition, there are scholars who have quantitatively assessed Shenzhen's urban competitiveness. (Zhang, Sun & Meng, 2023) According to the assessment results of authoritative organisations such as the China City Competitiveness Report, Shenzhen has been at the top of the city competitiveness rankings for many years, and its indicators such as the innovation environment, talent resources and industrial

base are all outstanding.

2.4 Theoretical Framework Construction: Interaction Mechanism between City Competitiveness and Regional Advantageous Industries

Based on the above literature review and theoretical foundation, the relationship between Shenzhen's urban competitiveness and regional advantageous industries, which are mutually promoting and interdependent, will be further studied.

On the one hand, city competitiveness is an important support for the development of regional advantage industries (Li, Wu, Lin, Li & Du, 2020). The city's economic strength, innovation ability, talent resources and other elements provide a strong guarantee and support for the development of regional advantageous industries. For example, the economic strength and innovation ability of Shenzhen provides a favourable environment and conditions for the development of leading industries such as high-tech industry and financial industry.

On the other hand, regional advantageous industries are also an important way to enhance the competitiveness of the city. The development of regional dominant industries can drive the growth and transformation and upgrading of the city's economy and enhance the city's comprehensive strength and competitiveness(LIANG, Bo, HUANG, JIANG & Xiaolin, 2021). For example, the development of leading industries such as high-tech industry and financial industry in Shenzhen not only promotes Shenzhen's economic growth and

industrial upgrading, but also enhances Shenzhen's innovation ability and internationalisation level.

3. Analysis of Shenzhen's position in the overall competitiveness of Chinese cities and key factors

3.1 Assessment of Shenzhen's City Competitiveness Ranking

3.1.1 Assessment Methodology and Data Sources

The assessment of Shenzhen's urban competitiveness is mainly based on a number of authoritative reports and data sources, including, but not limited to, the China Urban Competitiveness Report, the China Urban Development Report, and official data released by the National Bureau of Statistics and local statistical bureaus. The assessment methodology adopts questionnaire analysis, and comprehensively analyses Shenzhen's urban competitiveness by constructing a system that includes multiple dimensions such as economy, society, environment, innovation and talent.

3.1.2 Shenzhen's Competitiveness Ranking among Major Cities in China

According to authoritative reports such as the China City Competitiveness Report, Shenzhen's competitiveness ranking among China's major cities has been at the top for many consecutive years (Zhang, Sun & Meng, 2023). In particular, Shenzhen's performance is particularly outstanding in terms of innovation environment, talent resources and industrial base. For example, in the report released in 2024, Shenzhen was ranked third in the country in terms of the overall competitiveness of cities (Zhu & Tao, 2024), just behind Beijing

and Shanghai, but in certain individual indicators, such as innovation capability and talent attractiveness, Shenzhen even surpassed Beijing and Shanghai.

3.1.3 Comparative analysis of competitiveness with other first-tier cities

Compared with other first-tier cities, Shenzhen shows unique competitiveness in several aspects. For example, in terms of economic scale, although Shenzhen is slightly inferior to Beijing and Shanghai, its economic growth rate is much higher than these two cities, showing a strong momentum of development (Quattrone & Chen, 2023). In terms of innovation capacity, Shenzhen ranks among the top in the country in terms of the number of scientific research institutions, the number of high-tech enterprises and the number of patents, especially in cutting-edge areas such as artificial intelligence, biotechnology and new energy (Chen, 2022). In addition, Shenzhen also excels in talent attraction and internationalisation, with its open and inclusive cultural atmosphere and superior living environment attracting a large number of domestic and foreign talents to converge.

3.2 Analysis of key factors driving Shenzhen's competitiveness

3.2.1 Economic scale and growth rate

Shenzhen's economic scale and growth rate are the solid cornerstones of its competitiveness. According to the latest data, in the first three quarters of 2024, Shenzhen's GDP reached 2593.428 billion yuan, a year-on-year growth of 5.4%, higher than the national economic growth rate of 4.8%. Among them, the value added of the secondary industry was 967.945 billion yuan, up 8.7%

year-on-year, showing strong industrial growth momentum. In addition, Shenzhen's fixed asset investment also maintained steady growth, with the city's fixed asset investment increasing by 3.3% year-on-year from January to October 2024, of which industrial investment grew strongly by 26.4%, demonstrating Shenzhen's continued investment in industrial upgrading and infrastructure construction.

In terms of economic growth rate, Shenzhen has long maintained a growth rate higher than the national average. For example, in 2023, Shenzhen's GDP growth rate ranked among the top tier cities, demonstrating its strong economic vitality and development potential (Dang & Li, 2023). This fast-growing economic scale provides Shenzhen with sufficient financial resources and employment opportunities, laying a solid foundation for its development in innovation, talent and industry.

3.2.2 Analysis of Innovation Capacity

Shenzhen's innovation capacity is the core of its competitiveness. Shenzhen's investment and achievements in science and technology innovation rank among the top in the country. (Deng & Chen, 2023) According to statistics, in 2023, Shenzhen's investment in research and experimental development reached 223.661 billion yuan, an increase of 18.9%, for the first time to achieve the total volume and intensity of the national city 'double second'. Among them, Shenzhen enterprises invested RMB 208.578 billion in R&D, accounting for 93.3% of the whole society's R&D investment, and the total

amount of R&D investment by enterprises ranked the first among all cities in China.

In terms of innovation achievements, Shenzhen ranks first in the country in terms of the number and quality of patents. (Zhu & Tao, 2024) By the end of 2023, Huawei held more than 140,000 valid authorised patents worldwide, and the cumulative number of publicly available patents had exceeded 336,000; Tencent's total number of patent applications worldwide exceeded 75,000, and the number of authorised patents exceeded 37,000. These innovations not only provide strong support for Shenzhen's industrial upgrading and economic development, but also make important contributions to scientific and technological innovation across the country and the world.

In addition, Shenzhen also has many high-tech enterprises and scientific research institutions, which are not only numerous but also of high quality, forming a strong innovation cluster effect (Zhang, 2024). This innovation cluster effect has provided a constant impetus for Shenzhen's innovation development, promoting Shenzhen's continuous breakthroughs in frontier fields such as artificial intelligence, biotechnology and new energy.

3.2.3 Talent Pool Construction

Shenzhen has also achieved remarkable results in talent pool construction. Shenzhen has a number of well-known universities and research institutions, such as the Southern University of Science and Technology and Shenzhen University, which have provided Shenzhen with abundant talent resources. In

addition, Shenzhen has also introduced a series of talent introduction policies, attracting a large number of domestic and foreign outstanding talents to converge.

(Zhang, 2024) According to the latest data, the total number of various types of talents in Shenzhen has exceeded 6.98 million, with more than 26,000 high-level talents and more than 200,000 returned overseas students. These talents provide strong support for innovation and industrial development in Shenzhen. At the same time, Shenzhen's labour market is also very active, providing a wide range of employment and development space for all kinds of talents. This rich talent resource provides a constant impetus for innovation and industrial development in Shenzhen.

3.2.4 Policy environment and institutional advantages

Shenzhen's policy environment and institutional advantages are also an important source of its competitiveness. As a special economic zone in China, Shenzhen enjoys a more relaxed policy environment and high administrative efficiency. This policy environment provides a strong guarantee for innovation and industrial development in Shenzhen. (Huang, Guo, Shi & Ma, 2015) At the same time, Shenzhen also pays attention to the construction of the rule of law, with a comprehensive legal and regulatory system and strong protection of intellectual property rights, which provides a favourable rule of law environment for the innovative development of enterprises. In addition, Shenzhen also actively promotes market-oriented reform and opening up to

the outside world, providing a fair, just and transparent market environment for all kinds of market players.

4. Development History, Current Situation and Future Trends of Industries with Regional Advantages in Shenzhen

4.1 Macro-environmental analysis

Questionnaire participants	Number
Professionals: such as experts and scholars, teachers, doctors, lawyers, engineers, etc.	79
Freelancers: such as writers, artists, photographers, tour guides, etc.	17
Workers: such as factory workers, construction workers, urban sanitation workers, etc.	13
Staff of institutions, state-owned enterprises, government and social organisations.	64
Senior managers of enterprises, such as enterprise CEO, CTO, COO, etc.	37
Students	5

Table 1 Statistics on the number of participants in the questionnaire survey

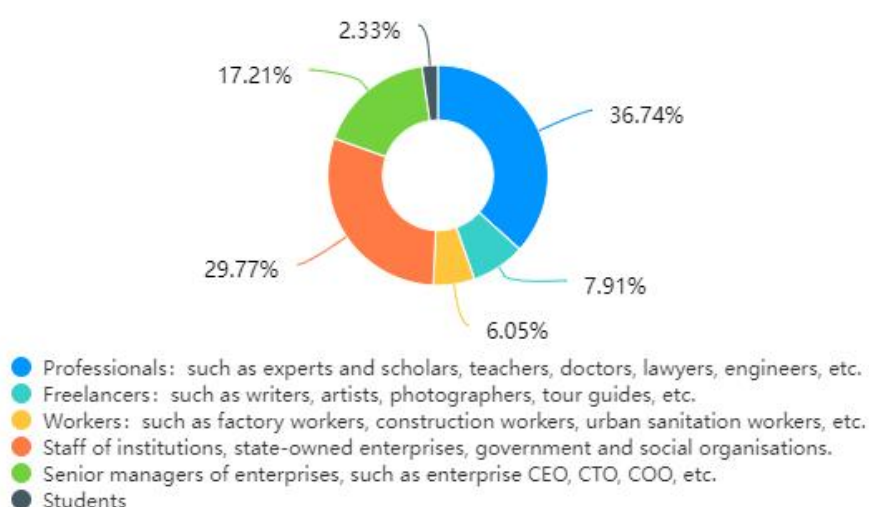


Figure 1 Percentage of occupational types of participants in the questionnaire survey

In order to further optimise the research, a total of 215 professionals working in Shenzhen, senior managers of enterprises, state-owned enterprises and government staff carried out a questionnaire survey on the layout and development status of Shenzhen's regionally advantageous industries, in-depth understanding of the impact of economic, social, environmental, policy and other factors on the development of the city, and related analysis through the PESTEL model.

4.1.1 Political Factors

(1) Support or restriction of government policies on industrial development

When discussing the driving factors for the optimisation of Shenzhen's industrial layout, government policies undoubtedly occupy a pivotal position. According to the analysis of the questionnaire survey, the policy of science and technology innovation and industrial upgrading, with its 38.6% support rate, highlights its central position in promoting the transformation and upgrading of Shenzhen's economy. These policies not only provide substantial support such as R&D funding and tax incentives, but also build a bridge from idea to market for start-ups by constructing an innovation ecosystem including incubators and accelerators. (Sun, 2023) In particular, the 'Peacock Plan' and other talent introduction policies, with their unique attraction, have injected a steady stream of vitality into Shenzhen's science and technology innovation.

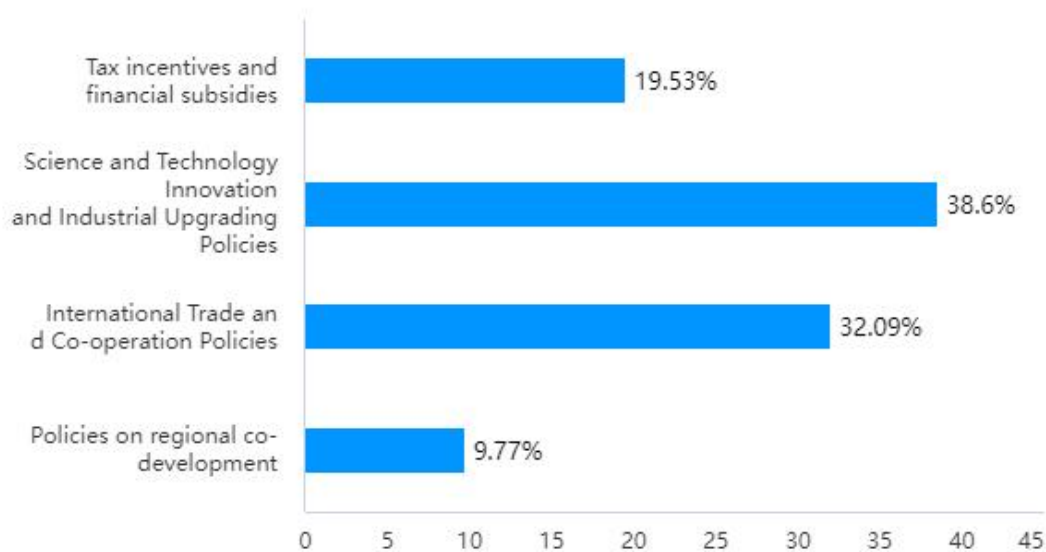


Figure 2 Questionnaire survey: Currently the most important national policy support for optimising the industrial layout in Shenzhen

At the same time, international trade and cooperation policies were also widely recognised by 32.09%, highlighting Shenzhen's positive stance in the process of global economic integration. By signing free trade agreements and organising international economic and trade forums, the government has not only opened the door to the international market for enterprises, but also facilitated the international flow of technology, capital and other factors of production, which has further strengthened Shenzhen's international competitiveness. (Vardaro, 2020) In addition, Shenzhen's active participation in the 'Belt and Road' initiative has opened up new growth points for its industrial development.

In the cultivation of strategic emerging industries, the Shenzhen Municipal Government has issued a series of policies, such as 'Opinions on Accelerating

the Cultivation and Growth of Strategic Emerging Industry Clusters and Future Industries', to provide all-round support in terms of finance, taxation, land and other aspects, forming a perfect policy system. (Wang, Hu, Dai & Burns, 2021) At the same time, the government has also strengthened the restriction and elimination of high-pollution and high-energy-consumption industries, promoting the green transformation and high-quality development of the industrial structure.

In this process, the government has also focused on giving full play to the decisive role of the market in the allocation of resources, and has stimulated the innovation vitality and market competitiveness of enterprises by optimising the business environment and improving the market mechanism. (Sun, 2023) At the same time, the close cooperation between the government and social organisations has provided strong support for industrial development.

(2) Political stability and legal environment

As the frontier of China's reform and opening-up, Shenzhen's political stability provides a solid cornerstone for industrial development. The government continues to promote the construction of the rule of law and improve the legal and regulatory system, which provides a strong guarantee for the fairness and impartiality of the market environment (Zhang, Lou & Ning, 2021). In particular, in terms of intellectual property protection, Shenzhen has established a strict intellectual property protection system, which effectively protects innovations and stimulates the innovation drive of enterprises through measures such as

stepping up law enforcement and raising the cost of violating the law.

