Beijing
Shanghai
Shenzhen
Guangzhou
Hangzhou
Nanjing
Wuhan
Suzhou
Chengdu

Tianjin
Qingdao
Chongqing
Ningbo
Changsha
Wuxi
Hong Kong
Zhengzhou
Xiamen

Xi'an
Jinan
Foshan
Hefei
Dongguan
Zhuhai
Fuzhou
Kunming
Nanchang

Shenyang
Changzhou
Dalian
Macao
Yantai
Nantong
Quanzhou
Taiyuan
Guiyang

Shijiazhuang
Changchun
Tangshan
Nanning
Xuzhou
Harbin
Zhongshan
Haikou
Huizhou

Hohhot
Urumqi
Lanzhou
Jiangmen
Baoding
Zhaoqing

Chinese Cities of Opportunity 2023

pwc

CDRF 中国发展研究基金会 China Development Research Foundation

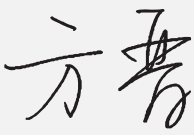
Promoting urban economic recovery and stable, high-quality development

High-quality development is the primary task of building China into a modern socialist country in all respects. Cities are the locomotives of modernisation and are where high-quality development takes place. The past five years have witnessed China's remarkable achievements in urbanisation. The percentage of permanent urban residents has grown from 58.52 percent in 2017 to 65.22 percent in 2022, and the urbanisation quality has been continuously improved. In recent years, the share of the primary sector in China's GDP dropped to around 7 percent with the vast majority of economic activity now taking place in cities. As COVID-19 prevention and control measures have entered a new stage, there has been a gradual rise in residents' willingness to pay for consumer goods and tourism services. Economic vitality is gaining momentum in cities, and this can facilitate economic recovery and stable growth.

China will leverage the role of city clusters and metropolitan areas to promote the coordinated development of large, medium, and small, which was highlighted in the report to the 20th National Congress of the Communist Party of China. By forming economies of scale and industrial agglomeration, key cities and urban clusters have become the drivers and growth poles of regional development, and hence a crucial lever for China's high-quality development. In 2022, the top 50 Chinese cities by GDP contributed to more than 50 percent of the nation's GDP, while the Beijing-Tianjin-Hebei region, the Yangtze River Delta region and the Guangdong-Hong Kong-Macao Greater Bay Area contributed to approximately 40 percent of the nation's GDP. Urban clusters in central and western China, such as in Chengdu-Chongqing, Wuhan, Changsha-Zhuzhou-Xiangtan and the Central Plains urban clusters, are also emerging rapidly, making them an important engine of regional economic development and a major driving force of economic transformation.

This year marks the 10th anniversary of the release of the "Chinese Cities of Opportunity" report. This series of urban observations are the result of the close cooperation and joint efforts of the China Development Research Foundation and PwC. The reports have witnessed Chinese cities' gradual movement towards high-quality development and provided references for urban management. Over the last decade, the number of cities observed has expanded from 15 to 51 in this year's report, covering the key cities of China's major urban clusters. The observation dimensions used in the reports have also undergone constant innovation and adjustment to adapt to the development stages and goals of Chinese cities. More attention has been paid to high-quality urban development in recent years by adding dimensions or variables such as urban resilience, the penetration rate of new energy vehicles, digital cities, urban environmental protection, and green and low-carbon development. The reports have been consistently based on comprehensive observation and analysis and are aimed at exploring the comparative advantages and potential of cities, helping cities to continuously improve and excel, and providing useful references for readers with an interest in urban development opportunities.

I would like to take this opportunity to express my appreciation to the PwC team for their commitment to corporate social responsibility over the years. I look forward to working together with them to provide forward-looking perspectives and insights to city decision-makers and investors, and to contributing to the new development stage of Chinese cities.



Fang Jin

Secretary General, China Development Research Foundation

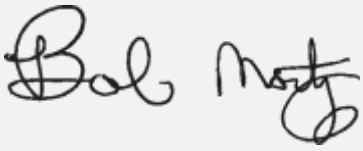
Revitalising cities and driving urban transformation

"Change" and "uncertainty" have been two keywords used to describe the state of the world over the past few years. Macroeconomic volatility, inflation and labour shortages are among the many factors that make the environment challenging for businesses and individuals alike. Uncertainties are likely to persist in the coming years, but strategies for mitigating disruption lie in fostering innovation, economic dynamism and sustainability -- all of which are critical requirements for the continued revitalisation and transformation of our cities.

As places where businesses operate, residents live and tourists visit, cities generate a large amount of consumer demand while serving as a driving force that stimulates production. Global businesses see opportunities in China's huge consumer market, boosted by the country's new public health policies. China's large consumer base can create strong demand and help the country become a world leader in technological innovation. Effective initiatives to restore the economy in the short-term, including stimulating consumption in cities, boosting residents' confidence and demand, and fostering the growth momentum of the service sector, will bring new opportunities for proliferation, dynamism and cooperation.

When it comes to sustained and stable urban development in the medium to long-term, digitalisation, green, and low-carbon innovation will be important drivers of transformation. More specifically, digitalisation has the power to enable industries to transform and empower cities' production and living environments, contributing to green, low-carbon urban environments that will form the most dominant cities of the future. Green concepts and low-carbon initiatives will gradually affect all aspects of life, ranging from supply chains and business production to people's consumption and livelihoods. The increasing awareness and attention to green development, technological innovation and advancement will also bring a range of development opportunities. Multi-dimensional, diversified innovation underpins sustainable urban development. Given the criticality and importance of technological innovation to the advancement of sustainable urban development, we will continue to conduct in-depth analysis in this area in the future.

This year marks the tenth year of the "Chinese Cities of Opportunity" initiative jointly launched by PwC China and the China Development Research Foundation (CDRF). Looking back at the rapid development of Chinese cities and the great changes that have taken place over the past decade, we are honoured to have had the opportunity to witness this historic stage of development in depth. We hope that our analysis of Chinese cities will be helpful to city administrators and investors. Over the past ten years, we have worked closely with the Foundation team, and we would like to express our sincere thanks to the CDRF. As Chinese cities enter a new stage of high-quality development, we will continue to work together with the CDRF to provide perspectives, insight, and analysis on urban development.



Bob Moritz

PwC Global Chairman

Content

Overview

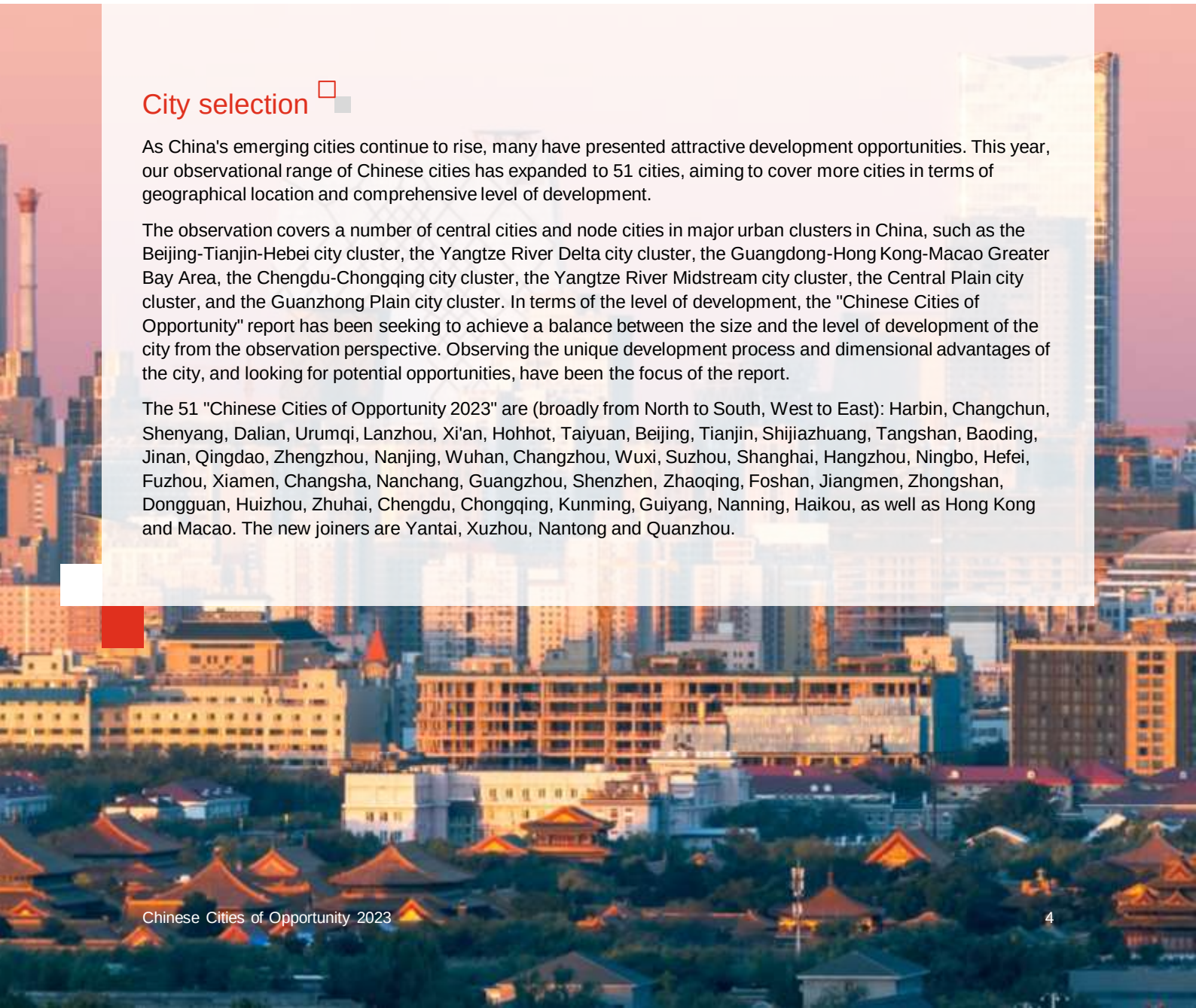
The development and changes of cities bear many imprints of social and economic development, as well as production and life. The achievements from development and experience accumulated at each historical stage guide us in finding development opportunities in the new development cycles. As we moved into 2023, the challenges and uncertainties of external circumstances still exist, the current focus for Chinese cities is to seek sound development opportunities and explore the potential for economic recovery and growth. In the long run, after accomplishing the initial goal of urbanisation, Chinese cities are now entering a new stage of high-quality development. This gives play to the driving role of leading cities in the urban clusters, hence promoting balanced and coordinated development among different areas, encouraging discussions on issues such as green and low-carbon development and digital transformation of cities will be the focus of attention in the new development cycle. From 2014 to 2022, PwC China and the China Development Research Foundation jointly published nine issues of the "Chinese Cities of Opportunity" report. This report is a series of studies observing the development process and opportunities of Chinese cities from a global perspective. It provides comprehensive observations of the development characteristics and realities of Chinese cities from multiple perspectives. While maintaining observations on cities as in previous issues, this year's tenth edition of this report also reviews the observational findings on cities over the past decade.

City selection

As China's emerging cities continue to rise, many have presented attractive development opportunities. This year, our observational range of Chinese cities has expanded to 51 cities, aiming to cover more cities in terms of geographical location and comprehensive level of development.

The observation covers a number of central cities and node cities in major urban clusters in China, such as the Beijing-Tianjin-Hebei city cluster, the Yangtze River Delta city cluster, the Guangdong-Hong Kong-Macao Greater Bay Area, the Chengdu-Chongqing city cluster, the Yangtze River Midstream city cluster, the Central Plain city cluster, and the Guanzhong Plain city cluster. In terms of the level of development, the "Chinese Cities of Opportunity" report has been seeking to achieve a balance between the size and the level of development of the city from the observation perspective. Observing the unique development process and dimensional advantages of the city, and looking for potential opportunities, have been the focus of the report.

The 51 "Chinese Cities of Opportunity 2023" are (broadly from North to South, West to East): Harbin, Changchun, Shenyang, Dalian, Urumqi, Lanzhou, Xi'an, Hohhot, Taiyuan, Beijing, Tianjin, Shijiazhuang, Tangshan, Baoding, Jinan, Qingdao, Zhengzhou, Nanjing, Wuhan, Changzhou, Wuxi, Suzhou, Shanghai, Hangzhou, Ningbo, Hefei, Fuzhou, Xiamen, Changsha, Nanchang, Guangzhou, Shenzhen, Zhaoqing, Foshan, Jiangmen, Zhongshan, Dongguan, Huizhou, Zhuhai, Chengdu, Chongqing, Kunming, Guiyang, Nanning, Haikou, as well as Hong Kong and Macao. The new joiners are Yantai, Xuzhou, Nantong and Quanzhou.



Research methodology

The "Chinese Cities of Opportunity" report adopts PwC's city assessment tools to examine the selected cities. The tools provide targeted observations of the cities from ten dimensions, involving economic growth, society and people's livelihood, urban infrastructure, natural environment, population, city governance, and influence. The development of cities is changing every day. Accordingly, our observation system is not static. We hope to follow the pace of the rapid development of Chinese cities to reflect cities' development achievements and potential opportunities. Therefore, observing from the ten dimensions, we can take a fine-grained look through a lens based on multiple variables. While maintaining the basic principles and keeping the system unchanged, we can make appropriate adjustments to account for the development of the social economy. Nevertheless, urban societies take on rich and diverse forms. History, cultural traditions, and strategies and wisdom that focus on future development cannot be simply measured using data models. We are also constrained by data sources and methods of calculation. We would rather use these tools more to provide a richer and more diverse perspective for observing cities. The city rankings provide no basis for comparison to those of the previous years, that is, the findings in this report are comparatively independent observations.

In this report, the cities are observed in ten dimensions, with each dimension comprising five variables for a total of 50 variables. Some variables encompass sub-indicators, primarily considering the balance of the number of each type of variable under each dimension. At the same time, the data indicators covered by a single variable can appropriately reflect the level of development of that variable. The variables and sub-indicators simultaneously factor in both per capita and gross data to provide an overarching picture of each city's foundation for development and potential opportunities. We analyse all cities based on consistent standards while taking factors such as scale advantage into account. In light of the changes in the statistical scope of some data and improvement of the city observation perspective, this report uses the "green and low-carbon development" variable to replace the "labour force" variable in the "sustainable development" dimension and "museums" to replace the "cultural industry employment" variable in the "culture and quality of life" dimension. Our considerations for the design and data sources of these variables are detailed in the "variables" section of this report.

We use PwC's assessment tools in examining the selected cities. The variables and dimensions are not weighted; every city has a ranking against each variable. One point is awarded to each position up the table, with the scores of the corresponding positions arranged in descending order, i.e., the highest score, for first place, was 51 points and the lowest score, for last place, was one point, with tied rankings receiving equal points. However, for certain dimensions, such as "cost", the scores were arranged in ascending order, i.e., the scores reflect their corresponding positions in the table. Scoring in order reduces the complex, absolute differences between cities to equidistant points. The sum of points awarded to each city for each variable under each dimension constitutes its ranking for that dimension, and the sum of a city's scores across all variables and all dimensions determines the city's overall ranking in the report.

The data were sourced under the principles of objectivity, impartiality, rigour and applicability, and mainly obtained from public sources, including the National Bureau of Statistics, government departments, official statistical yearbooks and bulletins published by each city, as well as research data from authoritative think tanks, universities, and research institutes, or big data research findings. The statistical data cut-off point was 2021, the rest were 2022, and the data collection cut-off point was February 2023. We refer to provincial-level data or other comparable data where the data released by a specific city was insufficient.

Observations

The top four cities in the "Chinese Cities of Opportunity 2023" were: Beijing, Shanghai, Shenzhen, and Guangzhou. The next ten cities are Hangzhou, Nanjing, Wuhan, Suzhou, Chengdu, Tianjin, Qingdao, Chongqing, Ningbo and Changsha. Then followed by: Wuxi, Hong Kong, Zhengzhou, Xiamen, Xi'an, Jinan, Foshan, Hefei, Dongguan, and Zhuhai. Then followed by: Fuzhou, Kunming, Nanchang, Shenyang, Changzhou, Dalian, Macao, Yantai, Nantong and Quanzhou. And lastly: Taiyuan, Guiyang, Shijiazhuang, Changchun, Tangshan, Nanning, Xuzhou, Harbin, Zhongshan, Haikou, Huizhou, Hohhot, Urumqi, Lanzhou, Jiangmen, Baoding and Zhaoqing.

