



Competitiveness Analysis on New Infrastructure Construction under the Digital Economy

Yu Xie^{1,*}

¹*Department of Commerce, University of New South Wales, Sydney, Australia*

**Corresponding author. Email: jili2237@uni.sydney.edu.au*

ABSTRACT

Since the digital economy has become a widespread tendency in China, many digital industries have started to generate. However, new infrastructure construction, which is the important pillar of these industries is not well known by people. Thus, this research uses the PEST model to analyze the trading background of new infrastructure construction and the Michael Porter diamond Model to investigate the competitiveness of seven areas of new infrastructure construction. The research shows that China highly supports new infrastructure construction by applying the 14th Five-Year Plan, value-added tax credit refund, and the special bond. In the meantime, the increase in the scale of BeiDou Navigation Satellite System users and the development of BeiDou Navigation Satellite System and 5G skill guarantee the interaction between BeiDou Navigation Satellite System and new infrastructure construction. Although the new infrastructure construction is vital in government support and relevant industry, China needs to focus more on training competent personnel and Cultivating core technology.

Keywords: *new infrastructure construction, Competitiveness, digital economy*

1. INTRODUCTION

1.1 Research Background

With the development of the digital economy, many countries usher in the fourth industrial revolution" led by artificial intelligence. Unlike the previous three industrial revolutions, the digital economy is a series of economic activities that use information and communication technology to promote production efficiency and economic structure optimization with digital information and knowledge as the cornerstone and modern communication network as the main carrier [1]. The digital economy consists of digital industrialization and industrial digitalization. Digital industrialization refers to the information industry, and industrial digitalization integrates digital technology and the real economy.

Since the digital economy is becoming widespread, the electronic lifestyle has become a popular trend in China. However, digitalization cannot exist without new infrastructure construction. According to Global Times, China has built the most significant number of 5G base stations globally in 2021 [2]. According to Xinhua, China has built more than 1.3 million 5G base stations until 2021 [3]. The extensive deployment and use of 5G base stations have ushered China into a new age of

economic growth and efficiency while still promoting technological advancement. China will deploy completely new digital infrastructure construction to further ensure the world's leading position on the scale of fiber and mobile broadband, according to the Ministry of Industry and Information Technology's 14th Five-Year Plan for the Development of Information and Communication Industry, which was released in December 2021 [3]. The new infrastructure construction can improve the hash rate and integrate with 5G technology which promotes the application of 5G technology and industrial internet. 5G base stations, Industrial internet, Ultra-high voltage (uHV), Intercity high-speed rail and urban rail transit, Electric car charging piles, Data center, and Artificial intelligence are all new infrastructure construction. New infrastructure, as the foundation of digitalization, is a national priority. The occupancy of the 5G market and the growth of integration of 5G technology and industrial internet reflect its bright prospect and development rate.

1.2 Literature Review

The construction of new infrastructure can be compared to Roosevelt's New Deal during the Great Depression of 1929 in several ways. The government

increased infrastructure construction on a vast scale, resulting in more significant employment, higher household income, and national economic progress. Ren, Xiong, Sun, et al. (2020) predicted that commercial use of 5G technology in 2025 would promote information data and terminal consumption of 810 million yuan, uHV energy would drive social investment of 223.5 billion yuan, and electric car charging piles would have a market of over 10 billion yuan [4]. As a result, new infrastructure construction has much future competitive potential and may help its industrial chain expand. On the one hand, some academics (2022) argue that creating new infrastructure encourages the flow of factor marketization and the construction of new company forms, resulting in new chances for the service trade industry [5]. On the other hand, Xiao Huilin (2020) discovered that new infrastructure construction improved the problem of asymmetric market information through Internet transmission, significantly accelerated the speed of information transmission, promoted trade cost reduction, and improved the integrated industrial structure of suppliers and dealers [6]. Meanwhile, Shen Kaiyan (2020) discovered that building new infrastructure facilitates supply-side structural adjustment in the medical and government service industries, with total information consumption reaching 6.36 trillion yuan in 2019 [7]. Various businesses can benefit from new infrastructure, and the potential for new infrastructure is more significant. Ren Zeping, Xiong Chai, Sun Wanying, et al. (2020) demonstrated that the value of the upstream and downstream industrial chain of new infrastructure construction could reach tens of trillions of dollars. However, new infrastructure accounts for a much smaller proportion of total infrastructure than old infrastructure [8]. The studies above show that effective new infrastructure construction can boost a country's economic development, but new infrastructure development will lead to local governments overinvesting in new infrastructure. Yao Kai (2021) demonstrates that the government offers excessive pricing control, service procurement, and subsidies to stimulate new infrastructure building [9]. In conclusion, the new infrastructure construction has enormous trade potential to some extent. At the same time, new infrastructure construction will promote the development of its upstream and downstream industry chains. However, the rapid development of new infrastructure construction may lead to overinvestment by the government.