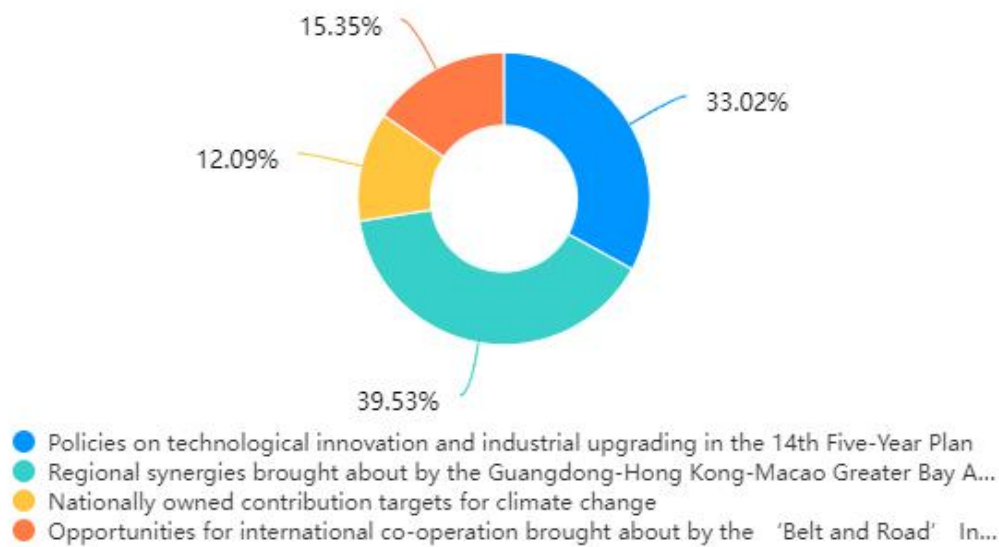


Figure 3 Questionnaire: Which Chinese policy has had the most significant impact on Shenzhen's industrial layout

The in-depth implementation of the Guangdong-Hong Kong-Macao Greater Bay Area Development Plan has had a profound impact on Shenzhen's industrial layout. As one of the core cities of the Greater Bay Area, Shenzhen has not only benefited from the resource clustering effect brought about by regional synergy, but also promoted the economic development of the neighbouring regions through the export of advanced technology and management experience (Zhang, Shen & Gao, 2021). In this process, Shenzhen's industrial development and regional synergy have formed a benign interaction, jointly promoting the prosperity of the regional economy.

In addition, the policy orientations of the 14th Five-Year Plan on scientific and technological innovation and industrial upgrading provide a clear path and

strong support for the high-quality development of Shenzhen's industries (Wei & Zhang, 2024). These policies not only specify the key areas and development directions of science and technology innovation and industrial upgrading in the next five years, but also put forward specific implementation paths and safeguard measures, which provide a strong policy guarantee for the transformation and upgrading of Shenzhen industries.

In terms of the legal environment, the Shenzhen government has also strengthened market supervision and anti-monopoly law enforcement, maintaining the order of fair competition in the market (Xu, Zheng, Huang, Song, Long, Zhan, Jiang, Wang, Shu & Zheng, 2022). At the same time, the government has also actively promoted the construction of a social credit system, which has enhanced the sense of integrity and credit level of market players by improving the credit information sharing mechanism, credit evaluation, rewards and penalties, and so on. These measures not only help optimise the market environment, but also promote healthy economic development.

It is worth noting that the Shenzhen government also focuses on the role of social forces in the process of promoting industrial development. By strengthening cooperation with social organisations such as industry associations and chambers of commerce (Sun, 2023), it jointly promotes the development and upgrading of industries. At the same time, the government also encourages enterprises and social organisations to participate in the

formulation of industry standards and technical specifications, which promotes the standardisation and normative development of the industry. These initiatives have not only enhanced the international competitiveness of Shenzhen industries, but also laid a solid foundation for their sustainable development.

4.1.2 Economic factors

(1) Economic growth rate and industrial structure

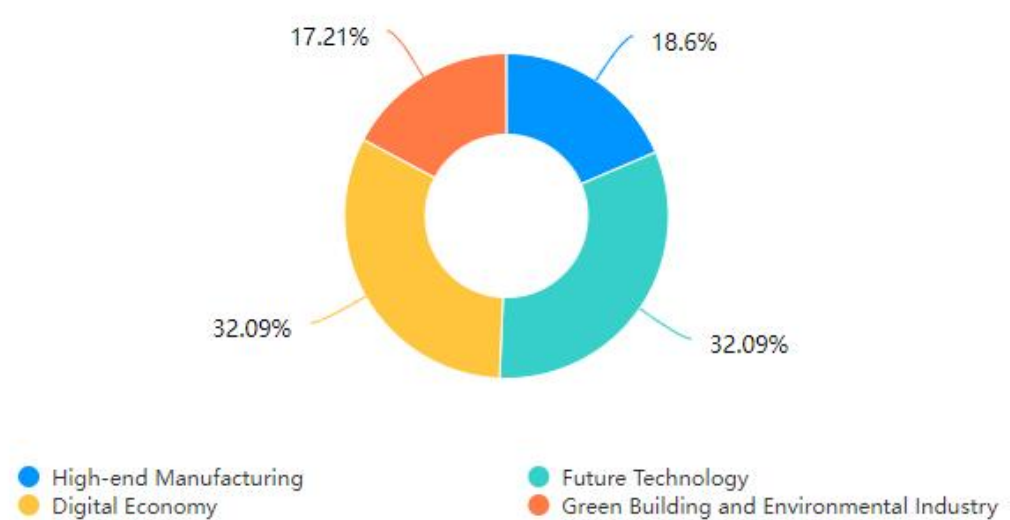


Figure 4 Questionnaire: Which industrial sector has the highest growth potential in Shenzhen?

Under the dual background of global economic integration and digital transformation, Shenzhen, as a pioneering city in China's economy, has attracted much attention for its economic growth rate and the optimisation path of its industrial structure (Pan & Du, 2021). According to the survey data, the digital economy and future technology each received 32.09% support, becoming the industrial sectors with the most growth potential in Shenzhen in

the eyes of the participants. This result not only reflects the market's wide recognition of Shenzhen in the field of science and technology innovation, but also reveals the important position it occupies in the global competition in science and technology. Supporting SMEs and entrepreneurship and innovation (60.93% of the total), optimising industrial structure and increasing value-added (59.07% of the total), as the core driving force for the optimisation of Shenzhen's industrial layout, was strongly endorsed by the participants, further highlighting the far-reaching impact of the innovation-driven development strategy in Shenzhen's practice.

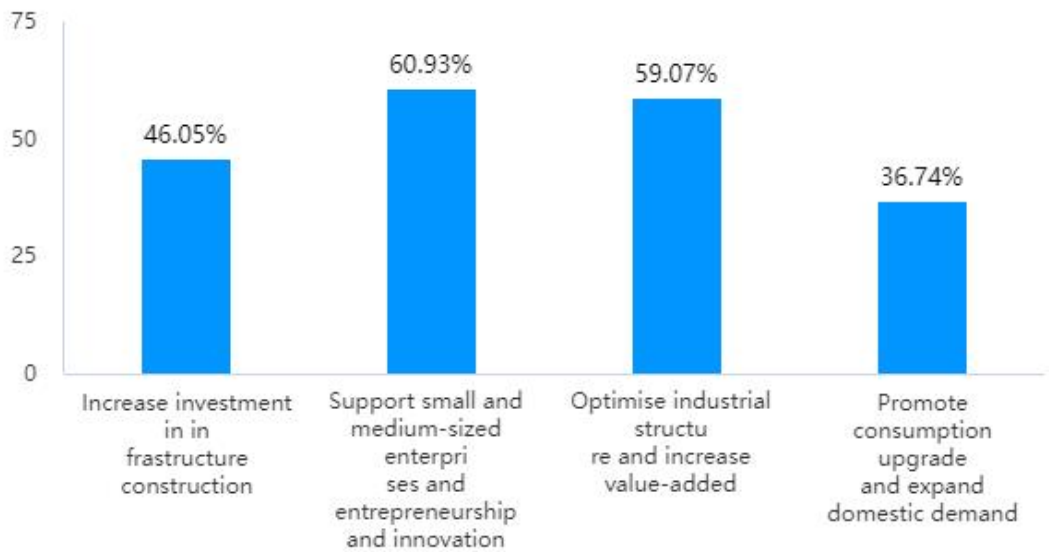


Figure 5 Questionnaire: In the face of economic downward pressure, how should Shenzhen adjust its industrial layout to stimulate economic growth

Shenzhen's GDP growth rate continues to run at a high level, an achievement that cannot be achieved without the in-depth optimisation of its industrial structure and the rapid rise of strategic emerging industries. The strategic emerging industries represented by artificial intelligence, biotechnology, new

energy, etc. have not only promoted the rapid growth of Shenzhen's economic aggregate, but also facilitated the advancement and rationalisation of the economic structure (Luo & Liang, 2024). At the same time, Shenzhen has not neglected the transformation and upgrading of traditional industries, and through policy guidance, technological transformation and market mechanism innovation, the added value and market competitiveness of traditional industries have been continuously improved, realising the effective conversion of old and new kinetic energy. This process of industrial structure optimisation not only reflects Shenzhen's foresight and strategic vision in economic development, but also wins the initiative for it in the global economic competition.

In addition, Shenzhen also pays attention to the industrial cluster effect in the process of industrial structure optimisation. By building industrial clusters centred on industrial chain, value chain and innovation chain, Shenzhen not only improves the efficiency of collaborative industrial development (Wei & Zhang, 2024), but also promotes the virtuous cycle of technology overflow and industrial upgrading. The formation of this industrial cluster effect not only enhances the international competitiveness of Shenzhen industries, but also provides a strong support for it to occupy a higher position in the global industrial chain.

(2) International Trade and Investment Environment

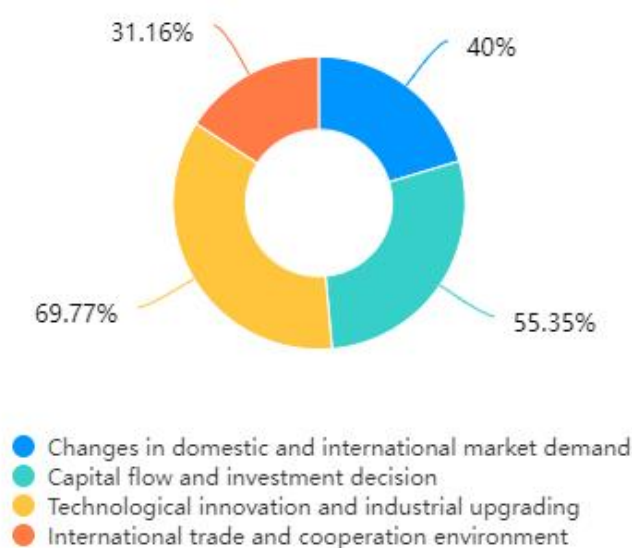


Figure 6 Questionnaire: Which economic factor has the most significant impact on the industrial layout of Shenzhen?

As an important window of China's opening up to the outside world, Shenzhen's international trade and investment environment not only has a high degree of openness and inclusiveness, but also presents diversified and multi-level characteristics (Song, Stead & de, 2020). Shenzhen actively participates in the construction of the global industrial chain and value chain, and by deepening international cooperation, it has broadened the access channels of the international market and provided a broader development space for local enterprises. 55.35% of the participants believe that capital flows and investment decisions have a significant impact on Shenzhen's industrial layout, a result that fully explains the key role of capital in the allocation of global resources and Shenzhen's unique position as an important node of capital flows. This result fully illustrates the key role of capital in global

resource allocation and the unique position of Shenzhen as an important node of capital flows.

Further analysis shows that Shenzhen's advantages in international trade and investment environment are mainly reflected in the following aspects: First, the continuous optimisation of the policy environment. The Shenzhen government has provided a more liberal and efficient policy environment for international trade and investment by simplifying the examination and approval process, lowering trade barriers and improving the accessibility of foreign capital. The second is the continuous improvement of infrastructure construction. Shenzhen has an advanced logistics system (Li, Wu, Lin, Li & Du, 2020), communication network and financial service system, which provides a solid foundation and support for international trade and investment. Third, the innovation and openness of financial services. The high degree of openness of Shenzhen's financial market and the richness and diversity of financial products provide diversified investment choices and risk management tools for international capital. Fourth, the deepening and expansion of international cooperation. (Liu, Ni, Niu, Li & Li, 2021) Shenzhen actively participates in international economic and trade co-operation and exchanges, and has strengthened its ties and co-operation with the international market by signing free trade agreements and holding international economic and trade forums, providing a good international trade and investment environment for industrial development.

These advantageous conditions together constitute a strong gravitational field for Shenzhen to attract foreign investment and promote international trade. Shenzhen has not only attracted a large number of foreign-funded enterprises and investment, but also promoted local enterprises to 'go out' to participate in international competition (Ma, Wang & Szmedra, 2019). This two-way interactive process not only promotes Shenzhen's sustained economic growth and industrial upgrading, but also in the global economic competition to win a broader space for development and international influence.

4.1.3 Social Factors

(1) Demographic structure and innovation atmosphere

Shenzhen's demographic characteristics, especially its youthfulness, diversity and high mobility, have infused the city with unlimited innovative vitality. (LIANG, Bo, HUANG, JIANG & Xiaolin, 2021) This demographic structure not only implies a more flexible and open mindset, but also provides a broad space for the development of education in Shenzhen. (Sun,2023) Shenzhen attaches great importance to the development of education, and through the introduction of high-quality educational resources from home and abroad, it has established a number of higher education institutions and scientific research institutes including Shenzhen University, Southern University of Science and Technology, The Chinese University of Hong Kong (Shenzhen) and other renowned colleges and universities, which not only provide a steady stream of high-quality talents for the development of Shenzhen's industries,

but also, through academic research, technological innovation and the transformation of achievements, offer strong intellectual support for Shenzhen's innovation and development through academic research, technological innovation and transformation of achievements.