From the observation results, the overall performance of the cities still depends on their accumulated development and comprehensive performance in all dimensions. Beijing, Shanghai, Shenzhen and Guangzhou continue to maintain their leading positions among Chinese cities, with Hangzhou, Nanjing, Wuhan, Suzhou, Chengdu and Tianjin following closely in the top ten. Hangzhou and Nanjing have outstanding advantages in terms of balanced development, with their performance in seven and eight dimensions entering the top ten respectively. Wuhan has maintained its strong momentum of development and ranks in the top ten in many dimensions, for example in "intellectual capital". Suzhou ranks in the top five in terms of "technology and innovation", "transportation and urban planning", "culture and quality of life" and "ease of doing business", reflecting their developmental advantages of being a quality living circle with excellent public services for living and working. Chengdu and Chongqing rank in the top five in terms of "major regional cities", and both in the top ten in terms of “economic clout”, reflecting the rapid improvement of the level of development of the Chengdu-Chongqing economic circle. Tianjin's performance is comparable to its overall ranking in several dimensions, and its development trend is balanced and stable. For conciseness, we will only briefly comment on the top cities in the overall ranking. Please refer to the text for more insights on specific dimension rankings and analysis.

In general, Beijing-Tianjin-Hebei region, Yangtze River Delta region and the Guangdong-Hong Kong-Macao Greater Bay Area are currently the three leading city clusters, and the driving role of the development of the central cities will remain the key driving force for a certain period in the future. At the same time, the leading and exemplary role of central cities has important instructive significance for the development path of other regional central cities. It is encouraging the regions such as the Middle Reaches of the Yangtze River economic belt and the Chengdu-Chongqing Economic circle have also risen rapidly along with the leading central cities. The revitalisation and steady development of these regional economies are important to support the stable and sound development of the overall Chinese economy.

In-depth interviews

The "Chinese Cities of Opportunity 2023" is privileged to include insights and views from the following scholars and experts.

Mr. Yang Weimin, Vice Chairman of the China Center for International Economic Exchanges, elaborates the role of city governments in driving city economic recovery in the article "Three focuses of city governments to drive economic recovery".

Mr. Zheng Lei, President of Hefei University of Technology, takes his practical experience in universities into consideration and shares his insights in the article "Promoting integration, innovation and high-quality development of universities and cities".

Mr. Lu Yuanping, Professor and doctoral supervisor of the School of Public Finance and Taxation, Zhongnan University of Economics and Law, describes the path toward resilient cities in the article “Paths to promote the construction of resilient cities".

Mr. Shen He, President of the Jiangsu Society of Urban Economy, Chief expert of Zhong Zi Think Tank, and former Deputy Director of the Research Office of Jiangsu Provincial People’s Government, discusses from the angle of the development law for city clusters and shares his insights in the article "Highlighting the 'three priorities' of Chinese urban modernisation".

Mr. Li Xiaojiang, former director of China Academy of Urban Planning and Design and a national high-level expert on engineering investigation and design, shares his views from the perspective of urban consumption economy in the article "Reflections on the services and spending economy from the perspectives of urbanisation and cities".

Our report is created from the standpoint of building social responsibility, and all participating interviewees share this vision. Their view and visions shared on key issues concerning the high-quality development of urbanisation, urban economy, intellectual capital and innovation in China have broadened our vision and offered diversified and in-depth insights to readers.

A ten-year review

Reflecting on the past to understand the present, this ten-year review is a summary of our series reports. We hope to summarise our findings and again observe the development and changes of cities from a timeline view. Since the scope of observed cities and indicator framework of the "Chinese Cities of Opportunity" has changed dynamically in the past decade, and Beijing, Shanghai, Hong Kong and Macao have been included in comprehensive rankings since 2019, we have conducted a five-year review and analysis for the four cities, together with Shenzhen and Guangzhou, making a total of six cities, and a 10-year review and analysis for the other cities. The review and analysis focus on the leading cities at the dimension level and mainly observe the continuous changes in the development strength and characteristics of the cities. It is believed that the featured advantageous dimensions of these cities are also where their long-term development opportunities lie.

Review - Key findings of Beijing, Shanghai, Shenzhen, Guangzhou, Hong Kong and Macao

Over the past five years, the six cities of Beijing, Shenzhen, Guangzhou, Hong Kong, and Macao have often been in the top places of several dimensions in our report, and they are also the leading cities with strong capabilities and a high degree of internationalisation among Chinese cities. Therefore, we listed the cities that ranked first in the dimensions over the past five years, and we can see that with the specific variables in the indicator system changing dynamically over the years, Shenzhen, Shanghai, Hong Kong, and Shanghai have obvious leading advantages in "technology and innovation", "major regional cities", "urban resilience" and "culture and quality of life", respectively. In the dimension of "intellectual capital", both Beijing and Guangzhou have shown a certain comparative advantage; in "economic clout", Beijing and Hong Kong have a comparative advantage; in "ease of doing business", Shenzhen has displayed obvious advantages in recent years, and Hong Kong and Shanghai also have displayed a certain level of advantages. These findings also seem to be in line with our general impression of the positioning of these cities. In fact, the economic development level of these six cities is generally good, and relatively balanced in various development dimensions. Cities that failed to rank first in the above dimensions were also among the top five. A leading advantage in a single dimension further highlights the strengths of the city and its unique development characteristics and opportunities lie.

The "transportation and urban planning" and "cost" problems faced by all the global megacities and developed cities are also the same challenges faced by these six cities. For large cities with large urban areas and high green coverage, the efficiency of city administration and operations can be improved through effective planning of roads and diversified traffic modes, and their advantages can be presented to a certain extent. However, for large cities with large populations of permanent residents and a relatively small number of built-up areas, challenges will sustain. The same goes for "sustainable development". The solution to solve the contradiction between resources and development in large cities with a large permanent resident population lies in green and low-carbon development concepts and efficient and intensive development. However, challenges and opportunities always coexist. The cities are guiding the new development opportunities by adopting approaches representing the new type of productivity including alternative energy solutions and digitalisation transformation to maintain their sustainable development and long-term motivations.

Cities ranked first in single dimensions (2019-2023)

	2019	2020	2021	2022	2023
Intellectual capital	Beijing	Beijing Guangzhou	Guangzhou	Beijing	Guangzhou
Technology and innovation	Shenzhen	Shenzhen	Shenzhen	Shenzhen	Shenzhen
Major regional cities	Shanghai	Shanghai	Shanghai	Shanghai	Shanghai
Urban resilience	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Shanghai Hong Kong
Transportation and urban planning	-	Shenzhen	Beijing	-	-
Sustainable development	-	Shenzhen	-	-	-
Culture and quality of life	Macao	Shanghai	Shanghai	Shanghai	Shanghai
Economic clout	Beijing	Beijing	Hong Kong	Hong Kong	Hong Kong
Cost	-	-	-	-	-
Ease of doing business	Hong Kong	Shenzhen	Shanghai	Shenzhen	Shenzhen

Review - Key findings of other cities

The past ten years have witnessed the rapid rise of Chinese cities, and the observed cities of "Chinese Cities of Opportunity" reports have increased from 15 to 51. In addition to Beijing, Shanghai, Shenzhen, and Guangzhou, many "new first-tier" cities have become pillars of China's new urbanisation in the past decade. In this review, we have looked at the top three cities in all dimensions excluding Beijing, Shanghai, Shenzhen, Guangzhou, Hong Kong, and Macao, and observed and summarised the dynamic changes of these cities over time.

In summary, in the dimensions of "intellectual capital", "technology and innovation" and "major regional cities", Nanjing, Hangzhou, and Chongqing were the cities with clear advantages, which is also the result of the combined effect of factors such as urban development emphasis, historical assets, regional industrial characteristics, and geographical hub location. There are two to three cities with comparative advantages in other dimensions, such as Hangzhou and Wuhan in "economic clout", and Hangzhou and Suzhou in "ease of doing business". This also reflects the rapid rise and development of emerging cities in the past decade and the fierce competition among cities. The cities have sustained excellent performance in the case of dynamic adjustment of observation variables in the dimension. The main listed cities in the "cost" dimension are northern cities, where the issue of relatively uneven regional development has existed for a certain historical period of time. Future attention needs to be directed at making full use of this advantage and obtaining development opportunities through regional coordinated development and other measures.

Some cities were included in the observation at a relatively later time, and also showed sustained comparative advantages. For example, Ningbo was in the top place for many times in the dimensions of "sustainable development" and "ease of doing business". Several cities were listed top in some years in one dimension, as the indicator system varied from year to year, which reflected that the cities have certain advantages in this dimension but have not yet formed a comprehensive level of advantage and there is still room to improve. For example, Haikou had excellent performance in the "sustainable development" dimension in 2019 and 2023, and Zhuhai ranked the top in "transportation and urban planning" from 2017 to 2019 and in the "culture and quality of life" from 2017 to 2018. Hopefully, these cities will also achieve more comprehensive development in their advantageous fields over time.

From the perspective of regional economic development that has attracted more attention in recent years, the review has found that all the cities listed cover major city clusters such as Beijing-Tianjin-Hebei, Yangtze River Delta, and the Guangdong-Hong Kong-Macao Greater Bay Area. Several important regions such as the middle reaches of the Yangtze River economic belt, the Chengdu-Chongqing economic circle, as well as the important western regional core city Xi'an were also listed in multiple dimensions. These central cities play a particularly important role in driving the development of city clusters in the region. Their strong development momentum has a key impact on achieving the goals of coordinated and balanced development of the area in the future.

Top three cities in each dimension (2014-2023, excluding Beijing, Shanghai, Shenzhen, Guangzhou, Hong Kong and Macao)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Intellectual capital	Nanjing	Nanjing	Hang-zhou	Hang-zhou	Nanjing	Nanjing	Chang-sha	Chang-sha	Wuhan	Wuhan
	Hang-zhou	Hang-zhou	Wuhan	Nanjing	Hang-zhou	Chang-sha	Nanjing	Nanjing	Nanjing	Nanjing
	Tianjin	Wuhan	Nanjing	Suzhou	Cheng-du	Wuhan	Xi'an	Xi'an	Chang-sha	Hang-zhou

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Technology and innovation	Xi'an	Hang-zhou	Hang-zhou	Hang-zhou	Hang-zhou	Hang-zhou	Hang-zhou	Hang-zhou	Hang-zhou	Hang-zhou
	Nanjing	Nanjing	Nanjing	Nanjing	Wuhan	Suzhou	Suzhou	Suzhou	Nanjing	Suzhou
	Hang-zhou	Xiamen	Suzhou	Wuhan	Nanjing	Zhong-shan	Cheng-du	Dong-guan	Suzhou	Nanjing
			Xiamen							

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Major regional cities	Chong-qing	Cheng-du	Chong-qing	Chong-qing	Chong-qing	Chong-qing	Chong-qing	Chong-qing	Chong-qing	Chong-qing
	Wuhan	Chong-qing	Cheng-du	Cheng-du	Cheng-du	Cheng-du	Cheng-du	Cheng-du	Cheng-du	Cheng-du
	Tianjin	Wuhan	Xi'an	Xi'an	Hang-zhou Nanjing	Hang-zhou	Wuhan	Wuhan	Hang-zhou	Hang-zhou

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Urban resilience	Wuhan	Wuhan	Cheng-du	Cheng-du	Hang-zhou	Taiyuan	Tianjin	Xiamen	Tianjin	Hang-zhou
	Hang-zhou	Cheng-du	Hang-zhou	Wuhan	Cheng-du	Cheng-du	Zheng-zhou	Zhuhai	Hang-zhou	Tianjin
	Nanjing	Hang-zhou	Shen-yang	Hang-zhou	Xi'an	Zheng-zhou	Cheng-du	Tianjin	Wuhan	Qingdao

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Transpor-tation and urban planning	Shen-yang	Shen-yang	Dalian	Zhuhai	Zhuhai	Zhuhai	Nanjing	Nanjing	Nanjing	Xiamen
	Tianjin	Xi'an	Xi'an	Nanjing	Nanjing	Nanjing	Suzhou	Suzhou	Xiamen	Nanjing
	Nanjing	Nanjing	Nanjing	Xiamen	Hang-zhou	Xi'an	Xiamen	Wuhan	Suzhou	Foshan
		Wuhan								

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Sustainable-development	Xiamen	Qingdao	Suzhou	Wuhan	Chang-sha	Haikou	Ningbo	Ningbo	Ningbo	Haikou
	Chong-qing	Nanjing	Hang-zhou	Hang-zhou	Hang-zhou	Foshan	Chang-sha	Zhuhai	Dong-guan	Fuzhou
	Qingdao	Xiamen	Xiamen	Cheng-du	Xiamen	Xiamen	Xiamen	Nanjing	Suzhou	Huizhou

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Culture and quality of life	Nanjing	Harbin	Chang-sha	Zhuhai	Zhuhai	Chang-sha	Nanjing	Hang-zhou	Hang-zhou	Hang-zhou
	Shen-yang	Lanzhou	Nanning	Nanjing	Xiamen	Fuzhou	Hang-zhou	Nanjing	Nanjing	Suzhou
	Xi'an	Chang-chun	Xiamen	Fuzhou	Nanjing	Wuhan	Chang-sha	Suzhou	Suzhou	Nanjing
			Suzhou		Chang-sha					

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Economic clout	Tianjin	Tianjin	Tianjin	Hang-zhou	Hang-zhou	Hang-zhou	Cheng-du	Hang-zhou	Hang-zhou	Hang-zhou
	Chong-qing	Wuhan	Wuhan	Wuhan	Tianjin	Cheng-du	Xi'an	Cheng-du	Nanjing	Nanjing
	Dalian	Hang-zhou	Hang-zhou	Nanjing	Cheng-du	Xi'an	Wuhan	Nanjing	Wuhan	Suzhou
	Wuhan			Tianjin						

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cost	Xi'an	Shen-yang	Kun-ming	Taiyuan	Taiyuan	Baoding	Hohhot	Tang-shan	Hohhot	Tang-shan
	Zheng-zhou	Urumqi	Urumqi	Kun-ming	Shijia-zhuang	Shijia-Zhuang	Tang-shan	Taiyuan	Tang-shan	Hohhot
	Shen-yang	Nanjing	Shen-yang	Shijia-Zhuang	Shen-yang	Tang-shan	Baoding	Hohhot	Baoding	Baoding
					Kun-ming			Baoding		

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Ease of doing business	Xiamen	Hang-zhou	Suzhou	Suzhou	Suzhou	Xiamen	Suzhou	Suzhou	Suzhou	Suzhou
	Wuhan	Tianjin	Hang-zhou	Nanjing	Nanjing	Ningbo	Hang-zhou	Hang-zhou	Hang-zhou	Hang-zhou
	Hang-zhou	Qingdao	Wuhan	Zheng-zhou	Hang-zhou	Hang-zhou	Ningbo	Nanjing	Ningbo	Ningbo

Rankings 2023 and analysis

		1. Intellectual capital	2. Technology and innovation	3. Major regional cities	4. Urban resilience	5. Transportation and urban planning
1	Beijing	228	235	227	214	163
2	Shanghai	212	235	249	221	100
3	Shenzhen	193	250	208	212	122
4	Guangzhou	230	240	240	193	127
5	Hangzhou	201	234	212	209	120
6	Nanjing	205	195	199	180	184
7	Wuhan	222	160	201	162	169
8	Suzhou	134	217	144	169	173
9	Chengdu	183	173	214	148	147
10	Tianjin	191	192	197	208	114
11	Qingdao	153	177	178	192	164
12	Chongqing	156	120	234	177	90
13	Ningbo	128	169	168	171	169
14	Changsha	199	162	161	140	148
15	Wuxi	146	188	100	158	162
16	Hong Kong	138	105	158	221	113
17	Zhengzhou	187	175	165	111	141
18	Xiamen	139	140	144	171	186
19	Xi'an	197	155	188	127	135
20	Jinan	142	140	180	162	131
21	Foshan	128	185	100	90	179
22	Hefei	155	148	148	74	131
23	Dongguan	123	191	49	89	137
24	Zhuhai	128	159	70	170	160
25	Fuzhou	130	122	123	103	96
26	Kunming	107	99	170	110	133
27	Nanchang	134	117	118	126	148
28	Shenyang	145	101	146	125	113
29	Changzhou	113	159	69	87	160
30	Dalian	134	81	124	138	164
31	Macao	83	95	107	196	135
32	Yantai	105	62	99	147	125
33	Nantong	78	110	80	119	124
34	Quanzhou	56	97	93	86	112
35	Taiyuan	151	127	77	89	155
36	Guiyang	98	101	178	115	121
37	Shijiazhuang	104	65	102	97	118
38	Changchun	130	79	103	106	82
39	Tangshan	74	46	82	144	109
40	Nanning	89	70	131	84	118
41	Xuzhou	76	82	93	97	120
42	Harbin	125	62	111	78	82
43	Zhongshan	73	172	29	61	69
44	Haikou	68	90	111	37	88
45	Huizhou	67	98	52	71	75
46	Hohhot	72	25	53	39	132
47	Urumqi	79	42	74	93	125
48	Lanzhou	112	60	93	80	115
49	Jiangmen	61	85	28	90	109
50	Baoding	57	32	35	80	122
51	Zhaoqing	45	39	22	83	92