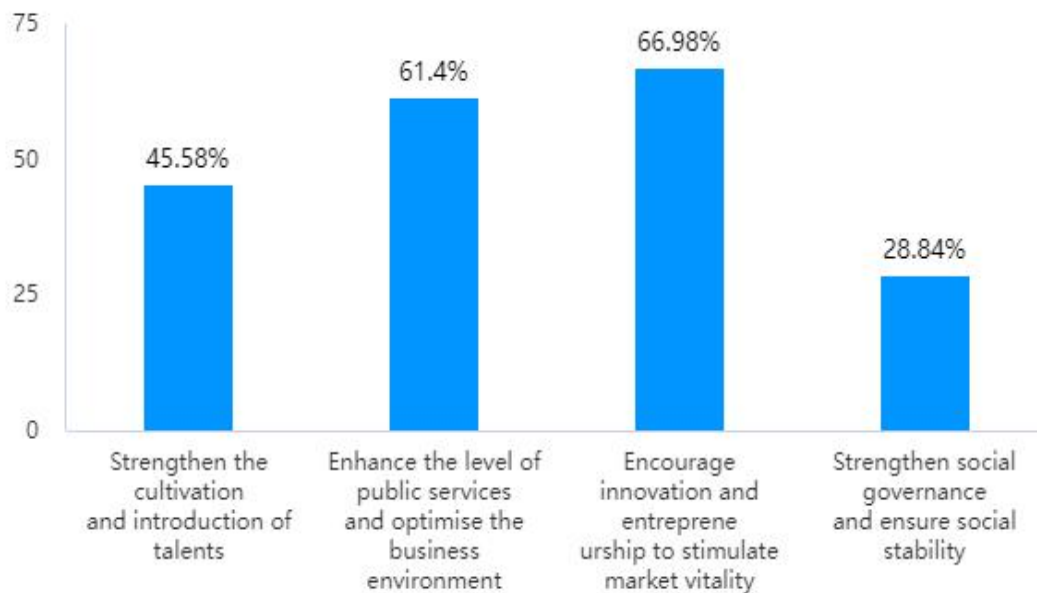


Figure 7 Questionnaire: In promoting industrial upgrading and layout optimisation, how should Shenzhen make full use of its social resource advantages

The young demographic structure of Shenzhen brings the desire for new knowledge and the pursuit of new technologies, and this atmosphere promotes the collision of innovative thinking and the generation of ideas (Song, Stead & de, 2020). At the same time, Shenzhen's diverse demographic structure also brings about the integration of different cultural backgrounds and values, and this integration not only enriches the city's cultural connotation, but also provides more possibilities for innovation. The data shows that 39.07% of the participants believe that the enhancement of the innovation and

entrepreneurial atmosphere is the biggest impact of Shenzhen's demographic changes on the industrial layout, a figure that further proves Shenzhen's significant advantage in attracting a young population and innovative talents, as well as the positive impact of this advantage on the innovation atmosphere.

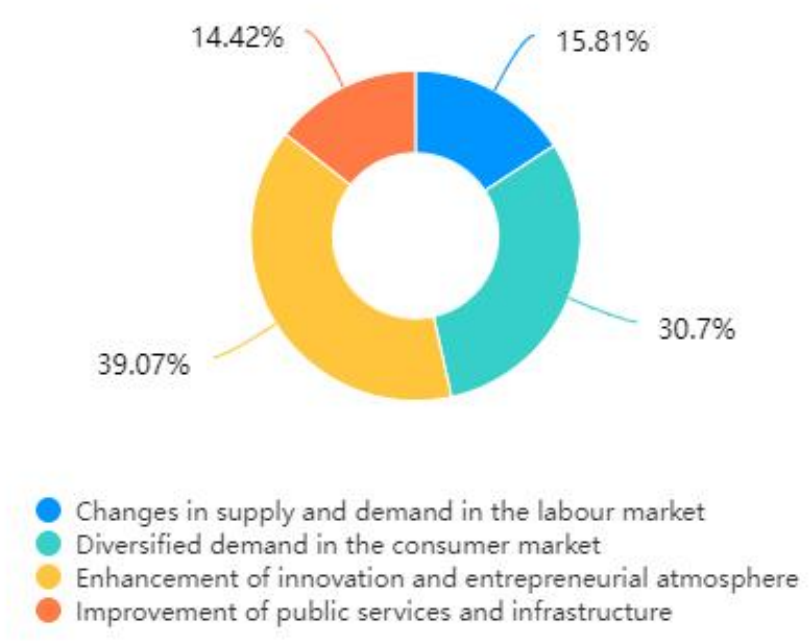


Figure 8 Questionnaire: The greatest impact of demographic change on industrial layout in Shenzhen

In addition, Shenzhen has further stimulated the innovation vitality of the whole society by organising various innovation and entrepreneurship competitions, establishing business incubators and providing policy support(Luo& Shen, 2022). These measures not only provide entrepreneurs with a favourable entrepreneurial environment and resource support, but also promote the transformation and application of innovation results, injecting new momentum into Shenzhen's industrial development.

(2) Social values and consumption habits

Changes in the quality of life and consumption habits of Shenzhen residents are a direct reflection of the changes in social values in Shenzhen. With the rapid development of the economy and the improvement of the income level of the residents, the consumption concepts of Shenzhen residents have gradually changed from 'meeting basic needs' to 'the pursuit of high quality of life' (Pan & Du, 2021). They not only pay attention to the practicality and cost-effectiveness of products, but also pay more attention to the innovation, personalisation and cultural connotation of products. This change in consumption habits not only promotes the development of new industries, but also promotes the transformation and upgrading of traditional industries.

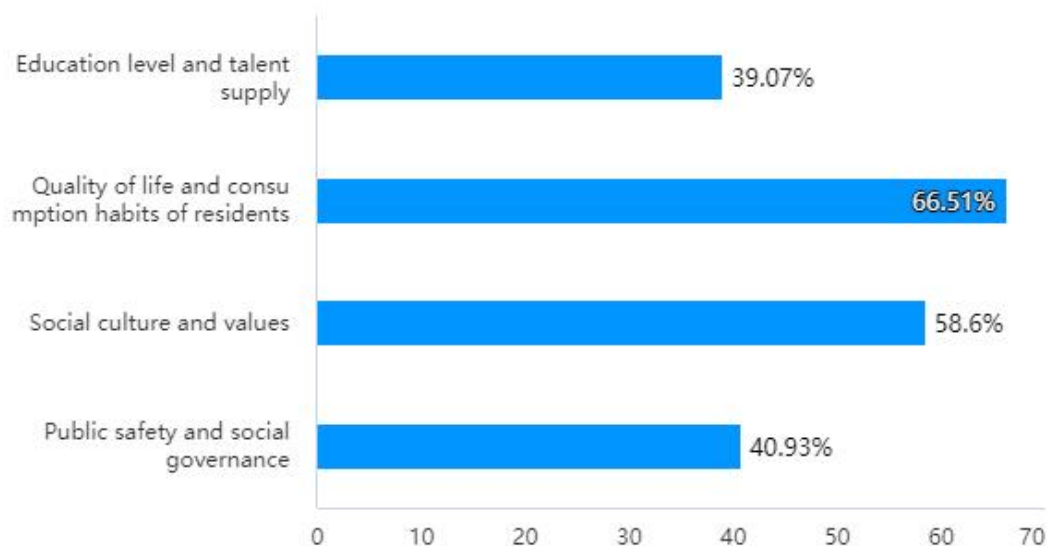


Figure 9 Questionnaire: Which social factors have an important influence on the industrial layout of Shenzhen

Shenzhen residents' pursuit of innovation and personalised consumption

provides a broad market space for the development of emerging industries and high-tech industries. For example, in the fields of intelligent hardware, e-commerce and cultural creativity, Shenzhen enterprises have won wide recognition in the market with their innovative products and services. At the same time, Shenzhen residents' pursuit of a high quality of life has facilitated the transformation and upgrading of traditional industries in the direction of high-end, intelligent and green industries (Sun, 2023). This process of industrial upgrading not only improves the competitiveness of enterprises, but also promotes the synergistic development of the entire industrial chain.

The data shows that 66.51% of the participants believe that the quality of life and consumption habits of residents have an important impact on the industrial layout of Shenzhen. This data fully illustrates the important role of changes in market demand in driving industrial restructuring in Shenzhen. Enterprises in Shenzhen have keenly captured this market trend and have increased their investment in research and development to launch new products and services that meet market demand. (Wei & Zhang, 2024) At the same time, the Shenzhen government also encourages enterprises to increase technological innovation and R&D investment by introducing relevant policies, which provides a strong policy guarantee for industrial development.

4.1.4 Technical factors

(1) Scientific and technological innovation and R&D capability

Shenzhen, as an important pole of science and technology innovation in China

and even globally, its science and technology innovation and R&D capability has a profound and complex impact on the industrial layout. Shenzhen's STI ecosystem is known for its high degree of openness, flexibility and innovation, which is not only reflected in the continuous research and development of new technologies and products by scientific research institutions and enterprises, (Zhang, Lou & Ning, 2021) but also in the in-depth understanding and practice of innovation concepts. Shenzhen's research institutes, such as the Shenzhen Institute of Advanced Technology of the Chinese Academy of Sciences and the Research Institute of Tsinghua University in Shenzhen, work closely with enterprises to form an innovation model that integrates industry, academia and research, and accelerates the transformation and application of scientific and technological achievements.

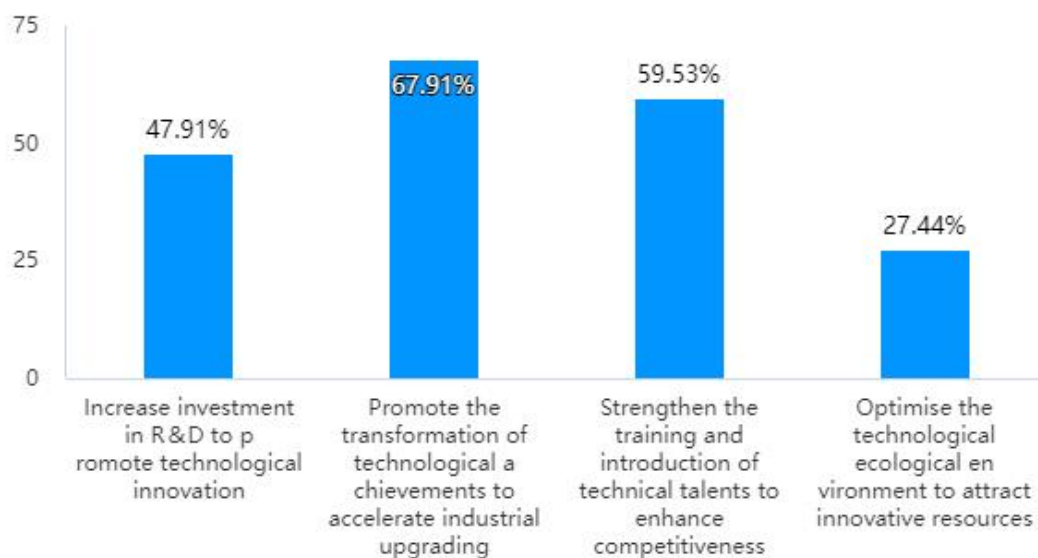


Figure 10 Questionnaire: Ways of Adjusting Industrial Layout in Shenzhen in the Face of Technological Change

Shenzhen has achieved remarkable results in the fields of information technology, biotechnology, new materials and new energy, etc (Zhang, 2024). Innovations in these fields have not only promoted the development of related industries, but also provided important support for industrial upgrading and structural adjustment in Shenzhen. For example, in the field of information technology, Shenzhen's R&D and application of technologies such as 5G communications, Internet of Things and cloud computing have been at the forefront of the country and the world, providing a strong technological guarantee for the development of emerging industries such as smart manufacturing and smart cities.

In addition, Shenzhen is actively promoting digital and intelligent transformation, and strengthening the R&D and application of new-generation information technologies such as big data and artificial intelligence (Vardaro, 2020). The application of these technologies not only improves production efficiency and service quality, but also promotes innovation and change in industrial models. For example, intelligent manufacturing enterprises in Shenzhen have made use of big data and artificial intelligence technologies to achieve intelligent management and optimisation of the production process, improving production efficiency and product quality.

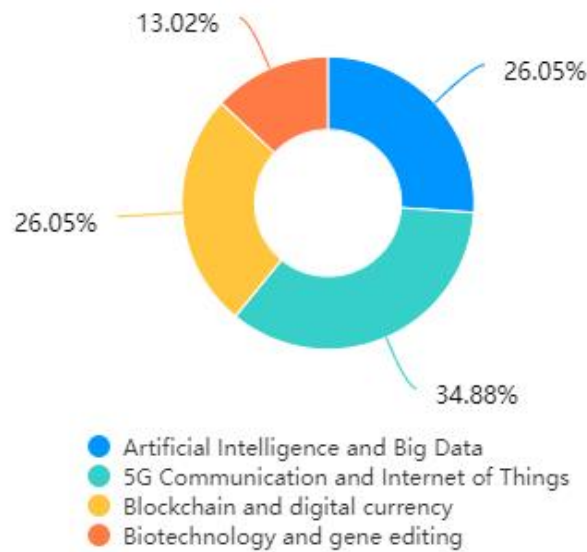


Figure 11 Questionnaire: Technologies with the Most Disruptive Potential in Shenzhen's Current Industrial Layout

According to the survey analysis, 5G communication and Internet of Things are considered the most disruptive potential technologies in the current industrial layout of Shenzhen, accounting for 34.88%. This data not only reflects Shenzhen's leading position in science and technology innovation and the application of new technologies, but also reveals the important impact of these technologies on Shenzhen's industrial layout. By promoting the wide application of 5G communication and IoT technologies, Shenzhen will further optimise its industrial layout and enhance its industrial competitiveness.

(2) Technology Introduction and Transformation of Achievements

Shenzhen not only focuses on independent R&D in technological innovation, but also pays great attention to technology introduction and achievement transformation. (Song, Stead & de, 2020) Through the introduction of

international advanced technology and management experience, Shenzhen continuously improves its own technical level and innovation ability. This way of technology introduction not only shortens the cycle of technology research and development, but also improves the efficiency and quality of technological innovation. By establishing co-operative relationships with internationally renowned scientific research institutions and enterprises, Shenzhen has introduced a number of technologies and talents of internationally advanced level, which have provided strong support for Shenzhen's technological innovation and industrial development.

At the same time, Shenzhen also actively promotes the cooperation between industry, academia and research, and strengthens the combination of technological innovation and industrialisation. (Shen & Wang, 2020) University-Industry-Research Cooperation is an important way of technological innovation and industrial upgrading, which can achieve effective docking between scientific research results and market demand, and promote the industrial application of scientific and technological achievements. By building an industry-university-research co-operation platform, Shenzhen has promoted close co-operation among research institutes, universities and enterprises, and accelerated the transformation and application of technological achievements (Luo & Shen, 2022). For example, many universities and research institutes in Shenzhen have established long-term cooperative relationships with enterprises to jointly carry out technological

research and development and industrialisation application, which has promoted the rapid development of related industries.

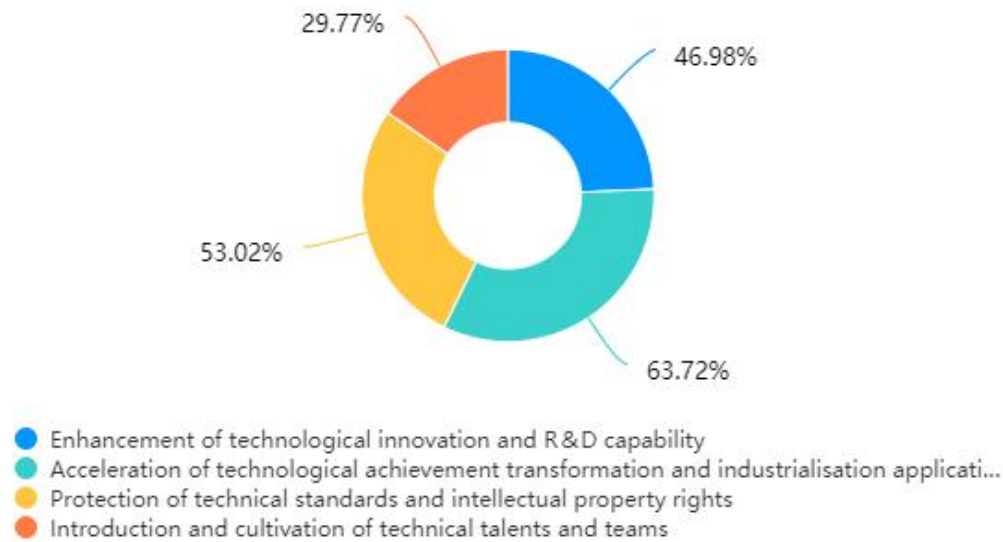


Figure 12 Questionnaire: Which technological factors are crucial for the optimisation of Shenzhen's industrial layout

According to the analysis of the survey, 63.72% of the participants believe that the acceleration of the transformation and industrialisation application of technological achievements plays a key role in the optimisation of Shenzhen's industrial layout. This data fully illustrates the importance of effectively transforming technological achievements into industrial applications. By strengthening technology introduction, achievement transformation and cooperation between industry, academia and research, (Li, Wu, Lin, Li & Du, 2020) Shenzhen has not only improved the efficiency and quality of technological innovation, but also promoted the synergistic development of the industrial chain and optimised the industrial layout.

In addition, Shenzhen also focuses on building an innovation ecosystem and strengthening the integration and sharing of innovation resources. By building innovation carriers, optimising the innovation environment, improving innovation policies and other measures, Shenzhen has provided good conditions and guarantees for technological innovation and industrial development (Zhu & Tao, 2024). The implementation of these measures has not only improved Shenzhen's scientific and technological innovation capability and industrial competitiveness, but also laid a solid foundation for Shenzhen's sustainable development.

4.1.5 Environmental factors

(1) Environmental protection policies and regulations

As the frontier of China's reform and opening up, the formulation and implementation of environmental protection policies and regulations in Shenzhen not only reflect the city's emphasis on ecological environmental protection, but also its active participation in and contribution to global environmental protection issues. 62.79% of the participants believe that ecological environment and climate change have significant impacts on the industrial layout of Shenzhen, (Wei, Yin, Xia, Jiang, Ding & Luo, 2024) Shenzhen's system of environmental protection policies and regulations covers a wide range of environmental elements, such as air, water, soil and noise, and implements effective supervision and control of polluting enterprises through strict emission standards, an environmental impact

assessment system, and a sewage discharge permit system.

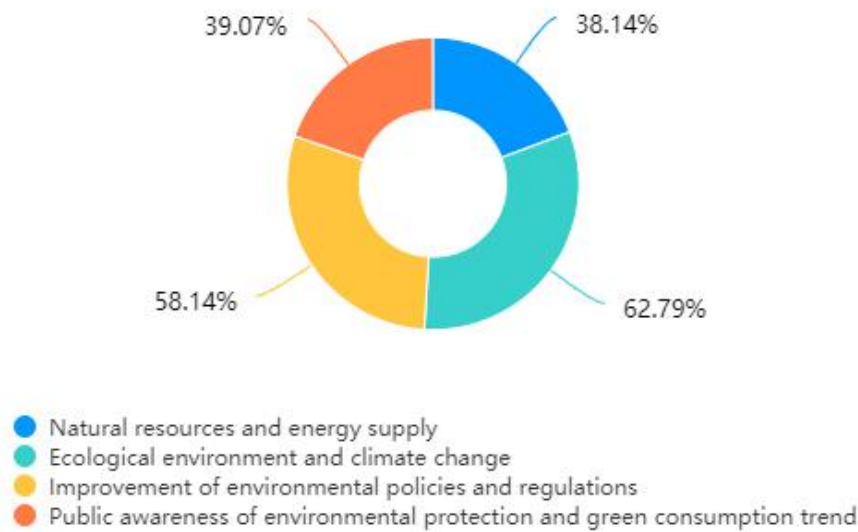


Figure 13 Questionnaire: Which environmental factors have a significant impact on the industrial layout of Shenzhen

In terms of industrial layout, Shenzhen's environmental protection policies and regulations play an important guiding role. On the one hand, by raising environmental protection standards and requirements, it has prompted the transformation and upgrading or elimination of high-polluting and high-energy-consuming industries, and promoted the adjustment of the industrial structure in the direction of greenness, low-carbon and environmental protection. (Ji, Cao, Bi, Zeng & Wang, 2024) On the other hand, through the provision of policy support and financial assistance, the development of green, environmentally friendly and low-carbon industries is encouraged to cultivate new economic growth points. This policy-guided adjustment of industrial layout not only helps to improve the quality of the

ecological environment, but also promotes the optimisation and upgrading of Shenzhen's industrial structure and enhances the city's sustainable development capability.

In addition, Shenzhen also pays attention to the innovation and practice of environmental policies, (Wang, Hu, Dai & Burns, 2021) such as carrying out the construction of the environmental credit system and the implementation of sewage trading, etc. These innovative initiatives not only improve the efficiency of the implementation of environmental policies, but also promote the transformation and upgrading of environmental management methods.

(2) Sustainable Development and Green Industry

In promoting the implementation of the sustainable development strategy, Shenzhen not only focuses on environmental protection and ecological construction, but also actively promotes the development and growth of green industries (Wei, Yin, Xia, Jiang, Ding & Luo, 2024). Green industry, as an important part of sustainable development, is characterised by low resource consumption, low environmental pollution and high economic benefits, and is an important force in promoting sustainable economic and social development.

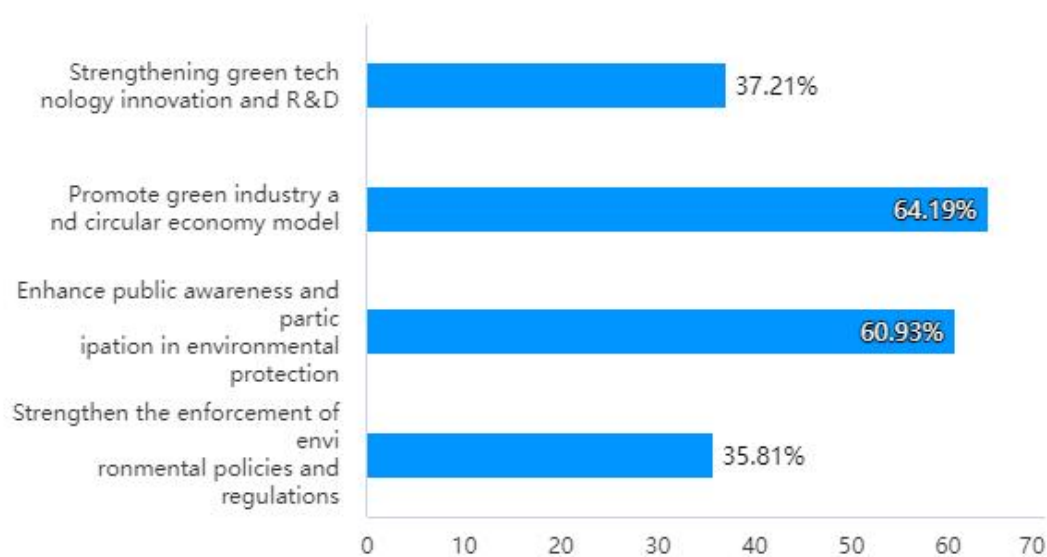


Figure 14 Questionnaire:How should Shenzhen play a leading role in promoting green development and optimising industrial layout

The development of green industries in Shenzhen is mainly reflected in the fields of clean energy, energy conservation and environmental protection, and new energy vehicles (Li, Ye, Liao, Ji & Ma, 2020). Through policy guidance and market mechanisms, Shenzhen encourages enterprises to increase R&D investment, promote technological innovation and industrial upgrading, and improve the market competitiveness of green products. (Sun, 2023)At the same time, Shenzhen also focuses on the construction and improvement of the green industry chain, and promotes the integration and development of green industry and traditional industry, forming a good situation of mutual promotion and common development of green industry and traditional industry. In terms of industrial layout, the development of green industry in Shenzhen not only optimises the industrial structure, but also promotes the rationalisation

of urban spatial layout. (Li & Zhao, 2023) Through rational planning of green industrial parks and green industrial clusters, Shenzhen guides the green industry to specific areas of agglomeration and development, forming a green industry cluster effect. This industrial agglomeration not only improves the efficiency of resource utilisation and reduces production costs, but also promotes technological innovation and industrial upgrading, and promotes the rapid development of green industries.

(3) Resource constraints and energy use

As a rapidly developing city, Shenzhen faces the challenges of resource constraints and energy utilisation. To cope with these challenges, Shenzhen has taken a series of measures to strengthen resource conservation and recycling and to improve the efficiency of energy utilisation.

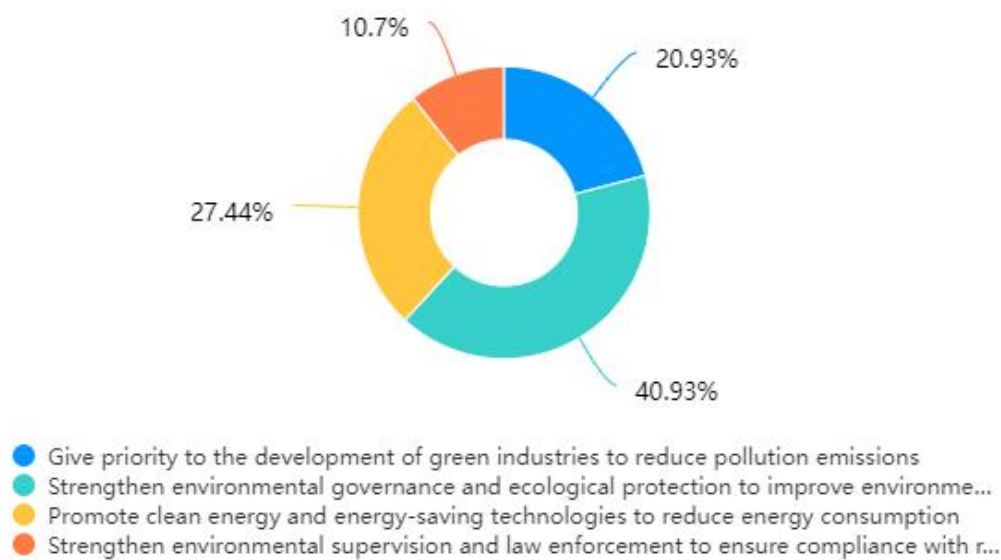


Figure 15 Questionnaire Survey: Shenzhen’s Measures to Balance Economic Development and Environmental Protection in Industrial Layout

In terms of resource conservation, Shenzhen focuses on improving resource utilisation efficiency and reducing resource wastage. By promoting the concept of circular economy and encouraging enterprises to strengthen resource recycling and waste resource utilisation, it has achieved the recycling and maximum utilisation of resources (Lin & While, 2022). At the same time, Shenzhen has also strengthened the supervision and management of resources, and established a comprehensive resource statistics and monitoring system, providing a strong guarantee for resource conservation and recycling.

In terms of energy utilisation, Shenzhen actively promotes the development and application of clean energy and reduces its reliance on fossil energy. Through the development of renewable energy sources such as wind and solar energy, the proportion of clean energy in the energy mix has been increased (Wang, Li, Wang, Deng, Wu & Hong, 2024). At the same time, Shenzhen also strengthens energy management and technological innovation, promotes the upgrading and transformation of energy utilisation technologies, and improves energy utilisation efficiency. In addition, Shenzhen also focuses on the optimisation and adjustment of the energy structure, and promotes the clean and efficient use of traditional energy sources such as coal and oil.

To meet the challenges of resource constraints and energy utilisation, Shenzhen has also strengthened international cooperation and exchanges (Shen & Wang, 2020). Through energy co-operation and technical exchanges

with advanced international cities, it has introduced advanced energy management and technical experience to promote the continuous improvement of Shenzhen's energy utilisation level.

4.1.6 Legal Factors

(1) Intellectual property protection and enterprise regulation operation

The importance Shenzhen attaches to intellectual property protection is reflected in the all-round, multi-level protection system it has constructed. This system not only covers traditional types of intellectual property rights such as patents, trademarks, copyrights, etc. (Cefalo, Nielsen, Boczy & Parma, 2020), but also gradually extends to emerging fields such as Internet copyrights, trade secrets, integrated circuit layout designs, etc., along with the development of science and technology. Through a variety of legislative, judicial and administrative means, Shenzhen has formed a strong IPR protection synergy, effectively curbed infringement and created a favourable environment for innovation under the rule of law.

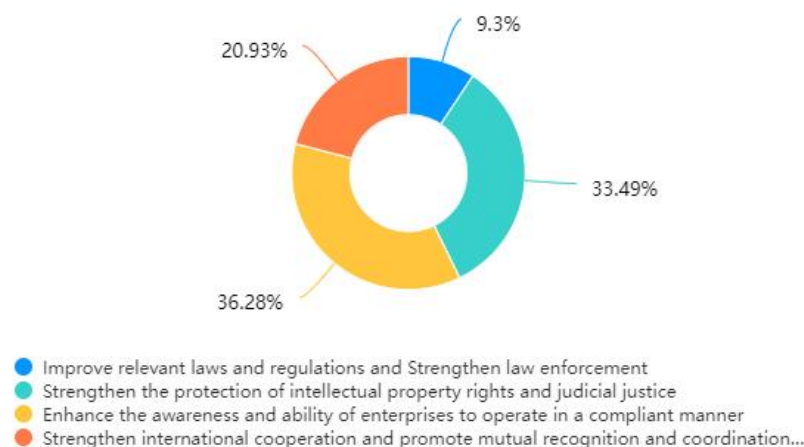


Figure 16 Questionnaire: How should Shenzhen strengthen legal protection and regulation in industrial layout?