6. Sustainable development	7. Culture and quality of life	8. Economic clout	9. Cost	10. Ease of doing business	Total score
163	247	234	48	217	1976
136	251	241	54	236	1935
172	221	224	39	240	1881
182	227	206	35	186	1866
149	230	216	32	220	1823
127	220	205	52	196	1763
127	200	194	104	155	1694
114	222	203	67	230	1673
156	163	186	115	176	1661
111	159	166	79	171	1588
133	171	173	66	179	1586
160	172	185	168	120	1582
155	158	175	82	198	1573
150	156	170	131	149	1566
143	172	183	111	184	1547
119	147	246	55	213	1515
127	138	153	157	160	1514
160	125	153	87	197	1502
124	136	165	127	129	1483
133	143	159	102	136	1428
165	141	149	130	138	1405
111	146	155	132	143	1343
146	155	130	117	183	1320
166	74	144	100	127	1298
183	146	127	117	130	1277
148	121	102	165	105	1260
138	113	129	142	82	1247
117	144	97	167	91	1246
86	135	142	120	164	1235
117	121	120	122	110	1231
128	131	116	59	151	1201
104	113	129	191	124	1199
98	152	134	170	128	1193
137	147	88	184	155	1155
99	87	96	193	80	1154
157	70	79	174	53	1146
104	76	95	199	103	1063
107	102	71	184	84	1048
99	80	119	219	53	1025
167	79	45	129	67	979
73	76	100	175	76	968
101	102	52	179	63	955
128	82	58	158	123	953
189	68	75	107	82	915
173	60	65	149	102	912
151	65	54	217	43	851
66	35	83	175	72	844
33	89	25	184	23	814
121	32	48	175	61	810
92	51	73	204	61	807
139	28	25	186	22	681

1. Intellectual capital

There are five variables under the "intellectual capital" dimension, which observes a city's intellectual capital reserve and R&D capacities. Among them, "scale of higher education" and "educational level" are designed to measure a city's talent pools and the population's educational level, respectively. "Enterprise expenditure on R&D", "state key laboratories", and "expenditure on science and technology" are used to assess enterprise competitiveness in R&D and a city's basic research accumulation and R&D inputs, respectively.

Guangzhou, Beijing, Wuhan, Shanghai, and Nanjing take the top five spots in this dimension. Hangzhou, Changsha, Xi'an, Shenzhen, Tianjin, Zhengzhou, Chengdu, Chongqing, Hefei, and Qingdao rank sixth to 15th. These regional central cities boast solid strengths in basic research and invest heavily to promote the industrial application of scientific research results. In particular, some get high scores in all five variables, reflecting their comprehensive strength in intellectual capital.

The Yangtze River Delta and the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) stand out in "enterprise expenditure on R&D" and "expenditure on science and technology". Suzhou, Shanghai, Wuxi, Hangzhou, Ningbo, Changzhou, and Nantong (which has been included in our observations for the first time), all located in the Yangtze River Delta, rank high in "enterprise expenditure on R&D" thanks to their endeavours to facilitate in-depth collaboration between research institutes and enterprises, and foster new drivers for high-quality sci-tech innovation. Macao, Shenzhen, Zhuhai, Guangzhou, and Foshan in the GBA are among the top 15 in "expenditure on science and technology". The region's mighty economic power guarantees significant and sustained investments in research and development. During the 14th Five-Year Plan period (2021–2025), Guangdong province will continue to increase investments in basic research, step up efforts to build the GBA comprehensive national science centre, and give better play to the role of science and technology in supporting high-quality economic development.

Cities in Central China and West China fare pretty well in the "scale of higher education" and "state key laboratories" thanks to their long-standing strengths and national policy support. A vast talent pool is of strategic significance for driving regional economic development and social progress in the long run. Zhengzhou, Wuhan, Chongqing, Chengdu, and Xi'an, which traditionally dominate educational resources, are at the forefront of the "scale of higher education" variable. Harbin, Kunming, and Changsha also make it into top ten with a high number of students in higher education. Among them, Changsha has vigorously piloted the integration of enterprises with vocational schools and universities and fully exploited the resource advantages of the four key universities based in the city to serve the strategy of "strengthening the provincial capital", hence promoting the integrated development with Zhuzhou and Xiangtan and drive the development of other surrounding cities. In terms of "state key laboratories", Xi'an has given staunch support to frontier fields such as networking and communications, AI, photonics, microelectronics etc., and focused on facilitating collaboration between Northwest University and Xi'an University of Science and Technology on the establishment of state key laboratories. Lanzhou, also located in West China, ranks 15th in this variable, higher than the overall dimension. The city has focused on energy science, ecology and environment, protection of cultural heritage, and other dominant areas with the characteristics of Gansu province.

The "educational level" variable is designed to gauge a city's high-quality human resources and the universalisation of education with two indicators, that is, the percentage of the population holding junior college degrees or above, and the illiteracy rate. Beijing, Shenzhen, Xi'an, and Taiyuan occupy the top four positions in this dimension. Talent is essential for Northeast China to promote industrial transformation and upgrading and revitalise the region. Shenyang, Dalian, and Changchun, all major cities in Northeast China, come in fifth, 14th, and 16th in the variable, respectively, which are higher than their rankings in the overall dimension. Shenyang has focused on promoting the high-quality, well-balanced development of education, making quality education resources accessible to 100 percent of schools in compulsory education. It is the first national pilot zone for comprehensive reform of basic education in Northeast China.

		Enterprise expenditure on R&D	Scale of higher education	State key laboratories	Expenditure on science and technology	Educational level	Score
1	Guangzhou	47	51	46	41	45	230
2	Beijing	41	36	51	49	51	228
3	Wuhan	38	49	48	44	43	222
4	Shanghai	49	33	50	38	42	212
5	Nanjing	33	44	49	42	37	205
6	Hangzhou	44	35	42	45	35	201
7	Changsha	34	42	44	33	46	199
8	Xi'an	32	46	47	23	49	197
9	Shenzhen	51	9	33	50	50	193
10	Tianjin	39	34	43	35	40	191
11	Zhengzhou	27	50	33	32	45	187
12	Chengdu	31	47	41	37	27	183
13	Chongqing	45	48	39	17	7	156
14	Hefei	35	38	26	46	10	155
15	Qingdao	37	28	37	27	24	153
16	Taiyuan	10	29	33	30	49	151
17	Wuxi	46	12	20	36	32	146
18	Shenyang	19	27	39	13	47	145
19	Jinan	29	40	33	25	15	142
20	Xiamen	25	18	33	39	24	139
21	Hong Kong	21	10	45	22	40	138
22	Suzhou	50	24	1	47	12	134
22	Dalian	22	25	33	16	38	134
22	Nanchang	15	41	23	34	21	134
25	Fuzhou	28	26	23	26	27	130
25	Changchun	13	30	41	10	36	130
27	Zhuhai	18	5	15	48	42	128
27	Ningbo	43	16	15	43	11	128
27	Foshan	42	11	1	40	34	128
30	Harbin	12	45	34	3	31	125
31	Dongguan	48	8	15	18	34	123
32	Changzhou	40	13	15	29	16	113
33	Lanzhou	8	32	37	6	29	112
34	Kunming	9	43	35	11	9	107
35	Yantai	23	23	15	24	20	105
36	Shijiazhuang	16	37	26	5	20	104
37	Guiyang	7	31	33	19	8	98
38	Nanning	3	39	20	7	20	89
39	Macao	1	1	26	51	4	83
40	Urumqi	4	21	20	12	22	79
41	Nantong	36	7	1	31	3	78
42	Xuzhou	20	17	23	15	1	76
43	Tangshan	30	20	1	8	15	74
44	Zhongshan	14	2	1	28	28	73
45	Hohhot	6	22	15	2	27	72
46	Haikou	2	14	20	1	31	68
47	Huizhou	26	4	1	21	15	67
48	Jiangmen	17	3	1	20	20	61
49	Baoding	11	15	20	4	7	57
50	Quanzhou	24	19	1	9	3	56
51	Zhaoqing	5	6	15	14	5	45

Interview

Three focuses of city governments to drive economic recovery

Yang Weimin
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The urban economy is the mainstay of the national economy. The recovery of the national economy will only come after that of the urban economy as a whole. This year, local governments should put effort into the following three aspects to speed up economic recovery.

1. Increasing urban consumer spending

In the past three years following the outbreak of the pandemic, consumer spending was the most affected demand-side account. The contraction in demand at present is mainly caused by a contraction in consumer spending. Likewise, insufficient domestic demand is largely a result of insufficient consumer spending. Therefore, whether a city adheres to a people-centric development philosophy and has committed itself to economic development and livelihood improvement should be ultimately determined by whether its urban consumer spending has increased. City governments should give priority to recovering and increasing spending over expanding investment. The long-established mindset that increasing domestic demand equals expanding investment must be modified. City governments should try to raise the income of urban residents, implement policies that bring benefits to residents, reduce taxes and facilitate transfer payments, and modify the policies curbing consumption in the real estate, automobile and specific service sectors.

2 Stabilising the real estate industry

In the last decade or so, many cities have seen an urban economic growth pattern fuelled by soaring housing prices, where real estate companies, financial institutions and local governments (local government financing platforms) support and benefit each other. However, given the total national population reaching its peak, the large-scale cross-regional population flow in particular, together with the weakened housing price incentives, real estate companies, financial institutions and local governments are now exposed to increasing risks. Moreover, years of administrative intervention and strict supervision have led to an industry-wide recession in the real estate sector. The real estate industry contributes heavily to the GDP of many cities. It is far from a sunset industry in cities with net population inflows, where both house rentals and house purchases are still in inelastic demand. It is therefore still important for cities with net population inflows to steadily increase the supply of residential houses. In the short term, city governments should make every effort to ensure the smooth completion of housing projects. In the meantime, they should have a thorough understanding of the new housing system and the new development mode of the real estate industry proposed by the report to the 20th National Congress of the Communist Party of China (CPC) and continue to meet the housing demands of people buying their first house or seeking to improve their housing conditions. In particular, local governments should strive to solve the housing problems for new citizens and young people and proactively advance reforms in real estate-related fields such as land, finance, housing provident funds, presale, leasing and allow tenants to enjoy the same rights as homeowners.

3. Supporting the development and expansion of the private sector

As a major contributor to the urban economy, the private sector plays an irreplaceable role in promoting urban development, stimulating innovation, generating tax revenue, expanding exports, creating jobs, achieving common prosperity, and vitalising cities. With lowered expectations of private economy development, the growth of private investment and the private economy has slowed down. Promoting the development and expansion of the private sector was put forward by the report to the 20th National Congress of the CPC for the first time. The Central Economic Work Conference also highlighted "working unswervingly both to consolidate and develop the public sector and to encourage, support and guide the development of the non-public sector". City governments should implement the plans proposed by the report to the 20th National Congress of the CPC and the Central Economic Work Conference and help to revert the outlook on the private sector. City governments should guide public opinion in accordance with relevant laws and take an unequivocal stance towards wrong sentiments. City governments should protect the ownership of all enterprises and the property rights of all market entities in accordance with relevant laws. City governments should rescind official documents and special supervision biased against the private sector to break down hidden barriers. City governments should improve the government-enterprise communication mechanism and solicit private entrepreneurs' opinions before formulating policies. City governments should set up a mechanism for government leaders to liaise with enterprises. City governments should improve the accountability mechanism for public servants.

2. Technology and innovation

Changes and progress in new advanced technologies unlock ample opportunities for industrial restructuring and serve as important underpinnings of the digital transformation of cities. The "technology and innovation" dimension looks at the maturity of a city's technological development and the level of technological innovation in the digital field. There are five variables under this dimension, namely, "granted patents", "high-tech enterprises", "penetration rate of new energy vehicles", "mobile Internet" and "digital cities".

Among the top ten cities in this dimension, there are five cities in the Yangtze River Delta (Shanghai, Hangzhou, Suzhou, Nanjing and Wuxi), three in the GBA (Shenzhen, Guangzhou, and Dongguan), and two in the Beijing-Tianjin-Hebei region (Beijing and Tianjin), reflecting a relatively high level of regional aggregation of technological development. Shenzhen and Suzhou take the top two spots in "granted patents", followed by Zhuhai, Wuxi and Changzhou, which rank higher in the variable than that of the overall dimension. a state-level intellectual property protection centre and a public service operations platform, Zhuhai strives to build a full-process intellectual property value chain covering intellectual property creation, application, protection, management and services to empower the high-quality development of the city's pillar industry clusters, and to provide technology services for sci-tech innovation and development in the GBA to create a unique positioning in the region.

Suzhou, Hangzhou, Tianjin, Wuhan, Chengdu, Nanjing, and Dongguan perform well in the "high-tech enterprises" variable. Since Wuhan launched a special campaign supporting high-tech enterprises, industry clusters having an output of over 1 trillion yuan such as optoelectronic information, automotive and parts and biomedicine have been flourishing. There has also been an inexorable rise in integrated circuits and other strategic emerging industries. In recent years, Chengdu has rolled out a raft of measures to facilitate the application of sci-tech advances, highlighted the major role of enterprises in innovation, and seen a rapid increase in the number of high-tech enterprises. New energy vehicles (NEVs) are a combination of multiple transformative technologies such as new energy, new materials, the Internet, big data and AI, and offer a key pathway for cities to deal with climate change and advance green transformation. In addition to the Ministry of Finance's purchase tax exemption policy for NEVs, local governments have also introduced green consumption stimulus policies to boost the development of the NEV industry. In terms of the "penetration rate of new energy vehicles" variable, Haikou, Xiamen, Taiyuan and Hefei come in 2nd, 8th, 11thand 15th, respectively. Haikou has ramped up the building of a global NEV experience centre, a cutting-edge NEV hub featuring high-level exhibitions and events, as well as high-end smart manufacturing industry clusters. With the vision to become the capital of NEVs with global influence, Hefei is home to six top NEV makers, including BYD, NIO, and VW (Anhui), and a number of key supporting enterprises such as Gotion High-tech Co, CALB and JEE. The NEV industry chain is showing strong momentum for development.

Cities today are all exploring the frontier of digital transformation. The "mobile Internet" variable is used to assess a city's information infrastructure and applications. Zhengzhou, Zhongshan, Kunming, Taiyuan and Xi'an rank higher in the variable than in the overall dimension. With regard to the "digital cities" variable, pacesetting cities in the Internet industry have made great strides in digital governance and digital economy, benefiting from their solid basis and competitive edges in the digital field. Shenzhen, Guangzhou, Shanghai, Hangzhou, Nanjing, and Beijing lead in this ranking. Dongguan climbs up to the seventh place. It has leveraged digital technologies such as cloud computing and big data to build a fully smart city system, accelerated the implementation of the digital government initiative to improve the effectiveness of flat management and support high-quality economic development.