33.49% of the participants stressed the importance of IPR protection, a proportion that not only reflects the deep understanding of the value of IPR by enterprises in Shenzhen's innovation ecosystem, but also maps out Shenzhen's unique position as an innovation centre. (Hu & Wang, 2020)

Intellectual property protection is not only the recognition and respect of innovation achievements, but also the key to stimulate innovation and promote industrial upgrading. Shenzhen by strengthening the enforcement of intellectual property rights, increase the penalties for infringement, effectively enhance the enthusiasm of the main body of innovation, promote the emergence of new technologies, new products, for Shenzhen and even the country's scientific and technological innovation has injected a strong impetus. It is worth noting that Shenzhen, in the protection of intellectual property rights, also pays special attention to the convergence with international rules, and actively participates in international intellectual property rights cooperation and exchanges, which enhances Shenzhen's discourse and influence in the global intellectual property rights governance (Huang, Guo, Shi & Ma, 2015). This international vision not only provides a strong legal guarantee for Shenzhen enterprises to 'go out', but also attracts more international innovation resources to Shenzhen, further promoting the international development of Shenzhen's innovation ecology.

(2) Market Access and Regulatory Policies

In the reform of market access system, Shenzhen has effectively reduced the

cost of enterprise establishment and operation and stimulated market vitality and social creativity by simplifying the approval process and optimising the business environment (Huang& Rohayah, 2024). This series of reform measures not only reflects Shenzhen's courage and determination as a reform pioneer, but also provides valuable experience for the nationwide reform of the market access system.

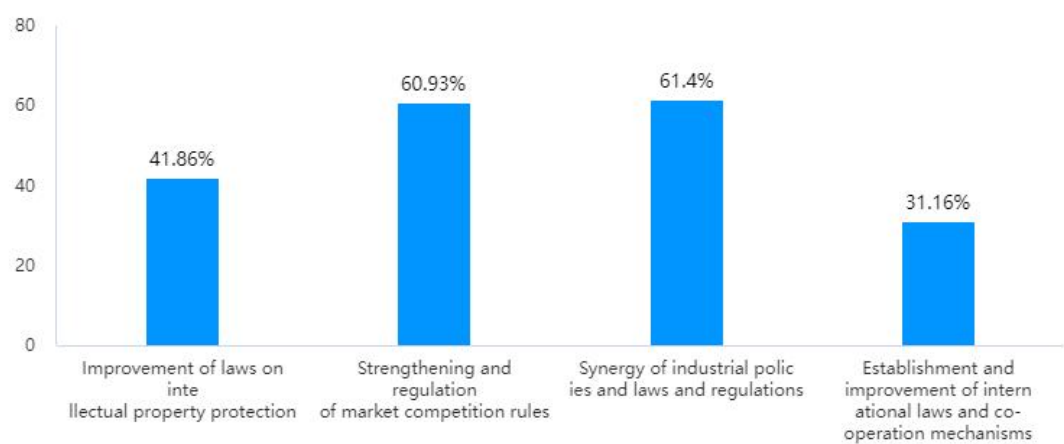


Figure 17 Questionnaire: Which legal factors have a significant impact on the optimisation of industrial layout in Shenzhen

61.4% of the participants agreed that the synergy between industrial policies and laws and regulations is important for the optimisation of industrial layout, which further proves Shenzhen's efforts in building a fair, transparent and predictable market environment. By formulating scientific industrial policies, Shenzhen has guided the concentration of resources towards advantageous industries and strategic emerging industries (He & Li, 2020). At the same time, it has strengthened market supervision and cracked down on unfair competition and illegal behaviours, maintaining the order of fair competition in

the market, and providing a strong guarantee for the healthy development of industries.

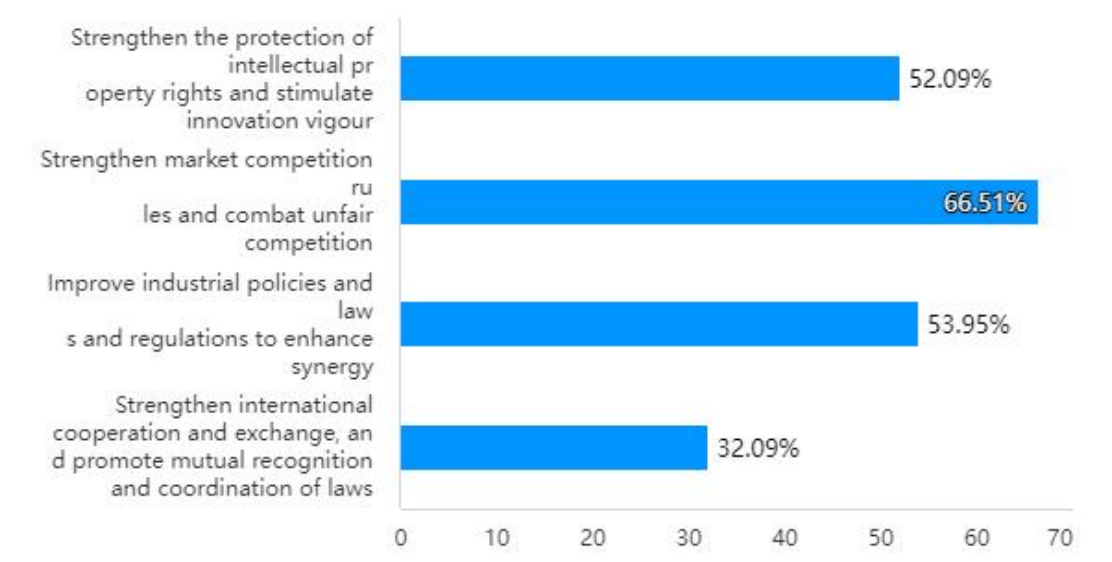


Figure 18 Questionnaire: In the face of legal challenges, how should Shenzhen adjust its industrial layout to maintain market order and fair competition

66.51% of the participants supported strengthening market competition rules and combating unfair competition, a proportion that reflects the strong demand for a fair competition environment among market participants in Shenzhen. By improving market competition rules and strengthening anti-monopoly and anti-unfair competition law enforcement, (Hu, Hu & He, 2021) Shenzhen has effectively curbed market monopoly and malicious competition behaviours, protected consumer rights and interests, and promoted the healthy and orderly development of the market.

In addition, in market supervision, Shenzhen also focuses on the use of big data, cloud computing and other modern information technology means to

enhance the effectiveness of supervision and realise precise supervision and efficient services for market entities (Demuynck, Zhang, Caset & Derudder, 2023). This kind of innovation in supervision not only improves the efficiency of supervision, but also enhances the sense of gain and satisfaction of market owners, providing strong support for Shenzhen to build a modern market supervision system.

4.2 Development of Strategic Emerging Industries

4.2.1 Development history

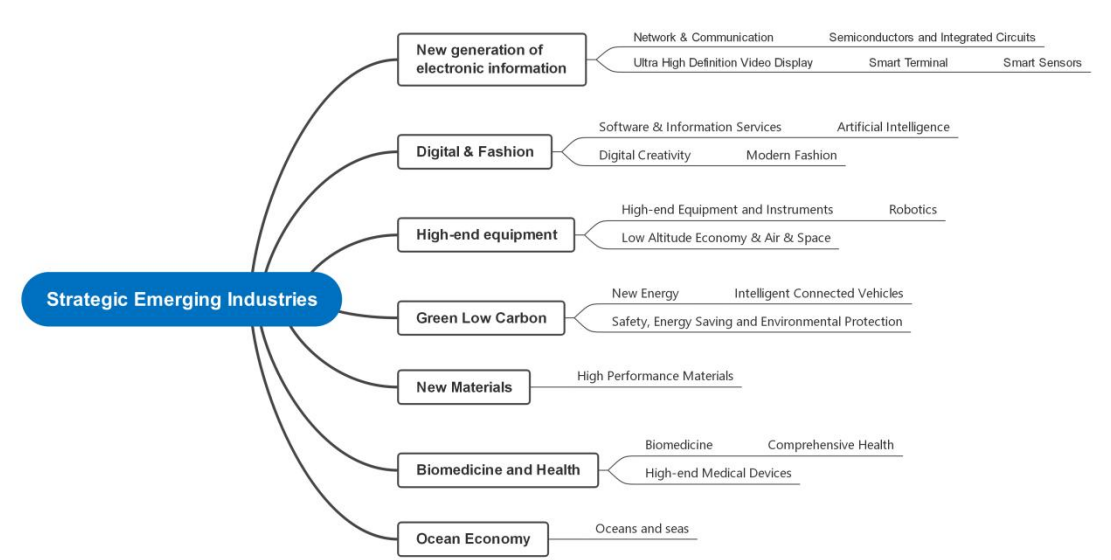


Figure 19 Layout of strategic emerging industries in Shenzhen

The development history of strategic emerging industries in Shenzhen is a vivid example of China's reform, opening up and modernisation, and its achievements are closely connected with the country's macro strategies. Since the early 1990s, (Chen, 2022) Shenzhen has rapidly grown into a global centre of electronic information industry by virtue of its unique geographical advantages, the open policy granted by the state and the forward-looking

innovation strategy. According to statistics, by the end of 2022, the output value of Shenzhen's electronic information industry had exceeded RMB 2.8 trillion, accounting for nearly 40% of the city's total industrial output value, of which smartphone production accounted for nearly 30% of the global market share, highlighting Shenzhen's core position in the global electronic information industry chain.

Shenzhen's development in the biomedical industry is also remarkable. Since the beginning of the 21st century, (Cheng, Chen & Tang, 2023) Shenzhen has embarked on the layout of biotechnology, new drug research and development, and high-end medical devices and other key areas, and gradually formed a biomedical industry ecosystem with distinctive characteristics and strong competitiveness by building international R&D platforms, attracting top scientific research talents, and deepening international cooperation. As of the first half of 2023, the number of biomedical enterprises in Shenzhen has exceeded 4000, of which the proportion of high-tech enterprises is more than 60%, forming a complete industrial system covering the whole chain of R&D, production and sales.

New energy and new materials industry, on the other hand, is an important layout of Shenzhen on the road to green transformation. From the breakthrough of solar photovoltaic technology, to wind energy, the rapid development of new energy vehicles, (Wang, Hu, Dai & Burns, 2021) Shenzhen not only promotes the optimisation and upgrading of its own

industrial structure, but also contributes to the global energy revolution and the progress of materials science 'Shenzhen wisdom'. By the end of 2023, Shenzhen has more than 500,000 new energy vehicles, accounting for nearly one-tenth of the national total (Li, Ye, Liao, Ji & Ma, 2020), becoming one of the cities with the highest penetration rate of new energy vehicles in the world. Meanwhile, Shenzhen has also made remarkable progress in the fields of photovoltaic materials and advanced composite materials, injecting new vigour into the development of the global new energy and new materials industry.

4.2.2 Analysis of Current Situation

At present, Shenzhen's strategic emerging industries have formed a complete industrial chain and highly concentrated industrial clusters covering R&D, manufacturing, sales and services. (Ma, Wang & Szmedra, 2019) As for the electronic information industry, Shenzhen is not only the global manufacturing centre for smartphones, tablet PCs and other intelligent terminal products, but also the core force leading the industry in technological innovation and standard setting. According to statistics, in 2023, the proportion of R&D investment in Shenzhen's electronic information industry to the output value has exceeded 5%, which is much higher than the national average, showing a strong innovation ability and technical strength.

As for the biomedical industry, Shenzhen is gradually becoming an international biomedical innovation highland by virtue of its leading advantages in gene sequencing, precision medicine and innovative drug development. By

the end of 2023, (Huang & Rohayah, 2024) Shenzhen's biomedical sector had won a total of more than 100 national science and technology awards, including many internationally leading innovations. In addition, Shenzhen biopharmaceutical enterprises have actively participated in international competition and cooperation, and have established extensive partnerships with a number of renowned pharmaceutical companies and research institutes around the world.

As for the new energy and new materials industry, Shenzhen's achievements in new energy vehicles, photovoltaic materials, advanced composite materials and other fields not only promote the green growth of the local economy, but also provide valuable experience for global energy transition and materials innovation. (Feng, 2024) By the end of 2023, the output value of Shenzhen's new energy and new materials industry had exceeded RMB 800 billion, accounting for nearly 10% of the city's total industrial output value, and becoming an important force driving Shenzhen's high-quality economic development.

4.2.3 Forecast of Future Trends

Looking ahead, Shenzhen's strategic emerging industries are ushering in unprecedented development opportunities. At the level of technological innovation, with the in-depth integration and application of cutting-edge technologies such as artificial intelligence, big data, cloud computing and the Internet of Things, Shenzhen's strategic emerging industries will accelerate

their transformation to intelligence, networking and servicing, giving rise to a series of new industrial forms and service models (Du, 2020). It is predicted that by 2025, the scale of Shenzhen's AI industry will reach RMB 300 billion, becoming an important global centre for AI innovation and application.

In terms of market demand, the sustained recovery of the global economy, changes in consumer preferences, and the society's pursuit of healthy, environmentally friendly and smart living will open up a broader market space for Shenzhen's strategic emerging industries. Especially in emerging fields such as new energy vehicles, smart homes, remote medical care, wearable devices, etc. (Cheng & Luo, 2023), Shenzhen enterprises are expected to occupy a more important position in the global market by virtue of their technological innovation capability and market acumen.

Meanwhile, in the face of uncertainties in the international trade environment, Shenzhen's strategic emerging industries will also pay more attention to the research and development of independently controllable core technologies, strengthen international co-operation, expand diversified markets, and embrace future challenges and opportunities with a more open and accommodating attitude (Chen, 2022). In the future, Shenzhen will continue to give full play to its leading position and innovation ability in the field of strategic emerging industries, and promote the sustainable and healthy development of strategic emerging industries in China and even in the world.

4.3 Future Industrial Development

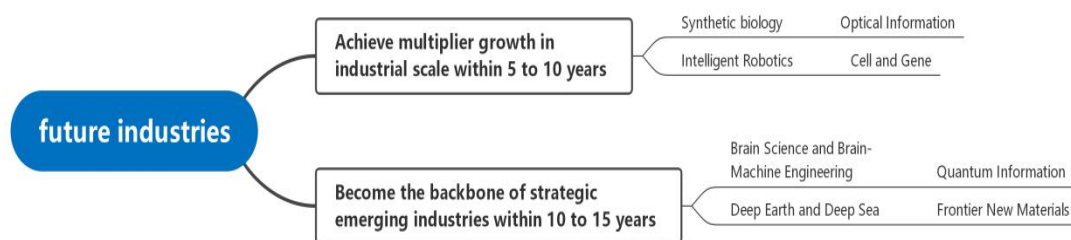


Figure 20 Layout of future industries in Shenzhen

4.3.1 Review of development history

The development history of Shenzhen's future industries is an important part of Shenzhen's innovation-driven development strategy, reflecting Shenzhen's strategic vision and forward-looking layout in global technological competition. Since the beginning of the 21st century, (Gao & Yi, 2021) Shenzhen has begun to layout synthetic biology, intelligent robotics, brain science and brain-computer engineering and other cutting-edge technology fields, and has gradually formed a relatively perfect industrial ecology and innovation system through the government-led, enterprise-led and market-oriented approach.

In recent years, Shenzhen has even taken quantum information, optical information, cells and genes, deep earth and deep sea, cutting-edge new materials and other future industries as the key development direction, and introduced a series of policies and measures, such as the 'Shenzhen Future Industry Development Plan (2021-2025)' and the '14th Five-Year Plan for Science and Technology Innovation in Shenzhen', which clearly define the development objectives, goals and objectives of the future industries, and the development of intelligent robots, brain science and brain-machine engineering. These policies have clearly defined the development objectives,

key tasks and safeguard measures for future industries (Jiang, Lai, Guo, Li, Hong & Tang, 2024). The introduction of these policies has provided strong institutional guarantee and policy support for the rapid development of future industries in Shenzhen.

According to statistics, by the end of 2023, (Jin, Yang, Zhu, Liang, Wang & Wang, 2024) the number of high-tech enterprises in the field of future industries in Shenzhen has exceeded 5000, including many unicorn enterprises and listed companies. These enterprises have made remarkable technological breakthroughs and market expansion in their respective fields, injecting a strong impetus for the development of Shenzhen's future industries.

4.3.2 Analysis of current situation

Currently, the development status of Shenzhen's future industries shows a booming trend. In the field of synthetic biology, Shenzhen has become one of the global hotspots for synthetic biology research, with a number of research institutions and enterprises with international influence. (Huang & Rohayah, 2024) According to statistics, in 2023, Shenzhen's patent applications in the field of synthetic biology accounted for nearly 30% of the national total, showing strong innovative capacity and technological strength.

In the field of intelligent robotics, Shenzhen has made remarkable progress in industrial robots and service robots, becoming one of the important robotics industry bases in the world. (Li, Kong, Lin, Zeng, Ke & Chen, 2024) In 2023, the output of industrial robots in Shenzhen accounted for nearly 20% of the

national total, and the size of the market for service robots has also continued to grow, providing broad market space for the development of the future industry in Shenzhen.

In the field of brain science and brain-computer engineering, Shenzhen has made important breakthroughs in the treatment of brain diseases and brain-computer fusion, providing new ideas and methods for the development of the global neuroscience field. (Quattrone & Chen, 2023) The number of brain science and brain-like intelligence research institutes in Shenzhen accounts for nearly 1/4 of the national total, showing Shenzhen's leading position in this field.

In the field of quantum information and optical-carrier information, Shenzhen has achieved remarkable results in quantum communication, quantum computing and optical communication, making significant contributions to the development of global information technology. (Wang, Li, Wang, Deng, Wu & Hong, 2024) 2023 Shenzhen's patent applications in the field of quantum information accounted for nearly 15% of the national total, and a number of technological breakthroughs and industrial applications have been made in the field of optical-carrier information.

In the field of cells and genes, Shenzhen has made important progress in gene sequencing and gene therapy, which has become a new hotspot for the development of the global biomedical industry. (Feng, 2024) In 2023, the amount of financing in the field of cell and gene therapy in Shenzhen

accounted for nearly 20% of the national total, demonstrating Shenzhen's strong development momentum in this field.

In the field of deep earth and deep sea, Shenzhen has achieved remarkable results in deep sea exploration and underground resources development, providing strong support for the sustainable development of global resources and environment (Hu, Hu & He, 2021). In the field of cutting-edge new materials, Shenzhen has made important breakthroughs in high-performance materials and smart materials, making significant contributions to the progress of global materials science.

In addition, Shenzhen has made remarkable achievements in intelligent manufacturing and digital economy. In the field of intelligent manufacturing, Shenzhen has promoted the development of manufacturing in the direction of intelligence and high-end through the introduction and independent research and development of advanced technologies. (Zhang, 2024) 2023, the number of intelligent manufacturing enterprises in Shenzhen accounted for nearly 10% of the national total, and the output value of intelligent manufacturing accounted for nearly 15% of the national total. As for the digital economy, the scale of Shenzhen's digital economy has continued to grow, and it has become one of the important digital economy centres in the country and even globally. in 2023, the added value of Shenzhen's core digital economy industries accounted for more than 30% of the city's GDP, showing the important role of the digital economy in the Shenzhen economy.

4.3.3 Future Prospects

Shenzhen's future industries have a bright future, but they also face many challenges. In terms of technological innovation, with the continuous breakthroughs and application expansion of cutting-edge technologies such as artificial intelligence, quantum information and blockchain, Shenzhen's future industries will usher in more technological innovations and application scenario expansion (Sun, 2023). However, the application of these technologies also faces challenges in terms of data security, privacy protection, ethics and morality. Therefore, Shenzhen needs to strengthen research on technological innovation and ethical norms to promote the healthy development of future industries.

In terms of changes in market demand, with the recovery of the global economy and the trend of consumption upgrading, Shenzhen's future industries will face broader market space and development opportunities. However, market competition is also becoming increasingly fierce, and enterprises need to continuously improve their core competitiveness and innovation ability (Dang & Li, 2023). Therefore, Shenzhen needs to strengthen the cultivation and enhancement of enterprises' innovation ability to promote the sustainable development of future industries.

At the same time, Shenzhen also needs to strengthen exchanges and co-operation with other countries and regions to jointly promote global scientific and technological innovation and development. By strengthening

international cooperation and exchanges, Shenzhen can introduce more international advanced technologies and talents to promote the international development of future industries (Cheng & Luo, 2023). In addition, Shenzhen can also actively participate in the reform and construction of the global science and technology governance system and contribute more wisdom and strength to global science and technology innovation and development.

4.4 Brief description of other advantageous industries

In addition to strategic emerging industries and future industries, Shenzhen also has a series of other advantageous industries. For example, Shenzhen's financial industry, logistics industry and cultural industry all have high competitiveness and influence.

4.4.1 Financial Industry

As an important part of the modern service industry, Shenzhen's financial industry has reached the international advanced level of development and influence. (Zhang, Sun & Meng, 2023) Shenzhen has a sound financial market system, covering a wide range of financial sectors such as banking, securities, insurance, funds, futures, trust and leasing, forming a multi-level and wide-coverage financial service network.

The core competitiveness of Shenzhen's financial industry lies in its strong innovation capability and in-depth services to the real economy. In recent years, Shenzhen financial institutions have continuously launched new products and services, such as intelligent investment advisors, blockchain

finance, green finance, etc., to meet the diversified needs of the market and promote the prosperous development of the financial market. (Huang, Guo, Shi & Ma, 2015) At the same time, Shenzhen's financial industry also focuses on serving the real economy, and helps the transformation, upgrading and high-quality development of real enterprises by providing a full range of financial services. For example, Shenzhen financial institutions actively support the development of science and technology innovative enterprises by providing these enterprises with comprehensive financial services such as financing support, risk management, wealth management, etc., and promoting the in-depth integration of science and technology innovation and financial innovation.

According to the latest data, by the end of 2023, (Zhu & Tao, 2024) the number of financial institutions in Shenzhen had exceeded 5000, of which the number of legal person financial institutions exceeded 300, and the added value of the financial industry accounted for more than 15% of the city's GDP, demonstrating the important position of the financial industry in Shenzhen's economy.

4.4.2 Logistics Industry

Shenzhen's logistics infrastructure is perfect, including seaports, airports, railways, roads and other modes of transport, forming an efficient and convenient logistics network. (Sun, 2023) The core competitiveness of Shenzhen's logistics industry lies in its efficient and convenient logistics

services and its ability to build a global logistics network. The throughput of Shenzhen's seaports, airports and other logistics hubs is among the highest in the country, providing high-quality logistics services for domestic and foreign enterprises. (Ma, Wang & Szmedra, 2019) At the same time, Shenzhen also actively promotes the international development of the logistics industry and strengthens its interconnection with the global logistics network. For example, Shenzhen seaports have established co-operative relationships with a number of ports around the world and opened a number of international routes, providing domestic and foreign enterprises with convenient maritime logistics services. Shenzhen airports have also actively expanded their international route networks and enhanced their air logistics services.

Shenzhen logistics actively uses advanced technologies such as Internet of Things, big data and artificial intelligence to improve the intelligence level of logistics services. For example, Shenzhen logistics enterprises have realised real-time tracking and accurate management of goods through the construction of intelligent warehousing systems, effectively improving logistics efficiency. Meanwhile, Shenzhen also actively promotes the development of green logistics, strengthens the recycling and treatment of logistics waste, and promotes the sustainable development of the logistics industry.

According to the latest data, by the end of 2023, (Feng, 2024) the added value of Shenzhen's logistics industry accounted for more than 10% of the city's GDP, showing the logistics industry's important position in Shenzhen's economy. At

the same time, the number of employees in Shenzhen's logistics industry has also continued to grow, providing important employment support for the city's economic development.

4.4.3 Cultural Industry



Figure 21 The 3A game 'Black Myth: Wukong' from Shenzhen, China

Shenzhen's cultural industry covers a wide range of fields such as creative design, film and media, animation and games, and cultural exhibitions, forming a diversified and multi-level cultural industry pattern. Shenzhen pays attention to the development of creative design and original content, and promotes the innovative development of the cultural industry through continuous excavation and integration of cultural resources. (Dang & Li, 2023) At the same time, Shenzhen cultural industry also pays attention to the integration and development with other industries, such as the deep integration with tourism,

science and technology industry and other industries, to promote the development of new forms and modes of cultural industry. For example, the number of global online players exceeded 1 million in just one hour after the launch. The 3A game 'Black Myth: Wukong' from Shenzhen, China, has swept the global game market with its stunning graphics and deep cultural heritage. The Guardian (UK), Bloomberg (US) and other media wrote in their reports on the game 'Black Myth: Wukong' that it is 'the most exciting and thrilling game of the summer', 'a whirlwind tour through the realm of the senses', 'made history on the first day of its official launch history and is on track to break the record for the number of simultaneous online players.'

According to the latest data, by the end of 2023, (Feng, 2024) the added value of Shenzhen's cultural industry accounted for more than 8% of the city's GDP, showing the important position of the cultural industry in Shenzhen's economy. Meanwhile, the number of employees in Shenzhen's cultural industry has also continued to grow, providing important employment support and talent security for the city's economic development. In the future, with the continuous development of Shenzhen's cultural industry and the improvement of its innovation ability, Shenzhen is expected to become one of the important centres of the global cultural industry.

5. The Contribution of Shenzhen's Regional Advantageous Industries to Economic Growth and the Path to Competitiveness Enhancement

5.1 Attraction Mechanism of Global Capital, Technology and Talents

5.1.1 Strategies and effectiveness of attracting foreign capital

As a special economic zone and innovation highland in China, Shenzhen's strategy for attracting foreign investment is not only limited to tax incentives and land supply, but also focuses on building an open and inclusive business environment, strengthening the protection of intellectual property rights, enhancing the efficiency of government services, and optimising the facilitation measures for foreign investment (Deng & Li, 2018). In recent years, Shenzhen has attracted a large amount of high-quality foreign investment through local regulations such as the Regulations on Foreign Investment in the Shenzhen Special Economic Zone, which have further relaxed market access and simplified the approval process for foreign investment.

In terms of effectiveness, by the end of 2023, (Ji, Cao, Bi, Zeng & Wang, 2024) Shenzhen had cumulatively set up more than 100,000 foreign-invested enterprises, and the actual amount of foreign investment used has ranked among the nation's top for many consecutive years. Among them, high-tech industries, advanced manufacturing and modern service industries have become the key areas of foreign investment, and local enterprises such as Huawei and Tencent have attracted a large amount of international capital to participate in their globalisation layout. In addition, the structure of foreign investment in Shenzhen has been continuously optimised, with more and more foreign capital invested in high value-added segments such as R&D and

design, high-end manufacturing and headquarters economy.

5.1.2 International technological cooperation and exchange

Shenzhen has actively integrated into the global science and technology innovation network, established scientific and technological cooperation relationships with many countries and regions, and participated in a number of international scientific and technological cooperation projects. For example, Shenzhen has deepened its cooperation in science and technology innovation with Israel and Singapore, and jointly set up a number of innovation centres and incubators, facilitating the introduction and integration of advanced technology and management experience.

Data show that in 2023, Shenzhen signed science and technology cooperation agreements with scientific research institutions, universities and enterprises in more than 50 countries and regions around the world, and introduced more than 100 international advanced technology projects (Deng & Chen, 2023), which effectively enhanced the technological innovation capability and international competitiveness of local enterprises.

5.1.3 Policies on the Introduction and Cultivation of High-end Talents

Shenzhen has implemented the 'Peacock Plan' and other plans for the introduction of high-end talents, and has provided high incentives, housing subsidies, children's education and other comprehensive support for the top talents and teams introduced from home and abroad. At the same time, Shenzhen has also increased its efforts to cultivate local talents, and provided

all-round protection for the growth of talents through the establishment of special funds for the development of talents and the construction of talent training bases, etc. By the end of 2023, the total number of talents introduced into Shenzhen was about 1.5 million (Luo & Liang, 2024).

By the end of 2023, Shenzhen has cumulatively introduced and trained more than 100,000 high-level talents, including many Nobel Prize winners, academicians and other top international talents (Zhu & Tao, 2024). The addition of these talents has injected a strong impetus into Shenzhen's scientific and technological innovation and industrial upgrading.

5.2 Empirical Analysis of Promoting Economic Growth

5.2.1 Quantitative analysis of economic growth

In recent years, Shenzhen's economy has continued to grow rapidly, and the GDP growth rate has always remained at the forefront of the country. In 2023, Shenzhen's GDP reached about RMB 3.2 trillion, a year-on-year growth of about 6.5%, higher than the national average. Among them, the value added of the tertiary industry accounted for more than 60%, becoming the main driving force of economic growth (Abdrabo, Mabrouk & Marzouk, 2024).