		Granted patents	High-tech enterprises	Penetration rate of new energy vehicles	Mobile Internet	Digital cities	Score
1	Shenzhen	51	49	51	48	51	250
2	Guangzhou	46	48	47	49	50	240
3	Beijing	41	51	46	51	46	235
3	Shanghai	37	50	49	50	49	235
5	Hangzhou	45	46	48	47	48	234
6	Suzhou	50	47	31	45	44	217
7	Nanjing	43	42	42	21	47	195
8	Tianjin	36	45	45	39	27	192
9	Dongguan	40	41	19	46	45	191
10	Wuxi	48	35	40	24	41	188
11	Foshan	44	39	22	40	40	185
12	Qingdao	38	38	23	35	43	177
13	Zhengzhou	29	32	43	44	27	175
14	Chengdu	23	43	38	31	38	173
15	Zhongshan	42	23	34	43	30	172
16	Ningbo	39	31	30	31	38	169
17	Changsha	25	37	40	33	27	162
18	Wuhan	33	44	33	11	39	160
19	Zhuhai	49	18	30	27	35	159
19	Changzhou	47	28	27	23	34	159
21	Xi'an	28	40	32	38	17	155
22	Hefei	32	34	37	13	32	148
23	Xiamen	35	26	44	22	13	140
23	Jinan	34	33	15	37	21	140
25	Taiyuan	18	21	41	41	6	127
26	Fuzhou	21	25	26	17	33	122
27	Chongqing	11	36	18	19	36	120
28	Nanchang	22	17	36	25	17	117
29	Nantong	30	24	21	5	30	110
30	Hong Kong	7	1	18	37	42	105
31	Guiyang	14	9	25	35	18	101
31	Shenyang	20	30	4	20	27	101
33	Kunming	16	12	20	42	9	99
34	Huizhou	24	19	14	9	32	98
35	Quanzhou	31	15	18	18	15	97
36	Macao	6	1	28	33	27	95
37	Haikou	15	6	50	15	4	90
38	Jiangmen	26	20	12	5	22	85
39	Xuzhou	27	8	25	3	19	82
40	Dalian	19	29	6	15	12	81
41	Changchun	12	22	6	28	11	79
42	Nanning	3	11	35	16	5	70
43	Shijiazhuang	10	27	11	10	7	65
44	Harbin	8	16	2	6	30	62
44	Yantai	17	14	9	8	14	62
46	Lanzhou	13	5	8	31	3	60
47	Tangshan	2	13	13	7	11	46
48	Urumqi	9	4	2	26	1	42
49	Zhaoqing	4	7	7	1	20	39
50	Baoding	1	10	11	2	8	32
51	Hohhot	5	3	3	12	2	25

Interview

Promoting integration, innovation and high-quality development of universities and cities

Zheng Lei
President of Hefei University of Technology

In recent years, Hefei has persisted in making quality innovations and strived to break new ground in pursuing high-quality development. It has emerged from an obscure city to a widely recognised achiever. Its outstanding advanced manufacturing industry is the main force behind the rapid economic growth. Starting with building the three national-level strategic emerging industry clusters, namely new-type display devices, integrated circuits and artificial intelligence (AI), Hefei has been working hard to make these emerging industries including display devices, new energy vehicles, integrated circuits and AI its phenomenal industrial landmarks.

As the primary resources of talent, science and technology, and innovation, universities have an irreplaceable role in promoting the high-quality development of cities. In the process of Hefei's rapid development, Hefei University of Technology (HFUT) has made full use of its strength - a discipline system highly consistent with the industrial structure - and made important contributions in promoting the city-university integration, industry-education integration and education-talent integration. Every year, about 2,800 HFUT graduates stay and work in Hefei, of whom more than 70 percent are mainly engaged in industries such as manufacturing, electronic information, electric power, and technology services. A large number of alumni have become the backbone of leading enterprises such as Sungrow Power Supply Co., Anhui JAC Automobile Co., NIO Inc, BOE Technology Group Co., and ChangXin Memory Technologies, Inc. (CXMT). Since the beginning of the 13th Five-Year Plan period, HFUT has been granted 5,077 invention patents, successively served more than 2,500 enterprises and public institutions in Anhui province, and participated in over 4,000 cooperation projects, of which nearly 70 percent are in Hefei. It has built a business incubation and growth system that connects HFUT Intelligent Valley, HFUT Intelligent Manufacturing Institute, and High-tech Industrial Park, developed 41 technological innovation platforms of various types together with partners, and incubated more than 140 enterprises (of which 27 have been recognised as Chinese high-tech enterprises, and five have been listed on the Anhui Equity Exchange's Sci-Tech Innovation Board). This has made HFUT an important source of technology enterprises for Hefei.

The development of a city is inseparable from the education, technology and human resources of a university. The development of a university needs funding, land, industrial and policy support. The bond between the two makes them closely connected and interdependent. If a university and a city share the same dream, a new landscape of development featuring two-way empowerment will emerge. Therefore, the development quality and implications of a city require the intellectual support of universities, while universities need the all-around support of the city to play their due role. Only in this way can they complement each other. Anticipating the future, HFUT will respond to the country's important strategic needs and focus on key areas such as integrated circuits, new-type displays, AI, new energy vehicles and intelligent connected vehicles, high-end equipment manufacturing, green food, healthcare, information technology, and new materials. HFUT will give full play to the fundamental and strategic role of education, technology and talent in supporting the development of emerging industries.

First, HFUT will promote organised scientific research and increase its research and innovation capacity to help create the cradle of technological innovation. Efforts will be made to develop first-class disciplines and rely on big projects featuring leading-edge disciplines and technological innovation to advance the creation of a high-level discipline base. Progress will be made in building scientific research platforms, accelerating the construction of basic science centres, preparing for the construction of national-level base platforms such as key national laboratories, and building the artificial intelligence research institute and energy research institute of Hefei Comprehensive National Science Centre. Efforts will also be made to promote the commercialisation of scientific and technological advances, explore new models of city-university symbiosis and industry-university-city integrated development, and build a number of platforms for the commercialisation of scientific and technological advances and industrial incubation. The reform of the scientific research system will be deepened, and an academic quality-oriented resource allocation mechanism will be established, along with a medium- and long-term goal-oriented assessment and evaluation mechanism.

Second, HFUT will give play to its strengths in disciplines and specialties and promote the development of urgently needed talent to help create a hub of emerging industries. Efforts will be made to advance the development of urgently needed undergraduates and establish a linkage mechanism between talent development and industrial demand. High-end talent training and the academic degree postgraduate cultivation model will be improved, and the reform of the professional degree postgraduate cultivation system will be deepened. Efforts will also be made to develop advantageous and characteristic subjects, adjust, merge or integrate some subjects, draw up a list of key supported subjects and specialties, and push forward the precise alignment of subjects and specialties with industrial demand. The integration of disciplinary subjects will be promoted, and new and emerging disciplinary subjects will be developed. In addition, HFUT will try to promote the integration of education and talent introduction and take advantage of national high-level talent projects and local talent policy to accelerate the development and introduction of a number of top-notch talents, leaders and innovation teams active at the forefront of the international academic community.

Third, HFUT will promote the development of the low-carbon economy and serve green transformation across the board to help build a model area for the Beautiful China initiative. Following the principle of "pursuing green development and promoting harmony between humanity and nature" proposed in the Report to the 20th National Congress of the Communist Party of China, the university will adopt a holistic approach, plan for the development of green education, build a green discipline system, improve the green curriculum system, build a green education and teaching system, advocate green and low-carbon living, and develop talent specialising in green development. It will make active efforts to develop green technologies and focus on key areas such as efficient utilisation, energy efficiency, pollution control, and green products. Efforts will also be made to achieve breakthroughs in basic research, organise research to develop key green technologies, and strengthen the guidance and education of leaders and talents in green innovation. The role of the university as the main player in basic research on green technology and the cradle of major technological innovation will be brought into full play to provide talent and technology support for achieving carbon peaking and carbon neutrality.

Overall, universities are the most advanced and concentrated parts of urban culture, an important display window of urban civilisation, and a key source of intellectual support for a city's development. Higher education should be revitalised, and the cultural, educational and technological strengths of universities should be leveraged to drive the development of a city's culture, economy and technological innovation. This will contribute to the prosperity of the city and raise its quality of development, as well as residents' ethical and cultural standards. Therefore, universities play a crucial role in this regard.

3. Major regional cities

City clusters and central cities are the major drivers and the core engine of the country's development, forming a regional economic layout where cities complement each other's strengths to pursue high-quality development. During the 14th Five-Year Plan period, one of the most important challenges and opportunities in new urbanisation is how to promote the coordinated development of large, medium, and small cities and towns, and to foster a well-structured regional pattern featuring a clear division of labour, effective collaboration and integrated functions. The "major regional cities" dimension evaluates a city's performance as a geographical and economic hub in the fields of tourism, transportation and logistics. It includes five variables: "star-graded hotels", "airplane take-offs and landings", "passenger capacity", "freight volume" and "exhibition economy".

Shanghai, Guangzhou, Beijing and Shenzhen rank high in this dimension. Chongqing and Chengdu both make it into the top five, reflecting the robust development strength of the Chengdu-Chongqing economic circle. Three major city clusters, the Yangtze River Delta, the GBA and the Beijing-Tianjin-Hebei region, stay ahead in this dimension. Wuhan, Xi'an, Jinan and Qingdao also perform well. These central cities play a driving and exemplary role in the Yangtze River middle reaches city cluster, Guanzhong Plain city cluster, and the Shandong peninsula city cluster, respectively, which are key to promoting the balanced development of East, Central and West China.

The gateway cities in Southwest China rank high in each variable thanks to their geographic advantages, which pave the way for high-quality development of the regional economy. The Chengdu-Chongqing city cluster sits at the starting point of the New Western Land-Sea Trade Corridor, and provides strategic support for the Belt and Road Initiative and the Yangtze River Economic Belt. Chongqing gets a high score in the "star-graded hotels" and "freight volume" variables, reflecting its role as an open hub of trade and logistics in the western region. Chengdu stands out in "passenger capacity" and "exhibition economy". The two central cities complement each other's strengths to facilitate the flow and aggregation of production factors and foster a high-quality economic development pattern in West China.

Guiyang, a representative of the Qianzhong (central Guizhou) city cluster, stays among the top in the "passenger capacity" and "freight volume" variables. Based on the three national transport corridors (the New Western Land-sea Corridor, the Shanghai-Kunming high-speed railway and the Line from the GBA to the Chengdu-Chongqing economic circle), the city has played a pivotal role in driving the formation of three urban development belts. Central and western cities including Kunming, Changsha, Zhengzhou, and Urumqi rank higher in the "airplane take-offs and landings" variable than in the overall dimension. They serve as a nexus in air transport, enhancing cohesion across cities.

In East China, the advantages of the regional central cities in resources and industry have been consolidated and mechanisms have been improved to advance the coordinated development of city clusters and metropolitan areas. Jiangsu province has three metropolitan areas, namely, the Nanjing metropolitan area, the Suzhou-Wuxi-Changzhou metropolitan area and the Xuzhou metropolitan area, which amplify the influence of major cities and form a networked pattern of city clusters with multiple centres, tiers and nodes. Nanjing performs equally well in all variables. Suzhou does relatively well in "star-graded hotels" and "passenger capacity". Xuzhou, a new addition to our observation, comes in eighth in "freight volume". Capitalising on its geographic advantages, Xuzhou is speeding up the construction of a modern comprehensive transportation system, with a view to becoming a multimodal transport hub serving the coordinated development of the Beijing-Tianjin-Hebei region and the integrated development of the Yangtze River Delta. Overall, the driving role of central cities in metropolitan areas is a major impetus for the integrated development of city clusters in the region and the glue that enhances their coordinated development.

		Star-graded hotels	Airplane takeoffs and landings	Passenger capacity	Freight volume	Exhibition economy	Score
1	Shanghai	49	51	47	51	51	249
2	Guangzhou	47	49	46	49	49	240
3	Chongqing	48	46	48	50	42	234
4	Beijing	51	50	49	27	50	227
5	Chengdu	40	48	51	29	46	214
6	Hangzhou	46	43	42	38	43	212
7	Shenzhen	37	47	40	36	48	208
8	Wuhan	33	42	43	46	37	201
9	Nanjing	38	40	39	42	40	199
10	Tianjin	41	32	41	45	38	197
11	Xi'an	45	44	38	25	36	188
12	Jinan	22	30	45	39	44	180
13	Qingdao	45	37	24	33	39	178
13	Guiyang	22	34	50	48	24	178
15	Kunming	29	45	34	37	25	170
16	Ningbo	42	20	33	47	26	168
17	Zhengzhou	34	39	37	20	35	165
18	Changsha	18	41	30	31	41	161
19	Hong Kong	50	38	1	22	47	158
20	Hefei	26	19	31	41	31	148
21	Shenyang	32	31	35	16	32	146
22	Xiamen	30	33	22	32	27	144
22	Suzhou	37	1	44	28	34	144
24	Nanning	18	27	32	35	19	131
25	Dalian	40	26	21	17	20	124
26	Fuzhou	18	21	20	34	30	123
27	Nanchang	27	25	23	15	28	118
28	Harbin	29	29	25	5	23	111
28	Haikou	24	36	29	8	14	111
30	Macao	43	9	9	1	45	107
31	Changchun	4	24	27	19	29	103
32	Shijiazhuang	22	15	4	43	18	102
33	Wuxi	10	17	36	21	16	100
33	Foshan	19	8	14	26	33	100
35	Yantai	35	16	17	24	7	99
36	Lanzhou	13	28	26	11	15	93
36	Xuzhou	4	12	28	44	5	93
36	Quanzhou	31	14	15	30	3	93
39	Tangshan	14	7	11	40	10	82
40	Nantong	26	11	16	18	9	80
41	Taiyuan	13	23	18	2	21	77
42	Urumqi	10	35	12	9	8	74
43	Zhuhai	24	18	13	3	12	70
44	Changzhou	13	13	19	12	12	69
45	Hohhot	6	22	2	10	13	53
46	Huizhou	5	10	8	23	6	52
47	Dongguan	7	1	6	13	22	49
48	Baoding	18	1	7	7	2	35
49	Zhongshan	2	1	3	6	17	29
50	Jiangmen	1	1	10	14	2	28
51	Zhaoqing	8	1	5	4	4	22

4. Urban resilience

With the growing role of city clusters in population and economic agglomeration, natural and social risks demonstrate a higher level of coupling and cascading effects. Building resilient cities is essential for cities to cope with risks and disasters, mitigate losses and recover quickly based on their own capabilities. The "urban resilience" dimension is designed to evaluate the level of a city's urban operations and management system and government funding. There are five variables under this dimension: "medical resources", "healthcare", "public pension", "public safety", and "disaster prevention and emergency management".

In uncertain times like the COVID-19 pandemic, major cities generally bear the brunt of slowdown due to their pivotal positioning. However, their solid economic basis and efficient urban management and service capacity can consolidate their comparative edges. Shanghai and Hong Kong tie for first place in this dimension, followed by Beijing, Shenzhen, Hangzhou, Tianjin, Macao, Guangzhou, Qingdao, Nanjing, Chongqing, and Xiamen/Ningbo (tied for 12th place). Xiamen has scaled up investments in healthcare, public safety and emergency management, focused on improving the health service system, advanced the building of a safe and resilient city, improved key infrastructure essential to livelihoods, and strengthened areas of weakness in infrastructure and public services. Ningbo sees sustained growth in GDP, reflecting its great economic resilience. The city has increased inputs and steered more resources toward areas such as healthcare and public safety, and improved risk identification and closed-loop risk management mechanisms, thus enhancing urban resilience. The "medical resources" variable is used to measure a city's medical resources and level of medical facilities with four indicators, including the number of first-class hospitals, the number of medical practitioners and the number of medical practitioners per 10,000 people, as well as the number of hospital beds and the number of hospital beds per 10,000 people. The top five cities are Chengdu, Beijing, Hangzhou, Zhengzhou and Jinan. High-quality medical resources in Chengdu have grown rapidly. The city has built a first-class hospital cluster and expanded the coverage of county-wide medical service alliances in an effort to promote the integrated development of the Chengdu Plain region. Leveraging its status as a provincial capital, Jinan has accelerated the building of a state-level regional medical centre, promoted the construction of branch hospitals or relocation of high-level hospitals to newer districts, and made more resources accessible to surrounding areas, thus achieving a balanced layout of high-quality medical resources. Thanks to its strong economic power and revenue capacity, Macao claims the top spot in "healthcare" and "public safety", and is second only to Tianjin in "disaster prevention and emergency management". In response to COVID-19 resurgences, the government of Macao SAR has adopted a series of fiscal aid measures to help individuals and businesses get through difficulties. Nantong, a new addition to our observation, ranks 10th and 14th in the "healthcare" and "disaster prevention and emergency management" variables, which is better than its ranking in the overall dimension. It has advanced towards the goal of a healthy city, improved both hard and soft infrastructure at the same time, reinforced its flood control and drainage capabilities, and optimised the river network, thus making steady headway in the building of a high-level resilient city.

"Healthcare", "public safety" and "disaster prevention and emergency management" are used to measure a city's investments in public health, safety, and other daily operations, as well as investments in emergency response and management such as pandemic prevention and control. Thanks to its strong economic power and revenue capacity, Macao claims the top spot in "healthcare" and "public safety", and is second only to Tianjin in "disaster prevention and emergency management". In response to COVID-19 resurgences, the Macao SAR government has adopted a series of fiscal aid measures to help individuals and businesses get through difficulties. Nantong, a new addition to our observation, ranks tenth and 14th in the "healthcare" and "disaster prevention and emergency management" variables, which is better than its ranking in the overall dimension. It has advanced towards the goal of a healthy city, improved both hard and soft infrastructure at the same time, reinforced its flood control and drainage capabilities, and optimised the river network, thus making steady headway in the building of a high-level resilient city.

The "public pension" variable is used to measure the level of a city's social security system using the indicator of public pension coverage. Beijing, Hong Kong, Jinan, and Chongqing seize the top four spots, and Tangshan climbs up to the fifth place. The city has pushed forward the construction of its aged care service system and given full play to the synergy of social insurance, relief and welfare policies, thus improving the basic living standards of the elderly. Qingdao, Chengdu, Changsha, and Yantai, a new addition to our observation, perform better in this variable than in the overall dimension.