In terms of optimising the industrial structure, Shenzhen is actively promoting the development of high-tech industries, and strategic emerging industries such as electronic information, biomedicine and new energy continue to grow. In 2023, the output value of Shenzhen's high-tech industries will exceed RMB 3 trillion, an increase of about 8% year-on-year, and account for more

than 60% of the city's total industrial output value (Luo & Liang, 2024).

5.2.2 Assessment of the contribution of dominant industries to economic growth

Shenzhen's dominant industries contribute significantly to economic growth. Taking the electronics and information industry as an example, the output value of Shenzhen's electronics and information industry will reach approximately RMB 2.5 trillion in 2023, with a year-on-year growth of approximately 7.5%, accounting for more than 40% of the city's total industrial output value. In addition, emerging industries such as biomedicine and new energy are also showing rapid growth and increasing contribution to economic growth.

The development of these advantaged industries not only drives the synergistic development of enterprises upstream and downstream of the relevant industrial chain, but also promotes the growth of employment and tax revenue. According to statistics, in 2023, Shenzhen's advantaged industries will provide more than 5 million jobs, providing strong support for the city's economic development (Zhu & Tao, 2024).

5.3 Specific paths to enhance the city's competitiveness

5.3.1 Policy support system

Shenzhen continuously improves its policy support system, providing enterprises with all-round support and assistance through tax incentives, financial support, industrial planning and other measures. For example,

Shenzhen gives tax incentives such as income tax reduction and exemption and additional deduction for R&D expenses to qualified high-tech enterprises; establishes special funds for industrial development to support technological innovation and industrial upgrading of enterprises; and formulates industrial development plans to guide the rational layout and synergistic development of industries.

In addition, Shenzhen is actively building a new open economic system and promoting the liberalisation and facilitation of trade and investment. In 2023, Shenzhen's total import and export volume will reach about RMB 3.5 trillion, an increase of about 5% year-on-year, with exports of high-tech products accounting for more than 50% of the total (Abdrabo, Mabrouk & Marzouk, 2024).

5.3.2 Market Opening and International Co-operation

Shenzhen actively promotes market opening and international cooperation to enhance the city's international competitiveness and influence through the construction of pilot free trade zones and participation in international economic cooperation projects.

With regard to the pilot free trade zones, Shenzhen Qianhai Shekou Pilot Free Trade Zone, as one of the first batch of pilot free trade zones in China, has achieved remarkable results in terms of system innovation, trade facilitation, and financial liberalisation. (Luo & Liang, 2024) By the end of 2023, the cumulative number of enterprises registered in Qianhai Shekou FTZ exceeded

180,000, and the amount of actual utilised foreign capital exceeded US\$100 billion.

In terms of international cooperation projects, Shenzhen actively participates in the 'Belt and Road' Initiative, international production capacity cooperation and other international cooperation projects, and carries out exchanges and cooperation in the fields of economy, trade, science and technology, culture and other areas with countries and regions along the route. (Cheng & Luo, 2023) By 2023, the trade volume between Shenzhen and countries and regions along the 'Belt and Road' will reach about RMB 1 trillion, with a year-on-year growth of about 10%.

5.3.3 Innovation-driven development strategy

Shenzhen adheres to the innovation-driven development strategy, and promotes the city's innovation capability and technology level through measures such as strengthening the construction of innovation platforms and promoting the transformation of scientific and technological achievements.

With regard to the construction of innovation platforms, Shenzhen has strengthened its support for research institutes, universities and enterprises, and promoted cooperation among industries, universities and research institutes as well as the synergistic development of the innovation chain. By the end of 2023, Shenzhen had more than 100 national-level innovation platforms and more than 500 provincial-level innovation platforms, forming a relatively complete innovation system (Zhu & Tao, 2024).

As for the transformation of scientific and technological achievements, Shenzhen has established a perfect mechanism and service system for the transformation of scientific and technological achievements, providing strong guarantee and support for the transformation and application of scientific and technological achievements. (Feng, 2024) In 2023, Shenzhen ranked first in the country in terms of the number of patents applied for and authorised, with more than 50% of which were invention patents applied for and authorised, showing Shenzhen's strong innovation ability and scientific and technological strength.

Shenzhen's regionally advantaged industries contribute significantly to economic growth, and the city's competitiveness continues to improve. In the future, Shenzhen will continue to deepen reform and opening up, strengthen policy support, market opening and international cooperation as well as the implementation of the innovation-driven development strategy, so as to promote the city's sustainable development and prosperity.

6. Implications and Replicability Analysis of Shenzhen Experience for Other Cities

6.1 Summary of Successful Experiences

6.1.1 Innovation in Government Role and Governance Model

With its forward-looking vision and efficient execution, the Shenzhen government has successfully realised innovation in government role and governance mode. The government has not only acted as a rule maker and

market regulator, but has also become a service provider and facilitator, providing a favourable development environment for the market and enterprises. Through a series of initiatives such as streamlining the administrative approval process, improving service efficiency and optimising the business environment, the Shenzhen government has successfully attracted a large number of domestic and foreign enterprises and investors.

In addition, the Shenzhen government actively promotes policy innovation and system supply, introducing and adjusting relevant policies in a timely manner according to market changes and industrial development needs (Dang & Li, 2023). For example, in order to support the development of high-tech industries, the Shenzhen government has introduced a series of tax breaks, financial subsidies and other policies to provide strong support for high-tech enterprises. These policies have not only facilitated the rapid development of enterprises, but also promoted the continued prosperity of the Shenzhen economy.

In recent years, Shenzhen has achieved remarkable results in reforming its business environment. (Cefalo, Nielsen, Boczy & Parma, 2020) According to the Global Doing Business Report released by the World Bank, Shenzhen's business environment ranking has improved year by year and has been among the top in the world. This is not only due to the efforts of the government, but also the active participation of the market and enterprises.

6.1.2 Synergy between industrial layout and urban planning

Shenzhen has achieved a high degree of synergy between industrial layout and urban planning, providing strong support for economic development. Shenzhen focuses on the development of advanced manufacturing and modern service industries to build a modern industrial system. Through scientific planning and rational layout, Shenzhen has successfully created a number of industrial parks and industrial clusters, forming a competitive industrial chain.

In terms of urban planning, Shenzhen focuses on enhancing the 'intensive degree' of urban development, strengthening infrastructure construction and improving the comprehensive carrying capacity of the city (Li, Chen & Grant, 2021). By optimising the transport network, upgrading public facilities and improving the ecological environment, Shenzhen has successfully created a livable and workable urban environment. These measures have not only improved the quality of life of city residents, but also attracted a large number of talents and enterprises to the city.

According to Chinese government statistics, Shenzhen maintains a leading position in the country in terms of gross industrial output value and value added of industry. At the same time, Shenzhen's capacity for science and technology innovation has continued to grow, and it has become one of the world's important science and technology innovation centres.

6.1.3 Construction of Innovation and Entrepreneurship Ecosystems

Shenzhen's innovation and entrepreneurship ecosystem is one of the keys to

its success. The government has provided a favourable environment and conditions for innovation and entrepreneurship by providing policy support, financial support, talent protection and other measures (Luo & Shen, 2022). Shenzhen has a comprehensive innovation and entrepreneurship service system, including incubators, accelerators and venture capital funds, which provides start-ups with all-round support and assistance.

Specifically, Shenzhen has many well-known innovation and entrepreneurship parks and incubators, such as Shenzhen Bay Venture Capital Building and Nanshan Science and Technology Park. These parks and incubators not only provide good development space and resource support for startups, but also promote the gathering and exchange of innovative and entrepreneurial talents. (Zhu & Tao, 2024) According to the latest data, the number of incubators in Shenzhen has exceeded 200, with a cumulative total of more than 10,000 incubatees.

In terms of financial support, the number and scale of venture capital funds in Shenzhen continue to expand. By the end of 2023, the number of VC funds in Shenzhen had exceeded 5,000, and the scale of funds under management had exceeded 1 trillion yuan, according to the Shenzhen Finance Office (Jin, Yang, Zhu, Liang, Wang & Wang, 2024). These VC funds have provided strong financial support to start-ups and promoted the sustainable development of innovation and entrepreneurship activities.

In addition, Shenzhen also focuses on the cultivation and introduction of

innovation and entrepreneurship talents. Through measures such as setting up innovation and entrepreneurship talent bases and organising innovation and entrepreneurship competitions, Shenzhen has successfully attracted and nurtured a number of talents with innovative spirit and entrepreneurial ability. (Feng, 2024) According to the latest data, the number of innovation and entrepreneurship talents in Shenzhen has exceeded 500,000, of which high-level talents account for more than 20%.

6.2 Adaptive Learning in Other Cities

6.2.1 Adaptive Strategies in Different City Contexts

When learning from Shenzhen's experience, different cities need to adopt adaptive strategies in the light of their own actual situation and market demand. For example, resource-based cities can learn from Shenzhen's experience in industrial upgrading and transformation to achieve sustainable economic development through measures such as developing new industries and improving resource utilisation efficiency. At the same time, resource-based cities can also focus on the protection and governance of the ecological environment and promote green development.

Famous historical and cultural cities can focus on the protection and inheritance of history and culture, and at the same time promote the integration of culture and industry by combining the needs of modern urban development (Dang & Li, 2023). By tapping into historical and cultural resources and building cultural and tourism brands, historical and cultural cities can attract

more tourists and investors and promote rapid economic development.

Emerging cities, on the other hand, can learn from Shenzhen's experience in innovation and entrepreneurship and urban planning to create city brands and industrial systems with characteristics and competitiveness. By optimising the business environment and attracting talents and enterprises, emerging cities can quickly rise to become new stars of economic development.

6.2.2 Implementation Path and Challenges of Learning from Shenzhen Experience

Learning from the Shenzhen experience requires clear implementation paths and challenges. In terms of implementation path, it can start from policy innovation, industrial planning, urban planning, innovation and entrepreneurship, etc., and gradually promote reform and development. At the same time, there is a need to strengthen communication and collaboration between the government and various parties, including the market, enterprises and society, to form a synergy to promote urban development.

In addressing the challenges, it is necessary to fully consider the actual situation and market demand of different cities and avoid blindly copying the Shenzhen experience (He & Li, 2020). For example, some inland cities, when learning from Shenzhen's experience, need to focus on the development of industries suitable for their own conditions, and avoid over-reliance on new industries while neglecting the transformation and upgrading of traditional industries. At the same time, it is also necessary to strengthen the construction

of risk prevention, control and response mechanism, and timely resolution of possible risks and problems.

In addition, drawing on the experience of Shenzhen also needs to focus on innovation and sustainable development. Shenzhen's successful experience is based on continuous innovation and sustainable development. Therefore, other cities need to focus on innovation and sustainable development when learning from Shenzhen's experience, so as to promote sustained economic prosperity and comprehensive urban upgrading.

6.2.3 Case Studies: Lessons from Successes and Failures

(1) Successful Case: Hangzhou

As a famous historical and cultural city and an emerging city, Hangzhou has achieved remarkable results in learning from Shenzhen's experience. Hangzhou focuses on policy innovation and system supply, and has attracted a large number of innovative and entrepreneurial talents and enterprises by introducing a series of supportive policies (Gao & Yi, 2021). At the same time, Hangzhou also focuses on the synergistic development of urban planning and industrial layout, creating an industrial system with the digital economy at its core. These measures have not only promoted the rapid development of Hangzhou's economy, but also improved the city's competitiveness and influence.

According to Hangzhou's latest government work report, Hangzhou's digital economy has become an important engine for driving economic growth.

Through the development of e-commerce, cloud computing, big data and other emerging industries, Hangzhou has successfully created a number of enterprises and brands with international influence. At the same time, Hangzhou also focuses on upgrading its urban quality and ecological environment, becoming a modern city that is pleasant to live and work in.

(2) Failure Cases: Some Backward Cities

When some backward cities learnt from the Shenzhen experience, they blindly copied the Shenzhen experience because they failed to fully consider their own actual situation and market demand, which led to some problems. For example, when promoting industrial upgrading and transformation, some cities pay too much attention to the development of new industries and neglect the transformation and upgrading of traditional industries; some cities pay too much attention to image projects and neglect the improvement and upgrading of urban functions when promoting urban planning. These problems not only affect the sustainable development of cities, but also waste a lot of resources and funds.

In order to avoid similar problems, some backward cities need to focus on combining their own actual situation and market demand to formulate scientific and reasonable policies and plans when learning from the experience of Shenzhen (Jin, Yang, Zhu, Liang, Wang & Wang, 2024). At the same time, they also need to strengthen the construction of risk prevention, control and response mechanisms, so as to resolve possible risks and problems in a

timely manner. In addition, they can also draw on the lessons learnt from other successful cases and carry out innovative development in the light of their own characteristics.

7. Conclusions and Recommendations

7.1 Summary of the Study

Through an exhaustive examination of the development history of the Shenzhen Special Economic Zone, this study finds that its outstanding performance in the transformation of the role of the government, industrial innovation and upgrading, and the creation of an innovative and entrepreneurial environment provides valuable reference for other cities. Through a series of policy innovations, such as the implementation of 'Internet+Government Services', the Shenzhen government has shortened the time for business registration from an average of 22 working days to 0.5 working days now (Jiang, Lai, Guo, Li, Hong & Tang, 2024), which has greatly improved administrative efficiency and created a favourable business environment.

In terms of industry, Shenzhen has successfully constructed high-tech industry clusters represented by electronic information, biomedicine, new energy, new materials, artificial intelligence, etc. The contribution rate of these industries to GDP has exceeded 75%, and the average annual growth rate has remained above 10% (Luo & Liang, 2024). In particular, the electronic information industry has become a globally important manufacturing base and R&D centre

for electronic information products, with its output value accounting for more than 40% of the city's total industrial output value (Wei & Zhang, 2024). Meanwhile, Shenzhen has also created a number of industrial parks with international influence through the close integration of urban planning and industrial policies, such as Shenzhen Bay Science and Technology Eco-Park and Qianhai Shenzhen-Hong Kong Modern Service Industry Co-operation Zone, etc. These parks not only promote upstream and downstream integration of the industrial chain and synergistic innovation, but also drive the economic development of the surrounding areas.

In terms of innovation and entrepreneurship, Shenzhen has the largest number of state-level high-tech enterprises and incubators in the country, with a cumulative total of more than 60,000 incubated enterprises, including many world-renowned enterprises such as Huawei, Tencent and DJI. (Zhu & Tao, 2024) Shenzhen has also set up innovation and entrepreneurship investment funds totalling more than 150 billion yuan, providing strong financial support for start-ups. In addition, Shenzhen has created a strong innovation and entrepreneurship atmosphere by organising various innovation and entrepreneurship competitions, forums and other activities, attracting a large number of domestic and foreign talents to come to entrepreneurship and development. According to statistics, Shenzhen's patent applications and authorisations have ranked among the top in the country for many consecutive years, with invention patent applications accounting for more than 50% of the

total.