Urban agglomeration and closer links among various social systems have caused the extension of disaster chains and the scope of loss. Therefore, enhancing urban resilience is key to coping with complexity and uncertainty.

		Medical resources	Healthcare	Public pension	Public safety	Disaster prevention and emergency management	Score
1	Shanghai	45	47	39	47	43	221
1	Hong Kong	25	50	50	50	46	221
3	Beijing	50	49	51	41	23	214
4	Shenzhen	23	48	45	49	47	212
5	Hangzhou	49	39	42	39	40	209
6	Tianjin	37	36	38	46	51	208
7	Macao	1	51	43	51	50	196
8	Guangzhou	44	44	25	43	37	193
9	Qingdao	36	31	46	34	45	192
10	Nanjing	43	43	8	44	42	180
11	Chongqing	40	37	48	27	25	177
12	Xiamen	8	45	37	42	39	171
12	Ningbo	20	41	31	38	41	171
14	Zhuhai	6	46	33	48	37	170
15	Suzhou	27	38	11	45	48	169
16	Wuhan	42	40	12	33	35	162
16	Jinan	47	30	49	19	17	162
18	Wuxi	19	34	15	40	50	158
19	Chengdu	51	9	41	15	32	148
20	Yantai	16	27	44	16	44	147
21	Tangshan	21	33	47	13	30	144
22	Changsha	39	6	40	22	33	140
23	Dalian	26	23	30	29	30	138
24	Xi'an	34	28	27	17	21	127
25	Nanchang	18	35	21	20	32	126
26	Shenyang	46	11	26	28	14	125
27	Nantong	11	42	3	25	38	119
28	Guiyang	32	5	17	31	30	115
29	Zhengzhou	48	12	28	6	17	111
30	Kunming	42	15	10	24	19	110
31	Changchun	33	22	36	3	12	106
32	Fuzhou	17	24	16	12	34	103
33	Shijiazhuang	30	25	22	8	12	97
33	Xuzhou	13	16	20	21	27	97
35	Urumqi	28	20	5	36	4	93
36	Foshan	9	21	7	32	21	90
36	Jiangmen	5	26	32	18	9	90
38	Taiyuan	39	3	9	11	27	89
38	Dongguan	7	1	19	37	25	89
40	Changzhou	10	32	1	30	14	87
41	Quanzhou	12	10	34	7	23	86
42	Nanning	31	18	23	10	2	84
43	Zhaoqing	2	29	24	9	19	83
44	Lanzhou	22	14	4	23	17	80
44	Baoding	24	13	35	2	6	80
46	Harbin	35	17	18	1	7	78
47	Hefei	29	7	29	5	4	74
48	Huizhou	4	19	13	26	9	71
49	Zhongshan	3	8	14	35	1	61
50	Hohhot	14	4	2	14	5	39
51	Haikou	15	2	6	4	10	37

Interview

Paths to promote the construction of resilient cities

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The 14th Five-Year Plan (2021-2025) and Vision 2035 outline the path toward building cities that are more liveable, innovative, intelligent, green, cultural, and resilient. At its core, urban development needs to effectively respond to future challenges and impacts to provide greater stability during the development process. The world has entered a period of more and more emergencies. Urban managers need to further consider and explore how cities can become more resilient towards disasters, minimise losses caused by disasters, and most effectively allocate resources to recover quickly.

Enhancing the top-level design of resilient cities to improve cities' intrinsic safety. Intrinsic safety is a safety design feature of equipment and systems to ensure that they remain safe even in the case of incorrect operation or failure. During the process of building a modern megacity, to achieve the goal of managing possible risks and putting damages that may cause under control, measures including coordination between a full-cycle management model, an optimised urban-industrial model, crisis management from the source, empowerment of multiple parties to participate in processes, and a complete governance system are needed, thus, to approach the permanent and resilient safety goal.

Strengthening the compatibility of different systems for urban infrastructure construction and planning. When planning a sponge city, attention needs to be paid to integrating urban designs with water system ecological restoration, the rejuvenation of older communities, and industrial transfer optimisation. When planning infrastructure and urban construction, consideration must be paid to environment conservation and the long-term value of land planning and protecting "blank spaces", such as the strict prohibition of damage to natural areas such as wetlands, grasslands, and forests, and the exploration of the multi-functional uses of open spaces. Exploring "reward and punishment" and coordination mechanisms for regional blank spaces together with safe production, emergency management, and resilience index can also encourage resilient thinking and regional development.

Building a multi-department coordination mechanism to promote effective governance. It is worth considering building an urban safety and management committee involving emergency management, public security, civil administration, health, water utilities led by a chief executive. It will act as the lead for coordinating and responding to natural disasters, as well as better integrate resources from across departments and use its greater authority to urge the commencement of work. Furthermore, it can effectively promote better collaboration and minimise finger-pointing and fragmented management. This committee will continue to promote the Three Decide Stipulation set forward by the Ministry of Emergency Management, continue to standardise the scope of the specifications released by the Ministry, follow unified leadership, as well as encourage more comprehensive coordination, classified management, division of responsibilities, and territorial management to establish an effective emergency management system.

Optimising the collection, sharing and use of urban digital resources. We should vigorously promote the simultaneous planning, design and promotion of smart city infrastructure and digital infrastructure and build a new pattern of smart infrastructure with the "City Brain" software system as the core. By establishing a comprehensive system for urban governance data sharing, this system can empower the fulfillment of requirements, promote data sharing and business collaboration with the demand as direction, while abiding by all relevant laws. Through the coordination of information sharing and common protection of information among different government departments, we should maintain the normal operation of urban systems and protect the security of information systems for civilian services. Furthermore, it's important for the public to participate in the management of network security, gradually form a coordinated system of network security for the whole society, and guarantee network information security, and upgrade the capacity of cities in digital governance.

Promoting reform of primary-level governance, as well as governance efficiency. The existing urban community governance system is unable to meet the increasingly complex, varied needs of society, making it more difficult to respond to emergencies. We need to actively explore the creation of a "Social governance committee" to transform communities from peripheries to hubs of management. We need to take the lead in the establishment of a resource planning and coordination mechanism, propel reform of the sub-district office system, and insist that departments responsible for statutory matters be held accountable, and that comprehensive, coordinated and reform-oriented matters are unified and centralised, to solve issues arising from scattered management and unclear responsibilities in urban and rural social development. Finally, based on the concept of combining civil and defence, and under the leadership of primary-level Party organisations, the creation of a comprehensive multi-dimensional community prevention and control system with " primary-level Party organisations, local governments and resident committees" as the main body, which is assisted by property management companies and volunteers is an important step.

5. Transportation and urban planning

Modern high-quality comprehensive transport networks provide connectivity and a basis for economic and social development. During the 14th Five-Year Plan period, cities are facing more complexity in urban transportation and changes in regional economic layout, ecological and environmental protection, demographics, factor supply models etc., which places placing new demands on public transportation systems and urban planning. There are five variables under the "transportation and urban planning" dimension. Specifically, "road resources", "bus transport", "rail transit " and "traffic efficiency" observe a city's current transportation situation from the perspectives of road infrastructure, traffic carrying capacity, congestion and traffic efficiency etc. "Green space coverage" refers to the green space coverage in built-up areas, which reflects a city's resource endowment and urban construction and planning. Xiamen, Nanjing, Foshan, and Suzhou take the top four spots in this dimension, Wuhan and Ningbo tie for fifth place, and Qingdao and Dalian tie for seventh, followed by Beijing and Wuxi. Nanjing has constantly excelled in this dimension. The city has advanced transportation infrastructure construction, planning and a high standard of management, and is designated as one of the international comprehensive transport-hub cities during the 14th Five-Year Plan period. Wuhan added three new subway lines in 2021, greatly boosting its rail transit capacity.

The Yangtze River Delta city cluster distinguishes itself in this dimension for its vision to collaborate in building integrated transportation systems through, and notable progress in building multi-tier rail transit systems centred around Shanghai, Hangzhou, Ningbo, Hefei, Suzhou, Wuxi and other central cities, and also improving the commuting network within metropolitan areas. Suzhou comes out on top in the "road resources" variable thanks to its efforts in advancing the construction of cross-regional transport networks across the city and joining unconnected road segments to fully meet people's travel needs. Other cities in the Yangtze River Delta that rank among the top ten are Nanjing, Wuxi and Changzhou. As China is working towards achieving carbon peaking and carbon neutrality goals, city clusters and metropolitan areas should embed green and low-carbon concepts in the planning and construction of transportation systems so as to develop a green urban transportation system centred on public transport. Macao, Hong Kong, Lanzhou, Urumqi, Zhuhai, Beijing and Guangzhou do well in the "bus transport" variable, securing higher rankings than in the overall dimension. Urumqi has carried out a high-quality urban renewal campaign, with over 90% of its buses powered by clean and new energy. The city continues to improve public transport services, with the aim of building a "city of green transport". The top ten cities in the "rail transit" variable are Shanghai, Beijing, Chengdu, Wuhan, Nanjing, Ningbo, Dalian, Suzhou, Shenzhen and Hangzhou, of which eight are megacities. With the increase in population density and car ownership, road resources in large cities are getting saturated and traffic congestion is getting worse. To improve the efficiency of urban transport operations and people's travel experience, megacities are working to build rapid transit networks and extend the rail transit networks of central cities to surrounding cities within metropolitan areas. In contrast, medium and large cities have sufficient space to expand their comprehensive transportation systems, giving them an edge in this regard. Zhaoqing and Changzhou seize the top two spots in the "traffic efficiency" variable, Nanchang, Nantong and Hohhot tie for third place, and Quanzhou, Baoding, Nanning, Zhengzhou and Tangshan come in sixth to tenth, all ranking higher than in the overall dimension.

The variable "green space coverage" examines the green space system planning performance of cities based on green coverage in built-up areas. The cities of Zhuhai, Foshan, Jiangmen and Dongguan in the Guangdong-Hong Kong-Macao Greater Bay Area take up four of the top ten spots. By increasing vacant green lands in line with their respective features, these four cities systematically optimised the urban ecological landscape and pushed forward both greening projects and major construction projects, thereby establishing ecological barriers for creating a beautiful and green Guangdong-Hong Kong-Macao Greater Bay Area. The northern cities Beijing, Dalian and Taiyuan also outperformed in this variable, ranking first, sixth and tenth respectively.

		Road resources	Bus transport	Rail transit	Traffic efficiency	Green space coverage	Score
1	Xiamen	38	49	19	33	47	186
2	Nanjing	46	37	47	11	43	184
3	Foshan	50	17	36	27	49	179
4	Suzhou	51	21	44	31	26	173
5	Wuhan	26	39	48	15	41	169
5	Ningbo	41	15	46	36	31	169
7	Qingdao	44	43	35	18	24	164
7	Dalian	16	44	45	13	46	164
9	Beijing	12	45	50	5	51	163
10	Wuxi	46	14	34	36	32	162
11	Zhuhai	40	46	1	23	50	160
11	Changzhou	42	11	21	50	36	160
13	Taiyuan	36	22	14	41	42	155
14	Changsha	38	24	38	8	40	148
14	Nanchang	22	18	37	49	22	148
16	Chengdu	32	23	49	6	37	147
17	Zhengzhou	31	20	32	43	15	141
18	Dongguan	48	6	12	26	45	137
19	Xi'an	43	36	33	2	21	135
19	Macao	31	51	29	21	3	135
21	Kunming	16	28	31	14	44	133
22	Hohhot	11	27	20	49	25	132
23	Jinan	48	38	16	13	16	131
23	Hefei	9	25	30	29	38	131
25	Guangzhou	9	42	40	3	33	127
26	Urumqi	20	47	13	36	9	125
26	Yantai	33	19	1	37	35	125
28	Nantong	40	5	1	49	29	124
29	Shenzhen	6	35	43	17	21	122
29	Baoding	36	1	1	45	39	122
31	Guiyang	16	31	24	22	28	121
32	Hangzhou	23	30	42	17	8	120
32	Xuzhou	18	9	27	39	27	120
34	Shijiazhuang	36	3	28	41	10	118
34	Nanning	18	12	39	44	5	118
36	Lanzhou	22	48	15	28	2	115
37	Tianjin	25	26	26	30	7	114
38	Shenyang	27	40	25	10	11	113
38	Hong Kong	1	50	41	20	1	113
40	Quanzhou	29	2	1	46	34	112
41	Tangshan	25	10	1	43	30	109
41	Jiangmen	28	7	1	25	48	109
43	Shanghai	2	34	51	7	6	100
44	Fuzhou	3	32	18	20	23	96
45	Zhaoqing	19	4	1	51	17	92
46	Chongqing	6	41	23	1	19	90
47	Haikou	49	16	1	9	13	88
48	Harbin	4	33	17	24	4	82
48	Changchun	9	29	22	4	18	82
50	Huizhou	13	8	1	39	14	75
51	Zhongshan	10	13	1	33	12	69

6. Sustainable development

The rising global population has prompted cities to tackle issues such as climate change and natural resource shortages to achieve sustainable development. During the 14th FYP period, policymaking generally emphasises the fulfilment of the "carbon peaking and carbon neutrality" goals to accelerate the socioeconomic transformation toward an environmental-friendly and green-oriented low-carbon society. Therefore, this year, the "sustainable development" dimension assesses the development and utilisation of natural resources in cities in terms of "water resources", "urban environmental protection" and "air quality", and measures the energy output efficiency and the green and low-carbon restructuring of industries through the "green and low-carbon development" variable, based on an analysis of urban population changes examined via "population mobility".

Haikou ranks first in this dimension in recognition of its remarkable achievements in the ecological civilisation campaign. Officially awarded as a national model city for the treatment of black-odorous water bodies, it has attained zero landfill from household waste and continued to head the list of Chinese cities with the best air quality. Adhering to the principle of coordinated promotion of carbon and pollution reduction, green expansion and growth, Fuzhou successfully held the BRICS Forum on Big Data for Sustainable Development last year, ranking second for its balanced performance across these variables. The following cities rank closely behind Fuzhou, all of which located in the southeast coastal regions: Guangzhou, Huizhou, Shenzhen, Nanning, Zhuhai and Foshan rank third and eighth respectively, Beijing ninth, and Chongqing and Xiamen tie for tenth.

Chongqing, Harbin, Hangzhou, Ningbo and Zhaoqing rank in the top five in the "water resources" variable, benefiting from their natural endowment as cities located along the river where the water resources management and protection system is relatively advanced. Emerging industries such as high-end manufacturing and electronic information are rising rapidly amid accelerating industrial transformation and upgrading in the Guangdong-Hong Kong-Macao Greater Bay Area. Shenzhen, Dongguan, Zhongshan, Zhuhai, Guangzhou and Foshan have attracted a large number of migrant workers, ranking among the top ten in the "population mobility" variable. Migrant workers provide effective support for the sustainable development of the urban labour forces.

"Urban environmental protection" includes two sub-indicators: the ratio of the amount of incinerated waste to the amount of safely disposed waste; and the sewage treatment rate. Baoding has been stepping up the green and low-carbon campaign and further developing waste incineration power generation projects and sewage treatment plants, hence ranking top in this variable. Zhuhai and Taiyuan follow closely behind, and cities such as Wuxi, Shijiazhuang, Shenyang, Qingdao, Quanzhou and Jinan also perform well in this variable, far higher than their dimension rankings. In recent years, Guiyang has been going all out for establishing an effective ecological barrier and making coordinated efforts to preserve and restore natural resources such as mountains, rivers, forests, fields, lakes and grasslands. It maintains a clear lead in two sub-indicators, "comprehensive air quality index" and "air quality improvement", ranking first in the "air quality" variable. Hohhot ranks among the top ten in both variables. The city has pushed ahead with ecological protection and high-quality development of the Yellow River Basin, and succeeded in eliminating severe pollution for the most part, thus establishing itself as a model city for ecological civilisation nationwide.

"Green and low-carbon development" is a new variable added this year. In order to fulfil the " carbon peaking and carbon neutrality" goals, structural transformation and upgrading of industries is one of the important means for cities to achieve carbon emission reduction. To a certain extent, energy production efficiency reflects the structural characteristics of local industries in the central cities of a region. With the optimisation of industrial structure, high-energy-consuming and high-emission industries will gradually be eliminated and replaced by rising low-energy-consuming industries. Therefore, we have adopted the regional GDP supplemented by unit electricity consumption and the urban green and low-carbon development ranking as sub-indicators to comprehensively examine the level of energy consumption caused in urban construction activities and the degree of sustainable development of industries. Beijing, Shenzhen, Guangzhou, Chengdu and Wuhan perform well in this regard. Central cities with tertiary industry as the pillar industry can produce greater economic output per unit of energy consumption, attesting to the high efficiency of energy utilisation and positive progress in economic restructuring in developed cities.