By comparing and analysing the development experience of other cities, I found that although the successful experience of Shenzhen is universal, it needs to be differentiated and adjusted with the resource endowment, development stage and policy environment of each city in the process of concrete implementation.

7.2 Policy Recommendations

7.2.1 Policy Innovation and System Supply

It is recommended that the government continue to deepen the 'release of administrative services' reform, optimise the process of government services and improve administrative efficiency. Specific measures include: shortening the time for business start-up to less than 0.5 working days; implementing 'one network for all' to achieve full coverage of online processing of government services; strengthening intellectual property protection, establishing a rapid response mechanism, and shortening the average processing time for patent infringement cases to less than 2 months. At the same time, financial support for innovative enterprises has been increased, such as the establishment of a special fund to support the transformation of scientific and technological achievements and the development of start-ups, with the aim of doubling the number of innovative enterprises in the next five years.

7.2.2 Synergy between industrial layout and urban planning

The government should formulate a clear industrial development plan, focusing on high-end manufacturing, modern service industries and strategic emerging industries, and promote the optimisation and upgrading of industrial structure. Specific measures include: strengthening the construction of industrial parks, improving the efficiency of land use, and striving to expand the area of industrial parks to more than twice their original size in the next five years; promoting the synergistic development of upstream and downstream industrial chains, and forming a number of globally competitive industrial clusters; and strengthening the convergence between urban planning and industrial policies, promoting the integration and development of industrial parks with neighbouring communities, and upgrading the functions and livability of cities.

7.2.3 Improvement of Innovation and Entrepreneurship Ecosystem

It is recommended that the government increase financial investment and policy support for innovation and entrepreneurship. Specific measures include: setting up a special fund to support the development of innovation and entrepreneurship projects, and striving to expand the scale of the innovation and entrepreneurship investment fund to more than RMB 200 billion in the next five years; strengthening the construction of the innovation and entrepreneurship education and training system, and fostering more talents with innovation and entrepreneurship and practical ability; organising various types of innovation and entrepreneurship competitions, forums and other

activities, so as to create a strong atmosphere of innovation and entrepreneurship; and strengthening cooperation and exchanges with internationally renowned innovation and entrepreneurship institutions, and introduce more international high-quality innovation and entrepreneurship resources.

7.2.4 Regional cooperation and collaborative development

Encourage Shenzhen to establish closer cooperation with neighbouring cities (Zhang, Shen & Gao, 2021), and work together to create a new model of regional industrial synergistic development. Specific measures include: strengthening the construction of regional transport infrastructure and improving regional connectivity; promoting the synergistic development of regional industries and forming a number of globally competitive industrial clusters; strengthening regional cooperation and exchanges in scientific and technological innovation, and working together to build an international scientific and technological innovation centre; and strengthening regional cooperation in ecological environmental protection and governance, and promoting regional green development.

7.2.5 Risk Prevention, Control and Response Mechanisms

Establish and improve the risk early warning and emergency management mechanism, and strengthen the monitoring and assessment of risks in terms of economic fluctuations, industrial transformation and social stability. Specific measures include: establishing a risk early warning system to monitor and

analyse various types of risk information in real time; formulating an emergency plan and disposal process to ensure rapid response and effective disposal when emergencies occur; and strengthening the construction of inter-departmental coordination and cooperation and information-sharing mechanisms to improve the ability and efficiency of responding to emergencies.

7.3 Future Research Direction

7.3.1 Deepen theoretical research and data analysis

Use big data analysis, artificial intelligence and other advanced technologies to conduct in-depth mining and analysis of the economic development data of Shenzhen and other successful cities to reveal the economic laws and successful experiences behind them (Sun, 2023). Specific measures include: establishing economic development databases and data platforms to collect and analyse all kinds of economic data and information; using technical means such as data mining and machine learning to conduct in-depth excavation and analysis of economic development data; and combining economic theories and methods to interpret and explain the data, so as to build a more scientific and systematic urban development theory system.

7.3.2 Expand Case Studies and Comparative Analysis

Select more representative cities at home and abroad as research objects, and provide more cities with useful reference and inspiration through comparative analyses of their successful experiences and development

modes. Specific measures include: strengthening research and analysis efforts on successful cities at home and abroad; establishing a case bank and a case database to collect and collate all kinds of successful cases and data information; conducting in-depth studies and analyses on the successful experiences and development models of different cities by applying comparative analyses and other methods; and proposing targeted policy recommendations and development strategies in the light of the actual situation and the market demand.

7.3.3 Application and Innovation of Interdisciplinary Research Methods

Combine the theories and methods of economics, management, urban planning, sociology and other disciplines to build an interdisciplinary research framework and model. Specific measures include: increasing interdisciplinary cooperation and exchanges; establishing interdisciplinary research teams and platforms; applying multidisciplinary theories and methods to conduct in-depth research and analyses on urban development issues; and promoting the transformation and application and promotion of interdisciplinary research results.

7.3.4 Focus on the impact of emerging fields and trends

Strengthen research and analysis efforts on emerging fields such as digital economy, artificial intelligence, green economy, etc., and explore their impacts and challenges on the city's industrial structure, employment structure and urban planning. Specific measures include: establishing a database and data

platform for the development of emerging fields, collecting and analysing all kinds of data and information on emerging fields; strengthening the monitoring and analysis of development trends and the policy environment of emerging fields; proposing targeted policy recommendations and development strategies in the light of the actual situation and market demand; and promoting the integration and development of emerging fields with traditional industries.

7.3.5 Long-term tracking research and policy evaluation

Establish a long-term tracking research mechanism to continuously monitor and evaluate the effects and impacts of policy implementation. Specific measures include: setting up a policy evaluation database and data platform, collecting and analysing various types of policy evaluation data and information; conducting in-depth studies and analyses on the effects of policy implementation by using quantitative and qualitative analysis and other methods; proposing targeted policy recommendations and improvement measures in the light of the actual situation and market demand; and promoting the transformation and application of policy evaluation results.

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9. Appendices

9.1 Content of the questionnaire

Survey on the layout and development status of industries with regional advantages in Shenzhen

* 1.What is your age group?

- ☐ 18~25 ☐ 26~30 ☐ 31~35 ☐ 36~40
☐ 41~50 ☐ 51~60 ☐ 60+

* 2.What is your current occupation?

- ☐ Professionals: such as experts and scholars, teachers, doctors, lawyers, engineers, etc.
☐ Freelancers: such as writers, artists, photographers, tour guides, etc.
☐ Workers: such as factory workers, construction workers, urban sanitation workers, etc.
☐ Staff of institutions, state-owned enterprises, government and social organisations.
☐ Senior managers of enterprises, such as enterprise CEO, CTO, COO, etc.
☐ Students

* 3.What do you think are the most crucial current national policy supports for Shenzhen to facilitate the optimisation of its industrial layout?

- ☐ Tax incentives and financial subsidies
☐ Science and Technology Innovation and Industrial Upgrading Policies
☐ International Trade and Co-operation Policies
☐ Policies on regional co-development

* 4.Which of the following national policies do you think has had the most significant impact on Shenzhen's industrial layout?

- ☐ Policies on technological innovation and industrial upgrading in the 14th Five-Year Plan
☐ Regional synergies brought about by the Guangdong-Hong Kong-Macao Greater Bay Area Development Plan
☐ Nationally owned contribution targets for climate change
☐ Opportunities for international co-operation brought about by the 'Belt and Road' Initiative

* 5.In the face of international economic uncertainty, how should Shenzhen adjust its industrial layout to meet the challenges?

- ☐ Strengthening international cooperation and expanding overseas markets
☐ Deepen domestic cooperation and optimise the regional industrial chain
☐ Increase independent innovation and enhance core competitiveness
☐ Strengthen policy guidance to ensure stable development of the industry

* 6.Which industrial sector in Shenzhen has the most growth potential in the current global economic situation?

- ☐ High-end Manufacturing
- ☐ Future Technology
- ☐ Digital Economy
- ☐ Green Building and Environmental Industry

* 7.Which of the following economic factors do you think has the most significant impact on the industrial layout of Shenzhen?

- ☐ Changes in domestic and international market demand
- ☐ Capital flow and investment decision
- ☐ Technological innovation and industrial upgrading
- ☐ International trade and cooperation environment

* 8.In the face of economic downward pressure, how should Shenzhen adjust its industrial layout to stimulate economic growth?

- ☐ Increase investment in infrastructure construction
- ☐ Promote consumption upgrade and expand domestic demand
- ☐ Support small and medium-sized enterprises and entrepreneurship and innovation
- ☐ Optimise industrial structure and increase value-added

* 9.What do you think is the biggest impact of the demographic changes in Shenzhen on the industrial layout?

- ☐ Changes in supply and demand in the labour market
- ☐ Diversified demand in the consumer market
- ☐ Enhancement of innovation and entrepreneurial atmosphere
- ☐ Improvement of public services and infrastructure

* 10.Which of the following social factors do you think have an important influence on the industrial layout of Shenzhen?

- ☐ Education level and talent supply
- ☐ Quality of life and consumption habits of residents
- ☐ Social culture and values
- ☐ Public safety and social governance

* 11. In promoting industrial upgrading and layout optimisation, how should Shenzhen make full use of its social resource advantages?

- ☐ Strengthen the cultivation and introduction of talents
- ☐ Enhance the level of public services and optimise the business environment
- ☐ Encourage innovation and entrepreneurship to stimulate market vitality
- ☐ Strengthen social governance and ensure social stability

* 12. What do you think is the most disruptive potential technology in the current industrial layout of Shenzhen?

- ☐ Artificial Intelligence and Big Data
- ☐ 5G Communication and Internet of Things
- ☐ Blockchain and digital currency
- ☐ Biotechnology and gene editing

* 13. Which of the following technological factors do you think are critical to the optimisation of Shenzhen's industrial layout?

- ☐ Enhancement of technological innovation and R&D capability
- ☐ Acceleration of technological achievement transformation and industrialisation application
- ☐ Protection of technical standards and intellectual property rights
- ☐ Introduction and cultivation of technical talents and teams

* 14. How should Shenzhen adjust its industrial layout to seize opportunities in the face of technological changes?

- ☐ Increase investment in R&D to promote technological innovation
- ☐ Promote the transformation of technological achievements to accelerate industrial upgrading
- ☐ Strengthen the training and introduction of technical talents to enhance competitiveness
- ☐ Optimise the technological ecological environment to attract innovative resources

* 15. How do you think Shenzhen should balance the relationship between economic development and environmental protection in its industrial layout?

- ☐ Give priority to the development of green industries to reduce pollution emissions
- ☐ Strengthen environmental governance and ecological protection to improve environmental quality
- ☐ Promote clean energy and energy-saving technologies to reduce energy consumption
- ☐ Strengthen environmental supervision and law enforcement to ensure compliance with regulations

* 16. Which of the following environmental factors do you think have an important influence on the industrial layout of Shenzhen?

- ☐ Natural resources and energy supply
- ☐ Ecological environment and climate change
- ☐ Improvement of environmental policies and regulations
- ☐ Public awareness of environmental protection and green consumption trend

* 17. How should Shenzhen play a leading role in promoting green development and optimising industrial layout?

- ☐ Strengthening green technology innovation and R&D
- ☐ Promote green industry and circular economy model
- ☐ Enhance public awareness and participation in environmental protection
- ☐ Strengthen the enforcement of environmental policies and regulations

* 18. How do you think Shenzhen should strengthen legal protection and supervision in industrial layout?

- ☐ Improve relevant laws and regulations and Strengthen law enforcement
- ☐ Strengthen the protection of intellectual property rights and judicial justice
- ☐ Enhance the awareness and ability of enterprises to operate in a compliant manner
- ☐ Strengthen international cooperation and promote mutual recognition and coordination of laws

* 19. Which of the following legal factors do you think have an important influence on the optimisation of industrial layout in Shenzhen?

- ☐ Improvement of laws on intellectual property protection
- ☐ Strengthening and regulation of market competition rules
- ☐ Synergy of industrial policies and laws and regulations
- ☐ Establishment and improvement of international laws and co-operation mechanisms

* 20. In the face of legal challenges, how should Shenzhen adjust its industrial layout to maintain market order and fair competition?

- ☐ Strengthen the protection of intellectual property rights and stimulate innovation vigour
- ☐ Strengthen market competition rules and combat unfair competition
- ☐ Improve industrial policies and laws and regulations to enhance synergy
- ☐ Strengthen international cooperation and exchange, and promote mutual recognition and coordination of laws

9.2 Shenzhen Investment Policies

Foreign Investment Law of the People's Republic of China | 2024-11-05

The Foreign Investment Law of the People's Republic of China, adopted at the Second Session of the 13th National People's Congress on March 15, 2019, is hereby promulgated for implementation as of January 1, 2020.

Operating Procedures for Funding the Parallel-import Automobiles Supporting Program by Special Funds | 2019-12-02

The Operating Procedures of the Commerce Bureau of Shenzhen Municipality for Funding the Parallel-import Automobiles Supporting Program by Special Funds, as formulated by the Commerce Bureau of Shenzhen Municipality, are hereby issued t...

Issuance of the Special Administrative Measures (Negative List) for the Access of Foreign Investment (2019) | 2019-11-28

The Special Administrative Measures (Negative List) for the Access of Foreign Investment (2019) (see the appendix for details), as approved by the CPC Central Committee and the State Council, is hereby issued, with effect from July 30, 2019.

Several Policies and Measures of Further Expanding and Improving the Utilization of Foreign Capital (Revised) | 2019-11-28

For the purpose of promoting a new round of high-level opening-up, further relaxing the market access of foreign investments, expanding and improving the utilization of foreign capital in Shenzhen city, the following policies and measures...

Shenzhen Municipal Government policies to support enterprise competitiveness | 2019-09-12

Enterprises that are selected to the Fortune Global 500 for the first time are given a reward of 30 million yuan; enterprises that are selected to the China Fortune 500 for the first time are given a reward of 10 million yuan.

Shenzhen Municipal Government offers preferential policies for headquarters companies | 2019-09-12

Shenzhen will offer a subsidy of 10 million yuan for newly-introduced headquarters companies that promise to generate output value and pay tax to the local government as required within a certain period of time.

Shenzhen Municipal Government supporting policies for the promotion of innovation in science and technology | 2019-09-12

A maximum of 30 million yuan in support is available for the establishment of branch organizations in Shenzhen by national-level innovative entities.