		Water resources	Urban environmental protection	Air quality	Population mobility	Green and low-carbon development	Score
1	Haikou	13	48	47	44	37	189
2	Fuzhou	41	35	45	21	41	183
3	Guangzhou	30	11	48	46	47	182
4	Huizhou	34	45	50	41	3	173
5	Shenzhen	9	27	34	51	51	172
6	Nanning	45	23	41	19	39	167
7	Zhuhai	11	50	27	48	30	166
8	Foshan	14	30	42	45	34	165
9	Beijing	39	6	34	33	51	163
10	Xiamen	3	38	27	48	44	160
10	Chongqing	51	20	37	10	42	160
12	Guiyang	27	12	51	37	30	157
13	Chengdu	43	8	19	40	46	156
14	Ningbo	48	43	11	32	21	155
15	Hohhot	4	47	44	31	25	151
16	Changsha	46	26	14	21	43	150
17	Hangzhou	49	16	6	42	36	149
18	Kunming	29	32	49	2	36	148
19	Dongguan	8	30	38	50	20	146
20	Wuxi	15	46	29	35	18	143
21	Zhaoqing	47	22	44	12	14	139
22	Nanchang	42	38	12	14	32	138
23	Quanzhou	33	41	20	16	27	137
24	Shanghai	35	9	14	38	40	136
25	Qingdao	12	41	24	18	38	133
25	Jinan	22	41	24	22	24	133
27	Zhongshan	10	26	25	49	18	128
27	Macao	1	17	36	26	48	128
29	Wuhan	32	6	4	40	45	127
29	Nanjing	16	35	21	28	27	127
29	Zhengzhou	18	36	16	35	22	127
32	Xi'an	38	19	2	37	28	124
33	Jiangmen	44	3	47	16	11	121
34	Hong Kong	6	24	36	4	49	119
35	Dalian	37	16	39	2	23	117
35	Shenyang	20	42	31	17	7	117
37	Suzhou	25	10	16	43	20	114
38	Tianjin	23	22	24	30	12	111
38	Hefei	31	13	7	27	33	111
40	Changchun	36	1	41	11	18	107
41	Shijiazhuang	26	44	17	13	4	104
41	Yantai	19	35	31	9	10	104
43	Harbin	50	4	32	7	8	101
44	Taiyuan	5	49	9	26	10	99
44	Tangshan	28	30	28	7	6	99
46	Nantong	21	32	8	5	32	98
47	Baoding	24	51	3	8	6	92
48	Changzhou	17	14	18	23	14	86
49	Xuzhou	40	8	6	4	15	73
50	Urumqi	7	18	10	30	1	66
51	Lanzhou	2	2	1	26	2	33

Interview

Highlighting the "three priorities" of Chinese urban modernisation

Shen He
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According to the report to the 20th National Congress of the Communist Party of China, China will promote urbanisation with a focus on county towns and promote the coordinated development of large, medium, and small cities by leveraging the role of city clusters and metropolitan areas. To thoroughly apply this strategic plan, we must focus on the following "three priorities".

First, observing the law of development and regarding the development of city clusters as the main direction. City clusters are the advanced spatial pattern and the leading force of urbanisation. Internationally, Europe was among the first places to achieve modernisation, in which the UK's city cluster with London at the core and the north-western European city cluster centred on Paris played significant roles. After World War II, the United States got to the forefront of modernisation, benefiting from the megalopolis in the northeastern Atlantic Seaboard centred around New York and the Great Lakes megalopolis with Chicago at the core. Into the new era, China has implemented a series of major regional strategies, such as the development of the Yangtze River Economic Belt, the coordinated development of the Beijing-Tianjin-Hebei region, the integrated development of the Yangtze River Delta, and the Guangdong-Hong Kong-Macao Greater Bay Area. The goal is to build a number of world-class city clusters to sustain the realisation of the Chinese Dream of national rejuvenation. To better build world-class city clusters, rational planning should take necessary advantages of actual conditions, the role of megacities and central cities should be brought into full play, cross-regional flows of factors should be facilitated, and great efforts should be made to boost the development of key infrastructure and strategic emerging industries underpinned by new infrastructure. All these measures serve the purpose of taking urban modernisation to the next level.

Second, capturing the characteristics of the times, consider new urbanisation as the top priority. People-centred new urbanisation is the hallmark of Chinese modernisation. Smart manufacturing is - the core of the industry 4.0 transition. This requires cities to strengthen their innovation capacity and the capability of supporting talents, bring industrial development and government services into the digital era, and accelerate the application of the Internet of Things, cloud computing, big data and other next-generation information technologies to facilitate smart urban planning, construction, management and services, and strengthen the ability for innovation-driven development. Endeavours should be carried out to promote resource conservation, environmental protection, ecological conservation and spatial layout optimisation so as to accelerate building a beautiful China. In a push for significant breakthroughs in urban modernisation, efforts should be made to promote the integrated development of urban and rural areas, industry-city integration, coordinated regional development, and multiple plans implementation in a coordinated manner. It is necessary to accelerate the pace of economic, urban, and social transformation and upgrading. Solid steps should be taken to promote innovation in social governance and to modernise the governance system and governance capabilities.

Third, strengthening weak areas with a strong focus on promoting rural vitalisation. In step with the process of urbanisation, wider attention should be paid to rural development, as rural areas are always an integral part of urban modernisation. It is imperative to help underdeveloped rural areas thrive, and bridge the urban-rural gaps, regional differences, and income gaps. Striving to achieve coordinated urban-rural development and common prosperity, promote social fairness and justice, and build a beautiful countryside as an important symbol of modernisation. The layout of rural development should be optimised. A more scientific and reasonable layout of large, medium and small cities, towns and villages should be coordinated thus increasing the efficiency of resource management and utilisation. Efforts should be made to improve rural environments; new types of urban-rural and industry-agriculture relationships should be shaped. In addition, it is necessary to inspire the vitality of rural development, comprehensively promote rural vitalisation, and move faster to build up China's strength in agriculture, thus paving the way for Chinese urban modernisation.

7. Culture and quality of life

The principle of people-oriented development should be incorporated into the entire urban governance and construction processes. Cities offering high quality of life give priority to meeting people's aspirations to live a better life. The key is to promote service-oriented consumption and create scenes of everyday life characterised by higher service quality, further diversification of services, and a more satisfying consumer experience. Culture serves as an important supporting point for improving the quality of life for the people, facilitating economic restructuring and upgrading, and stimulating the momentum for urban development. This dimension thoroughly examines the achievements made in cultural establishment in cities and the quality of life of their residents. It includes five variables: "resident income", "museums", "cinemas", "library collections" and "consumption vitality".

Overall, cultural establishment in cities and economic development are mutually promoting. All the top 15 cities in this dimension have a regional GDP above 1 trillion yuan. Shanghai, which ranks first in this dimension, outperforms all the other cities in two variables, "cinemas" and "consumption vitality". Beijing ranks first in the other two variables, "museums" and "library collections". Hangzhou, Guangzhou, Suzhou, Shenzhen, Nanjing and Wuhan rank third and eighth respectively, and Chongqing and Wuxi tie for ninth place.

The 14th FYP cultural development program emphasises the in-depth implementation of projects to inherit and develop China's excellent traditional culture, as well as the further development of cultural heritage protection, inheritance and utilisation system. Museums, as the main carrier for the dissemination of archaeological research findings and the Chinese cultural classics, play a crucial role in promoting cultural development. Therefore, this year, in addition to the variables of "cinemas" and "library collections", a new variable of "museums" has been added to observe the allocation of urban public cultural resources and service quality on a more comprehensive scale. Xi'an, Chongqing, Qingdao, Wuhan, Harbin and Tianjin rank among the top ten cities in this variable, higher than their dimension rankings. Tianjin relies on its cultural and historical heritage to actively encourage cultural consumption and increase supplies of high-quality cultural products and services. The city has also worked with other cities in the Beijing-Tianjin-Hebei region to promote the development of the "Grand Canal Cultural Belt". Tianjin also ranks among the top ten cities in the "library collections" variable.

The high-quality improvement of urban residents' living standards requires both solidifying the material foundation for the people by increasing their income as well as relying on the development of consumer service industries to improve their quality of life. The variables "resident income" and "consumption vitality" measure the potential of domestic demand in the cities and economic circulation through residents' income and consumer spending. Hong Kong, Macao, Shanghai, Beijing and Suzhou rank among the top five in the "resident income" variable. Cities in the Yangtze River Delta, such as Ningbo and Changzhou, and the southeastern coastal cities such as Xiamen, Zhuhai and Dongguan, perform well in the variable rankings, surpassing their respective dimension rankings. As for the "consumption vitality" variable, Nanjing, Qingdao, Quanzhou, Jinan, Hefei and Fuzhou rank among the top 15 cities, comparing favourably to their dimension rankings. Quanzhou (eighth place), a new city added to the survey, has been selected as a national pilot city for cultural and tourism consumption. The city actively drives the upgrading and expansion of modern service industries, focusing on building a state-level cluster of night-time cultural and tourism consumption businesses.

		Resident income	Museums	Cinemas	Library collections	Consumption vitality	Score
1	Shanghai	49	50	51	50	51	251
2	Beijing	48	51	47	51	50	247
3	Hangzhou	46	45	45	48	46	230
4	Guangzhou	45	41	46	48	47	227
5	Suzhou	47	37	44	46	48	222
6	Shenzhen	42	38	49	49	43	221
7	Nanjing	43	44	38	46	49	220
8	Wuhan	30	46	43	40	41	200
9	Chongqing	10	48	48	27	39	172
9	Wuxi	41	39	36	28	28	172
11	Qingdao	33	47	29	16	46	171
12	Chengdu	24	32	50	20	37	163
13	Tianjin	22	42	34	43	18	159
14	Ningbo	44	15	33	31	35	158
15	Changsha	35	12	39	34	36	156
16	Dongguan	37	20	40	30	28	155
17	Nantong	31	30	36	21	34	152
18	Hong Kong	51	15	17	44	20	147
18	Quanzhou	29	18	24	30	46	147
20	Fuzhou	28	25	16	39	38	146
20	Hefei	27	34	30	15	40	146
22	Shenyang	21	19	31	43	30	144
23	Jinan	32	11	19	39	42	143
24	Foshan	36	27	42	15	21	141
25	Zhengzhou	14	36	41	15	32	138
26	Xi'an	16	49	37	9	25	136
27	Changzhou	39	30	23	10	33	135
28	Macao	50	31	1	25	24	131
29	Xiamen	40	10	13	34	28	125
30	Kunming	23	33	28	15	22	121
30	Dalian	20	41	18	36	6	121
32	Nanchang	19	27	27	17	23	113
32	Yantai	26	35	12	11	29	113
34	Harbin	6	43	21	22	10	102
34	Changchun	9	24	25	36	8	102
36	Lanzhou	8	30	9	25	17	89
37	Taiyuan	4	21	10	37	15	87
38	Zhongshan	34	2	14	19	13	82
39	Tangshan	17	16	9	25	13	80
40	Nanning	5	4	23	34	13	79
41	Shijiazhuang	7	24	32	3	10	76
41	Xuzhou	3	18	20	4	31	76
43	Zhuhai	38	6	6	8	16	74
44	Guiyang	13	8	11	18	20	70
45	Haikou	11	5	3	41	8	68
46	Hohhot	25	4	6	26	4	65
47	Huizhou	18	10	15	2	15	60
48	Baoding	1	22	26	1	1	51
49	Urumqi	15	2	7	5	6	35
50	Jiangmen	12	7	4	7	2	32
51	Zhaoqing	2	15	2	6	3	28

Interview

Reflections on the services and spending economy from the perspectives of urbanisation and cities

Li Xiaojiang
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Growth of the services and spending economy is essential for achieving economic recovery, boosting confidence, and stimulating vitality in the post-Covid 19 era. It is also crucial for improving China's economic structure, optimising its economic growth model, and meeting the needs of the people for a better life.

After three decades of rapid growth, China has transformed from a low-income to an upper-middle-income country. This transformation has been accompanied by changes in the logic of urban development, migration dynamics, consumer needs, and service provision modes.

Rising incomes have enabled urban and rural residents to choose what jobs to take and where to settle down. The motivations for the flow of people in the process of urbanisation have shifted from the need for non-agricultural employment opportunities and higher incomes to seeking better access to public services and a cost-effective city to settle down. As a result, more people, especially university graduates, are attracted to cities with well-developed service sectors, higher-quality services, and relatively low costs.

On the one hand, the rising income levels have led to profound changes in consumer spending. Since the reform and opening up, China has seen a shift in how people spend money, from buying food and clothing so as to meet their basic living needs to pursuing quality and brand-name products. Furthermore, there has been a shift in what they spend money on, from products to services that improve the quality of life and offer good experiences that meet their spiritual needs. How people spend money, and what they spend it on, have both changed dramatically. On the other hand, consumer needs have become increasingly diverse and personalised due to the differentiations of preferences in terms of income, social roles, and interests. Therefore, efforts to develop the services and spending economy should be more proactive in response to the ever-growing new consumer needs. Differentiated and diversified services should be provided for different income groups, people with different roles and identities, and individuals with different preferences.

The experience of developed countries shows, when a country's economy grows to a higher level, the mainstay of the economy is inevitably to shift from primary and secondary industries to tertiary industries, which include producer services and life services. However, the proportion of consumer spending in China's economy has long been below 30 percent, which is only half that of that in developed countries and countries with the same income level. This means that Chinese consumers' spending power is not strong enough and the service sector lacks impetus for development.

The 14th Five-Year Plan has pointed the direction for optimising economic structure and reforming its fiscal and taxation systems. Through such institutional reforms, we can get rid of the reliance on capital investment for economic recovery and growth, and the reliance of local governments on income from land and real estate. This will truly mark a shift to new growth drivers, where residents' spending capacity will keep increasing and their potential will be gradually unlocked.

Local governments should appropriately understand the characteristics of local development stages, income levels of local residents, the affordability of cost of living, and spending capacity. They need to carefully analyse the spending capacity of different social groups; and effectively provide what people need in response to their preferences for products, services and experiences.

As for urbanisation, equal access to public services, especially high-quality services, should be promoted. Life services and spending economy should be fully developed to attract people with different needs and spending capacities to gather in cities and counties at different levels, thus improving the population and economic structures of small, medium-sized and large cities. Efforts should be made to develop the services and spending economy in counties, advance the urbanisation process in counties, and improve the quality of life in vast rural areas. Regions where natural and cultural heritage resources are concentrated, should be fully encouraged to more actively develop tourism, outdoor recreation, and such experience economy. Less developed regions ought to promote developing industries with distinctive local features to meet the rapidly growing consumer demand for quality experiences.

Regarding urban development, cities should be encouraged to fully develop the services and spending economy and pay special attention to the differences in consumer preferences, shifting the focus from the general public to different consumer groups. In urban planning and construction, the focus of attention should be shifted from vast spaces and grand images to people-centred scale and dynamic spaces, to create diversified places and scenarios for consumer spending. A more open approach should be adopted for urban management. The vitality of the informal economy should be embraced and the "villages" in cities and urban-rural fringe areas should be better managed and improved. An inclusive environment should be created for low and middle-income groups and new citizens to find jobs, start businesses and live decent lives. This will enable them to have higher incomes, better lives and greater spending capacity.

8. Economic clout

China's economy is still recovering from the pandemic as the country is confronted with profound and complex changes in the international economic landscape, and against the backdrop of the government's call for pushing through domestic reforms and stabilising economic development. The "economic clout" dimension, measured through variables such as "well-known enterprises", "foreign direct investment", "deposits and loans of financial institutions", "regional GDP" and "regional GDP per capita", reflects the overall economic strength and influence of the cities in response to the various risks and challenges during the current stage of economic development.

Hong Kong takes the lead in this dimension, reflecting its exceptional economic resilience and risk resistance. Hong Kong also maintains an absolute lead in other two variables: "foreign direct investment" and "regional GDP per capita". Hong Kong is followed in the dimension rankings by Shanghai and Beijing, which took the first and second places respectively in the "well-known enterprises", "deposits and loans of financial institutions" and "regional GDP" variables. Shenzhen, Hangzhou, Guangzhou, Nanjing, Suzhou, Wuhan, Chengdu and Chongqing, the top ten cities in terms of regional GDP, all received high rankings. This highlights the strong economic development momentum in the megacities, giving them comparative advantages in multiple variables.

The "well-known enterprises" variable examines the cities' appeal to investors and economic influence by assessing the number of China's top 500 enterprises headquartered in the cities respectively in 2022. Xiamen came high for this variable. The city not only gained in investment attraction, but also used "fiscal policy + financial tools" to ease liquidity difficulties for enterprises and help them achieve better development. In addition, the western city of Urumqi has made headway in the development of the core sections of the Silk Road Economic Belt focusing on stimulating industries with local characteristics as well as attracting leading enterprises to settle in the city, hence its exceptionally high variable ranking than that of the dimension ranking.

Hong Kong and Macao, as internationalised regional central cities, possess distinct geographical advantages and a highly open economic foundation. Although they have been affected to some extent by the pandemic, they still remain important hubs for international communication and economic exchange. In addition to Shenzhen and Guangzhou that play a strong leading role in the region, two other important cities in the Guangdong-Hong Kong-Macao Greater Bay Area, Foshan and Dongguan, are also widely noted for their solid economic foundations and exceptional financial service capabilities. This gives them leading positions in the "deposits and loans of financial institution" variable. With the assistance of Hong Kong and Macao as a window for foreign exchanges, Guangdong collaborates with the two special administrative regions to meet international demand, create more development opportunities, and boost the economic radiation effect of the Greater Bay Area.

The central and western regions also made consistent efforts to build a new high-level economic system for economic opening up to foreign businesses. Acting as regional financial centres, Xi'an, Wuhan, Nanchang, Changsha, Guiyang, Zhengzhou and other provincial capitals in central and western China pursued trade and investment liberalisation and facilitation in an orderly manner, actively improved the distribution of free trade zones in various regions, and perform well in the "foreign direct investment" variable, attesting to their strong appeal and development potential for foreign investors.

In terms of regional GDP per capita, the Yangtze River Delta is one of the most active, open and innovative regions in China's national economy, with economic output per capita much higher than other regions. Wuxi, Suzhou, Shanghai, Nanjing, Changzhou, Ningbo, Hangzhou and Nantong, eight cities in the Yangtze River Delta, rank among the top 15 cities in this variable. The city cluster in the Yangtze River Delta set a model for economic development, where the central cities retain their own distinctive advantages while driving the deep integration of industrial development and collaboratively pushing forward the conversion of scientific and technological research findings, thus achieving win-win cooperation and rapidly improving the standard of the overall economic development in the region.

		Well-known enterprises	Foreign direct investment	Deposits and loans of financial institutions	Regional GDP	Regional GDP per capita	Score
1	Hong Kong	49	51	49	46	51	246
2	Shanghai	50	43	51	51	46	241
3	Beijing	51	34	51	50	48	234
4	Shenzhen	48	35	48	49	44	224
5	Hangzhou	47	41	46	43	39	216
6	Guangzhou	45	26	47	48	40	206
7	Nanjing	46	29	44	41	45	205
8	Suzhou	39	30	42	45	47	203
9	Wuhan	39	46	33	42	34	194
10	Chengdu	39	38	45	44	20	186
11	Chongqing	43	36	43	47	16	185
12	Wuxi	33	23	41	37	49	183
13	Ningbo	41	18	36	39	41	175
14	Qingdao	30	40	28	38	37	173
15	Changsha	25	44	32	36	33	170
16	Tianjin	30	32	37	40	27	166
17	Xi'an	39	48	38	27	13	165
18	Jinan	41	20	36	33	29	159
19	Hefei	33	31	31	32	28	155
20	Xiamen	44	39	17	18	35	153
20	Zhengzhou	30	37	29	35	22	153
22	Foshan	39	4	41	34	31	149
23	Zhuhai	30	47	15	10	42	144
24	Changzhou	17	33	23	26	43	142
25	Nantong	17	24	26	29	38	134
26	Dongguan	25	15	39	28	23	130
27	Nanchang	30	45	13	17	24	129
27	Yantai	25	28	21	25	30	129
29	Fuzhou	25	11	24	31	36	127
30	Dalian	25	17	31	22	25	120
31	Tangshan	25	21	23	24	26	119
32	Macao	7	50	8	1	50	116
33	Kunming	39	10	18	20	15	102
34	Xuzhou	17	27	15	23	18	100
35	Shenyang	25	13	27	21	11	97
36	Taiyuan	33	3	25	14	21	96
37	Shijiazhuang	17	25	34	16	3	95
38	Quanzhou	7	7	12	30	32	88
39	Urumqi	43	1	12	8	19	83
40	Guiyang	7	42	10	11	9	79
41	Haikou	17	49	1	2	6	75
42	Baoding	25	22	16	9	1	73
43	Changchun	17	6	19	19	10	71
44	Huizhou	17	19	3	12	14	65
45	Zhongshan	17	16	7	6	12	58
46	Hohhot	17	14	2	4	17	54
47	Harbin	7	8	20	15	2	52
48	Jiangmen	17	9	7	7	8	48
49	Nanning	7	12	9	13	4	45
50	Lanzhou	7	2	4	5	7	25
50	Zhaoqing	7	5	5	3	5	25

9. Cost

The cost of living in terms of transportation and housing has become prohibitively high in recent years due to the rapid expansion of megacities and excessive population density. On the other hand, however, infrastructure construction, public service capacity and industrial development in large and medium-sized cities still need to be improved, and their appeal and growth potential remain relatively weak. How to unlock the advantages of low-cost cities, relocate certain industries from the megacities to the smaller ones, relieve the megacities of non-essential functions, and better coordinate the integrated development of urban clusters, these are urgent issues that must be solved at the next stage of regional development. In terms of "cost", we use variables related to everyday living costs such as "consumer price index", "cost of public transport" and "cost of housing rental", as well as business-related variables such as "cost of business occupancy" and "average salary" to show the overall cost of living in cities covering both types of spending.

This dimension adopts an ascending ranking method, with cities with lower costs ranking higher, to reflect the scope for growth and development potential of the low-cost cities. Tangshan, Hohhot, Baoding, Shijiazhuang, Taiyuan, Yantai and Zhaoqing receive the seven highest scores, with Lanzhou, Changchun and Quanzhou tied for eighth place.

The "consumer price index" variable uses the overall rate of change in the consumer price index from 2017 to 2021 to measure changes in local prices and the cost of living in the cities. The top five rankings go to Lanzhou, Kunming, Macao, Hong Kong and Chongqing, where fluctuations in consumer prices were relatively small and the cost of living was effectively controlled and remained relatively stable during the five-year period. Nanning, Jinan, Suzhou, Nantong and Guangzhou get got the lowest scores, indicating that these cities have witnessed a sharp rise in the local consumer price index while vigorously unlocking consumption potential.

"Cost of public transport", "cost of housing rental" and "cost of business occupancy" respectively examine cab fares, the cost of housing, and the cost of commercial properties in the cities. For "cost of housing rental" and "cost of business occupancy", Tangshan ranks first thanks to the low costs of business operation and housing properties in the city. Hong Kong ranks last in both variables, mainly due to continued steady economic growth and improved demand for rental housing in the city.

A reasonable increase in labour costs is one of the important signs of the structural upgrading and transformation of local industries towards high-end manufacturing amid socioeconomic development. The variable "average salary" measures the labour cost of a city based on the average wage level. Among densely populated cities, Beijing, Shanghai, Hong Kong and Shenzhen receive the lowest scores, indicating a positive correlation between labour costs and urban economic development. An increase in wage levels, a sign of rising labour costs, will further unlock the potential for domestic demand growth. As such, people tend to choose high-tech products and services with high-added value. New industries and new forms of business will also emerge and expand in line with the consumption upgrading. This will drive stable and healthy development of the market and the economy, providing assurances for continuous increase in labour compensation. Baoding, Shijiazhuang, Tangshan, Zhaoqing, Jiangmen and other cities that rank high in this variable still have labour cost advantage in the city clusters in the Beijing-Tianjin-Hebei region and the Guangdong-Hong Kong-Macao Greater Bay Area, allowing them to take over industries that fit their own functional positioning and development priorities, hence their strong appeals to migrant worker populations.

Sound mechanisms for cost and benefit sharing are indispensable to the integrated and coordinated development of city clusters. The interconnection of resources, collaborative creation across industries and shared environmental governance among regional cities are the prerequisites for optimising the distribution of industries amid urbanisation.

		Consumer price index	Cost of public transport	Cost of housing rental	Cost of business occupancy	Average salary	Score
1	Tangshan	28	43	51	51	46	219
2	Hohhot	39	50	47	44	37	217
3	Baoding	14	45	46	48	51	204
4	Shijiazhuang	34	41	43	34	47	199
5	Taiyuan	32	47	48	27	39	193
6	Yantai	21	31	49	49	41	191
7	Zhaoqing	29	17	45	50	45	186
8	Lanzhou	51	48	24	21	40	184
8	Changchun	43	39	33	40	29	184
8	Quanzhou	41	20	32	42	49	184
11	Harbin	42	24	28	35	50	179
12	Urumqi	36	51	40	24	24	175
12	Jiangmen	31	18	39	43	44	175
12	Xuzhou	10	26	50	46	43	175
15	Guiyang	46	36	38	26	28	174
16	Nantong	4	42	41	45	38	170
17	Chongqing	47	46	26	22	27	168
18	Shenyang	25	44	37	28	33	167
19	Kunming	50	30	29	33	23	165
20	Zhongshan	33	5	44	40	36	158
21	Zhengzhou	20	29	30	36	42	157
22	Huizhou	17	14	42	41	35	149
23	Nanchang	19	25	35	31	32	142
24	Hefei	26	33	19	32	22	132
25	Changsha	38	32	23	18	20	131
26	Foshan	22	10	31	37	30	130
27	Nanning	1	40	34	23	31	129
28	Xi'an	24	49	22	13	19	127
29	Dalian	16	38	17	25	26	122
30	Changzhou	13	11	36	47	13	120
31	Fuzhou	45	23	12	12	25	117
31	Dongguan	6	13	20	30	48	117
33	Chengdu	37	28	14	15	21	115
34	Wuxi	12	22	25	38	14	111
35	Haikou	11	37	18	7	34	107
36	Wuhan	30	34	13	12	15	104
37	Jinan	2	35	27	20	18	102
38	Zhuhai	44	8	16	16	16	100
39	Xiamen	23	19	8	20	17	87
40	Ningbo	15	12	15	29	11	82
41	Tianjin	27	15	11	17	9	79
42	Suzhou	3	27	10	15	12	67
43	Qingdao	9	16	21	10	10	66
44	Macao	49	1	2	2	5	59
45	Hong Kong	48	2	1	1	3	55
46	Shanghai	40	4	4	4	2	54
47	Nanjing	7	21	9	8	7	52
48	Beijing	35	6	3	3	1	48
49	Shenzhen	18	7	5	5	4	39
50	Guangzhou	5	9	7	6	8	35
51	Hangzhou	8	3	6	9	6	32

10. Ease of doing business

"Ease of doing business" primarily measures a city's soft power in terms of improving the business environment and various institutions. It not only directly reflects the local business development climate, economic vitality and development potential of the city, but also indirectly reveals the city's attractiveness to investors and its ability to incubate start-up companies. This dimension observes the external environment and "soft environment" in the cities for business operation and development through five variables: "entrepreneurial vigour", "reliance on foreign trade", "logistics", "fiscal balance" and "business environment". The first three variables mainly examine the innovation and entrepreneurship atmosphere, the ability to attract foreign investment, and the level of infrastructure support provided by the various policies and incentives in the cities. The latter two variables mainly reflect the ability of city managers and administrators to build and operate the cities' respective soft powers.

In this dimension, the top four cities are Shenzhen, Shanghai, Suzhou and Hangzhou. One thing that they share in common is that they achieve high rankings for all the related variables. Beijing ranks fifth in this dimension and takes the lead in the "entrepreneurial vigour" variable, which meets its strategic objective and development direction as an "international science and technology innovation centre". Several cities in the Yangtze River Delta and the Guangdong-Hong Kong-Macao Greater Bay Area achieve better performance than their overall rankings in this dimension. These economically active cities with complete commercial foundations and a friendly business environment are attractive to domestic and foreign investors. They are also the main driving forces for economic recovery. Quanzhou and Nantong, two new cities included in the survey, also achieve better performance than their overall rankings, in line with their level of economic development.

"Entrepreneurial vigour" mainly examines the number of non-state-owned listed companies and unicorn companies in the cities. Innovation and entrepreneurship are important growth drivers for urban economies, and entrepreneur-friendliness and innovative enterprise incubation capabilities reflect the overall development potential of the cities. Cities such as Changzhou, Dongguan and Zhuhai have all ranked high in this variable. In the process of industrial transformation and upgrading, the vitality of these cities has been stimulated by innovation and entrepreneurship. Hong Kong continues to take the lead in the "reliance on foreign trade" variable, highlighting its strength as an Asian financial centre. Among the high performers for this variable are Dongguan, Zhuhai, Zhongshan, Huizhou, Foshan, Jiangmen and other cities in the Greater Bay Area, where foreign trade has played a major role in maintaining steady economic growth. "Logistics" primarily measures the level of basic conditions support for commercial activities in the cities. Shijiazhuang ranks tenth in this variable, which is higher than its dimension and overall ranking. The city has delivered an impressive performance as an important node city in the national logistics hub network.

After years of intensive work, the "business environment" of Chinese cities has been optimised and improved on a comprehensive scale and business-friendliness has been greatly enhanced. With the active guidance given by the central and provincial governments and the good examples set by leading cities, most cities have streamlined and standardised administrative processes, with substantial improvement achieved in the standards of e-government services. In the future, these efforts will translate into important development opportunities for attracting enterprises and investors. Generally speaking, the construction of a business-friendly environment in the cities is a long-term strategy, which will play a crucial role in promoting post-pandemic economic recovery, revitalisation and steady urban development.

		Entrepreneurial vigour	Reliance on foreign trade	Logistics	Fiscal balance	Business environment	Score
1	Shenzhen	49	48	50	44	49	240
2	Shanghai	50	46	47	43	50	236
3	Suzhou	46	47	47	47	43	230
4	Hangzhou	48	29	49	48	46	220
5	Beijing	51	43	39	37	47	217
6	Hong Kong	33	51	29	49	51	213
7	Ningbo	39	44	44	41	30	198
8	Xiamen	43	49	28	38	39	197
9	Nanjing	45	28	30	45	48	196
10	Guangzhou	47	27	51	15	46	186
11	Wuxi	38	34	35	40	37	184
12	Dongguan	36	50	48	39	10	183
13	Qingdao	42	39	24	34	40	179
14	Chengdu	44	31	35	30	36	176
15	Tianjin	38	38	31	21	43	171
16	Changzhou	42	25	17	46	34	164
17	Zhengzhou	34	32	41	28	25	160
18	Wuhan	35	12	41	24	43	155
18	Quanzhou	21	17	45	50	22	155
20	Macao	14	41	1	51	44	151
21	Changsha	30	15	33	32	39	149
22	Hefei	28	22	38	23	32	143
23	Foshan	24	36	43	29	6	138
24	Jinan	32	10	28	33	33	136
25	Fuzhou	28	23	19	36	24	130
26	Xi'an	29	30	23	11	36	129
27	Nantong	22	24	37	16	29	128
28	Zhuhai	32	45	13	9	28	127
29	Yantai	23	33	11	35	22	124
30	Zhongshan	26	42	33	19	3	123
31	Chongqing	42	21	21	4	32	120
32	Dalian	14	37	9	27	23	110
33	Kunming	21	19	22	25	18	105
34	Shijiazhuang	18	16	43	12	14	103
35	Huizhou	14	40	21	22	5	102
36	Shenyang	8	14	25	26	18	91
37	Changchun	25	9	12	18	20	84
38	Haikou	18	18	7	31	8	82
38	Nanchang	15	13	26	8	20	82
40	Taiyuan	8	26	14	20	12	80
41	Xuzhou	19	8	16	6	27	76
42	Urumqi	14	6	6	42	4	72
43	Nanning	8	20	19	5	15	67
44	Harbin	18	3	15	1	26	63
45	Baoding	8	5	36	3	9	61
45	Jiangmen	8	35	2	14	2	61
47	Guiyang	8	4	8	17	16	53
47	Tangshan	14	11	4	13	11	53
49	Hohhot	14	2	6	7	14	43
50	Lanzhou	2	1	3	10	7	23
51	Zhaoqing	2	7	10	2	1	22

Variables

1. Intellectual capital

Enterprise expenditure on R&D

This variable uses the internal expenditure on R&D of each city's industrial enterprises above the designated size in 2021 to measure the investment level on R&D of the society. Data sources are the statistical yearbooks and science and technology bureaus of respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Scale of higher education

Higher education students are important reserves of urban human capital for the future. The number of students enrolled in the institutions of higher education in each city in 2021 is used as a measure of future human capital reserves. Data sources are the statistical yearbooks and bulletins of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

State key laboratories

This variable uses the number of various types of state key laboratories in each city to measure the infrastructure conditions and development level of the city in terms of science and technology innovation. Data are sourced from the Ministry of Science and Technology. Data for Hong Kong and Macao are obtained from public information.

Expenditure on science and technology

This variable measures the level of each city's government investment in scientific and technological research and development. It is calculated by dividing the city's 2021 fiscal expenditure on science and technology by the year-end permanent resident population. Data sources are the statistical bureaus and the financial bureaus of respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Educational level

The educational level of the population is measured by calculating the proportion of the population with a junior college degree or above to the permanent resident population and the proportion of illiterate people to the permanent resident population in each city based on the Seventh National Population Census. This variable comprehensively analyses and evaluates the overall educational level of the population in each city. Data sources are the Seventh National Population Census, the census results disclosed by the Census and Statistics Department of Hong Kong SAR, the Statistics and Census Service of Macao SAR and the 2016 UN Adult Literacy Rate, respectively.

2. Technology and innovation

Granted patents

This variable measures the level of innovation and development of each city by the number of granted patents per 10,000 people in each city. It is calculated by dividing the number of granted patents in 2021 by the year-end permanent resident population. Data for cities in the Chinese mainland are sourced from the statistical yearbooks and bulletins of respective cities. Data for Hong Kong are sourced from the Census and Statistics Department and data for Macao are sourced from the Statistics and Census Service.

High-tech enterprises

This variable selects the number of high-tech enterprises in each city as of year-end 2021 to measure each city's technological and industrial innovation capacity. Data for cities in the Chinese mainland are sourced from the statistical bulletins, government work reports and public data released by provincial and municipal-level science and technology departments.

Penetration rate of new energy vehicles

This variable measures the penetration of new-energy vehicles in each city by calculating the proportion of new-energy vehicles owned as a percentage of the total vehicles owned and the number of new-energy vehicles per thousand people. Data for cities in the Chinese mainland are sourced from the 2022 year-end figures from the Ministry of Public Security and the Dasouche cloud platform. Data for Hong Kong are sourced from the Hong Kong Transport Department and data for Macao are sourced from the Macao Statistics and Census Service.

Mobile Internet

This variable uses two sub-indicators: the proportion of mobile phone users as a percentage of the permanent population as of 2021 year-end and the new IT infrastructure in cities rankings in the 2022 China Digital City Competitiveness Research Report released by CCID Consulting. These are used to give a comprehensive measure of the development and application of Mobile Internet and digital infrastructure in cities. Data of mobile users are sourced from local statistical yearbooks and bulletins of the respective cities.

Digital cities

This variable uses two sub-indicators: rankings in the 2021 Evaluation Report on Integrated Administrative Service Capabilities of Provincial Governments and Key Cities released by the Digital Governance Research Centre of the Party School of the CPC Central Committee and the digital city rankings in the 2022 China Digital City Competitiveness Research Report released by CCID Consulting. These are used to comprehensively measure the development level of each city in terms of digital governance and digital economy.

3. Major regional cities

Star-graded hotels

This variable uses the number of star-graded hotels in each city to measure the local supply and demand and development levels of star-graded hotels. Data sources are the statistical bulletin on star-graded hotels in China released by the Ministry of Culture and Tourism in 2021, the statistical yearbooks and bulletins of respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Airplane take-offs and landings

This variable reflects demand in each city for air passengers and cargo transportation. It is based on the ranking of the number of flights landed and taken off at major airports of each city, including civil international and domestic flights, cargo flights and non-revenue flights (excluding military aircraft). Data are sourced from the 2021 National Civil Transport Airport Production Statistical Bulletin. One point is given to cities that have yet to have an airport. Data for Hong Kong are from the Civil Aviation Department of Hong Kong SAR, and data for Macao are from the statistics released by the Macao International Airport.

Passenger capacity

The passenger capacity of railroads, civil aviation, highways and water transport reflects the scale and carrying capacity of passenger transport of each city in 2021 and indirectly reflects the city's function as a regional hub. Data sources are provincial statistical yearbooks, statistical yearbooks and bulletins of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Bureau Census Service of Macao SAR.

Freight volume

Freight volume includes the total volume of freight transported by railways, civil aviation, highways, and waterways to show the scale of freight operations and carrying capacity in each city in 2021, which indirectly reflects each city's function as a regional hub. Data sources are provincial statistical yearbooks, statistical yearbooks and bulletins of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Exhibition economy

This variable refers to the exhibition economy development index, which is based on the composite index of urban exhibition development in the 2021 China Exhibition Data Statistical Report, released by the China Convention Exhibition Event Society. It aims to evaluate the development of the exhibition industry of each city. The rankings of Hong Kong and Macao are based on calculations of several indicators, such as the number of exhibitions, exhibition space, and the number of exhibition halls. Data are collected from Hong Kong's MICE industry profile released by the Hong Kong Trade Development Council, the Hong Kong Exhibition & Convention Industry Association, and the statistical yearbooks released by Macao SAR.

4. Urban resilience

Medical resources

This variable uses the total number of practising physicians, the total number of hospital beds, the number of practising physicians in the medical institutions per 10,000 residents, the number of hospital beds per 10,000 residents, and the total number of "Grade III, Level A" (i.e., top-level) hospitals in each city as sub- indicators in 2021 to comprehensively measure the overall physician resources and level of medical facilities in each city. Data sources are the statistical yearbooks and bulletins of each city, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Healthcare

This variable is used to measure per-capita healthcare expenditure in each city, by dividing the 2021 final healthcare expenditure by the year-end permanent resident population of each city. Data are collected from the statistical yearbooks and the financial bureaus of respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Public pension

This variable is defined as the proportion of the permanent resident population with basic endowment insurance, including the number of insured urban employees as well as the number of insured urban and rural residents. This variable is used to measure the development level of the basic endowment insurance as part of the public services provided in each city in 2021. Data sources are the statistical yearbooks and bulletins of each city; those of Hong Kong and Macao are collected from publicly available information.

Public safety

This variable is used to measure per-capita public safety expenditure in each city, by dividing the 2021 fiscal expenditure on public safety by the year-end permanent resident population of each city. Data are collected from the statistical yearbooks and the financial bureaus of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Disaster prevention and emergency management

This variable includes two sub-indicators, the fiscal expenditure per capita on general disaster prevention, control and emergency management, and the death toll from work accidents per 100-million-yuan worth of GDP in 2021, thus measuring the relevant fiscal spending in each city and the level of production safety. Data are collected from the financial bureaus, the emergency management bureaus, the statistical yearbooks and bulletins of respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

5. Transportation and urban planning

Road resources

This variable is used to measure the road resources and carrying capacity of urban roads in each city, by examining two sub-indicators: road area per capita and car ownership per capita in each city. Data for cities in the Chinese mainland are sourced from the 2021 China Urban Construction Statistical Yearbook, the Ministry of Public Security and the Dasouche cloud platform (2021 year-end). Data for Hong Kong are sourced from the Hong Kong Transport Department and data for Macao are sourced from the Macao Transport Bureau.

Bus transport

This variable uses the 2021 passenger volume of bus transport (or tram) per capita to measure public transport travel in each city. Data are sourced from the Ministry of Transport and the statistical yearbooks of respective cities, the Census and Statistics Department of Hong Kong SAR and the Transport Bureau of Macao SAR.

Rail transit

This variable is calculated by dividing the mileage of rail transit lines by the area of built-up land as a measure of rail transit development in every city. Data are collected from the China Urban Construction Statistical Yearbook 2021, MTR's annual report and the Planning Department of Hong Kong SAR, the Cartography and Cadastre Bureau of Macao SAR.

Traffic efficiency

This variable is based on the list of the most congested cities nationwide in the 2022 China Urban Transportation Report published by Baidu Maps and the city traffic ranking in the 2022 China Major Cities Traffic Analysis Report released by Gaode Map to measure the congestion and traffic flow efficiency in each city in a comprehensive manner. Data for Hong Kong and Macao are from sources with consistent standards.

Green space coverage

This variable uses the green space coverage rate in built-up areas from the China Urban Construction Statistical Yearbook 2021 to measure the level of green development of the built-up areas in each city. Data of Hong Kong and Macao are collected from the Planning Department of Hong Kong SAR and the Environmental Protection Bureau of Macao SAR.

6. Sustainable development

Water resources

This variable is measured by the total volume of water resources of each city in 2021 to evaluate the overall water capacity of the city, which can also indirectly reflect its capability of sustainable development. Data are collected from the bulletins from each city's water resources department, the Water Supplies Department of Hong Kong SAR and the Marine and Water Bureau of Macao SAR.

Urban environmental protection

This variable uses two sub-indicators, the sewage treatment rate, and the ratio of the amount of incinerated waste to the amount of safely disposed waste, thus measuring each city's operational efficiency for environmental protection. Data are sourced from the waste classification figures in the 2021 China Urban Construction Statistical Yearbook, the Census and Statistics Department and the Hong Kong Drainage Services Department of Hong Kong SAR, and the Statistics and Census Service and the Environmental Protection Bureau of Macao SAR.

Air quality

This variable includes two sub-indicators, air quality and air quality optimisation. Data regarding air quality are sourced from the National Urban Air Quality Report published monthly by the China National Environmental Monitoring Centre between September 2021 and August 2022. The air quality optimisation indicator reflects the improvement of air quality in each city by calculating the ranking changes in the comprehensive index. The calculation is done by subtracting each city's ranking of the comprehensive index between September 2021 and August 2022, September 2020 and August 2021. For Hong Kong and Macao, the rankings are manually calculated based on data collected from reports issued by the Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network.

Population mobility

The variable is measured by the ratio of the permanent resident population to the registered population in each city in 2021, as well as the ratio of the registered population in 2021 to that of 2020, to thoroughly reflect the inflows and outflows of the population. Data are collected from the Seventh National Population Census, the statistical yearbooks and bulletins, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Green and low-carbon development

This variable is used to comprehensively measure the energy consumption and green and low-carbon transformation trends in the industrial structure of each city, including two sub-indicators: the regional GDP divided by the total electricity consumed in 2021 and evaluations on green and low-carbon development in the Annual Report on Actions to Address Climate Change (2021), jointly released by the Chinese Academy of Social Sciences (CASS) and China Meteorological Administration. Data are sourced from the statistical bureaus of respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

7. Culture and quality of life

Resident income

This variable uses the 2021 disposable income of urban residents to measure the level of income of residents in each city. Data sources are city statistical bulletins, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Museums

This variable uses the total number of museums in each city as of 2021 year-end to measure the scale and service capabilities of each city's historical and cultural industries. Data for cities in the Chinese mainland are sourced from the statistical yearbooks and bulletins of respective cities. Data for Hong Kong are sourced from the Census and Statistics Department and data for Macao are sourced from the Statistics and Census Service.

Cinemas

This variable uses the total number of cinemas in each city by February 2023 to measure the scale and activity of the development of the movie and television culture in each city. Data are sourced from the number of cinemas published on Maoyan.com; data for Hong Kong and Macao are from publicly available statistics.

Library collections

This variable uses two sub-indicators, the total number of books in public library collections and the per capita number of books possessed in public libraries in 2021, measuring the level of public cultural resources in each city. Data are collected from the provincial statistical yearbooks, statistical yearbooks and bulletins of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Consumption vitality

This variable includes two sub-indicators, the total retail sales of consumer goods and the retail sales of consumer goods per capita in each city in 2021 to reflect the overall performance and potential of consumption in each city. Data sources are the statistical bulletins of respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

8. Economic clout

Well-known enterprises

This variable uses the number of registered headquarters of the top 500 companies in each city to measure its level of headquarters economy and its economic clout. Data are sourced from 2022's "World Top 500 list" and "China Top 500", released by Fortune's Chinese website.

Foreign investment

The variable uses the ratio of foreign direct investment to regional GDP in 2021 to evaluate the attractiveness of a city to foreign investors and the development level of its externally oriented economy. Data are sourced from the statistical yearbooks and bulletins of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Deposits and loans of financial institutions

This variable is used to measure the financial influence of each city, providing a comprehensive picture of deposits and loans of the financial institutions of each city. This measurement includes three sub-indicators of domestic and foreign currencies for financial institutions as of year-end 2021: deposit balance, loan balance and the loan-deposit ratio. Data sources are city statistical yearbooks and bulletins, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Regional GDP

This variable uses the local GDP of each city in 2021 to measure the overall scale of the city's economy. Data are sourced from the statistical yearbooks and bulletins of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Regional GDP per capita

This variable is used to measure the level of economic development in each city, using the 2021 regional GDP per capita of the permanent resident population. Data sources are the statistical yearbooks and bulletins of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

9. Cost

Consumer price index

This variable uses the overall rate of change in the consumer price index from 2017 to 2021 to measure changes in overall prices and cost of living in the five years. The observed cities are ranked in increasing order. Data are sourced from the statistical yearbooks and bulletins published by the statistics bureaus of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Bureau Census Service of Macao SAR.

Cost of public transport

This variable uses the standard fares of for-hire taxis of each city in Feb 2023, as well as its average radius of mobility, to calculate the average unit price per kilometre of taxi ride to measure the cost of local mobility. The observed cities are ranked in increasing order. Data are sourced from the development and reform commissions of respective cities, DiDi Chuxing big data and Baidu Map; those of Hong Kong and Macao come from publicly available information and data with consistent standards.

Cost of housing rental

This variable uses the average urban residential rent per square metre in each city in 2022 to measure the cost of residential housing. The observed cities are ranked in increasing order. Data are sourced from the China Real Estate Association; those of Hong Kong and Macao come from publicly available information.

Cost of business occupancy

This variable uses the average urban rent per square metre of the office buildings in the downtown area of each city in 2022 to measure the cost of commercial real estate. The observed cities are ranked in increasing order. Data are sourced from the China Real Estate Association; those of Hong Kong and Macao come from publicly available information.

Average salary

This variable uses the level of the average wage of current employees in towns and cities in 2021 to measure the cost of employment in each city. The observed cities are ranked in increasing order. Data are sourced from the National Bureau of Statistics, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

10. Ease of doing business

Entrepreneurial vigour

This variable includes three sub-indicators: the increment of non-state-owned enterprises listed as A-shares on the SSE or SZSE between 2020 and 2022 of each city, the increment of non-state-owned enterprises listed on the US stock market or SEHK, and the number of unicorns as of Feb 2023. Company-listing data are sourced from the Wind database. The number of unicorns derives from the IT Juzi start-up database.

Reliance on foreign trade

The variable uses the ratio of each city's total value of imports and exports to regional GDP in 2021 to evaluate the scale and level of development of foreign trade activities in each city, thus reflecting the level of convenience of doing business. Data are sourced from the statistical yearbooks and bulletins of the respective cities, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Logistics

This variable is used to provide comprehensive measurements for the scale and efficiency of logistics in each city. It includes two sub-indicators relating to express delivery in 2021: business volume and business volume per capita. Data are sourced from the China State Post Bureau and statistical bulletins of respective cities, the Hong Kong Census and Statistics Department and the annual report published by Macao Post.

Fiscal balance

The ratio of local general budget revenue to local general budget expenditure in 2021 is used to measure the fiscal balance. The data sources are the statistical bureaus and the financial bureaus, the Census and Statistics Department of Hong Kong SAR and the Statistics and Census Service of Macao SAR.

Business environment

This variable comprehensively measures the level of urban business environment through two sub-indicators: the 2021 Business Environment Competency Ranking of Chinese Cities in the Chinese Cities' Competitiveness Report, No.19: Megacities and Supercities: Health Benchmarks and Ideal Models, released by the National Academy of Economic Strategy, CASS; and scores received by small and medium enterprises (SMEs) in each city listed in the SME Development Environment Assessment Report 2022 released by the China Centre for Promotion of SME Development. Cities not listed in the ranking are assessed using equivalent comparable data.

Acknowledgements

The following individuals of PwC and China Development Research Foundation contributed to this report:

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For further information

In recent years, PwC has continued to track the development opportunities and the process of urbanisation of Chinese cities. We have formed a scientifically rigorous and systematic methodology and gained abundant practical experience in areas of urban and regional development strategies, comprehensive evaluation, business environment optimisation, urban resilience enhancement and sustainable urban development. We hope to provide in-depth, forward-looking analysis with practical experience in the process of China's urban development to help improve the quality of development, governance capability and sustainability of Chinese cities.

Contact us to learn more about our research methodology or practical experience in the above areas.

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