1.3 Research Purpose

The existing research mainly focuses on how new infrastructure construction promotes the formation of new businesses and contributes to China's economic development through massive new industrial clusters. Few academics are now focused on new infrastructure construction itself. This research examines the

competitiveness of new infrastructure from four perspectives: production factors, demand, relevant policies and industries, government policies, and relevant businesses. This research will assist the government and related businesses in comprehending the social and policy objectives.

2. BACKGROUND OF NEW INFRASTRUCTURE CONSTRUCTION

In December 2018, the Central Economic Working Conference first discussed new infrastructure, including 5G, artificial intelligence, the Internet, and the Internet of Things. However, new infrastructure construction has evolved into the seven key sectors. The seven key sectors are 5G base stations, industrial internet, ultra-high voltage (uHV), intercity high-speed rail and urban rail transit, electric car charging piles, data center, and artificial intelligence [10]. As the new infrastructure construction expands, the industrial chain, social infrastructure, and environmental infrastructure will become part of the new infrastructure in the future.

2.1 New Infrastructure Building Is Supported By Government Behavior

The 14th Five-Year Plan for the Development of the Information and Communication Industry was released by the Ministry of Industry and Information Technology to boost China's digital infrastructure building and guide market conduct. Compared to the 13th Five-Year Plan, the 14th Five-Year Plan for the Development of the Information and Communication Industry adjusted 7 indicators and added 8 indicators. The adjustment is mainly reflected in 5G, gigabit optical networks, IPv6, mobile Internet of Things, satellite communication network, and other new-generation communication network infrastructure [11]. China will focus on establishing a new digital infrastructure to suit the digital demands of all industries according to eight new indicators in the 14th Five-Year Plan. Furthermore, the new indicators encourage the integration of new digital infrastructure and the market, the circulation and use of data resources, and the realization of digital social governance and digital services.

Moreover, the government has implemented a value-added tax (VAT) credit refund to relieve the financial pressure on enterprises. In April 2022, the tax refund amount in half a month reached 420.2 billion yuan [12]. This VAT credit refund offers a buffer time for firms' capital operations, lowering their economic stress. At the same time, it allows businesses to invest enough money in research and development and tackle significant scientific research challenges.

2.2 Dedicated Bonds Fully Support New Infrastructure

Local governments will issue special bonds to incentivize new infrastructure building and effective investment. In December 2021, the Ministry of Finance decided to issue 1.46 trillion yuan in new special bonds for 2022, which are planned to be used in urban infrastructure, rural modernization, and new infrastructure construction [13]. The special bond offers financial backing for infrastructure investments and encourages the development of artificial intelligence and big data platforms. The industrial chain can encourage a chain reaction and promote the trading number of relevant industries.

2.3 Beidou User Base Grows Significantly

The BeiDou system has grown in popularity as it has become increasingly commercialized. According to the National Bureau of Statistics, the total number of global users of the BeiDou Navigation Satellite System (BDS) has surpassed 2 billion. The overall output value of the satellite navigation and location service industry is as high as 403.3 billion yuan [14]. Many Beidou user markets currently provide a robust endogenous impetus for promoting high-quality Beidou market development. BDS technology, a part of information and communication networks, and the Internet is essential for integrating BDS and the industrial Internet. Increasing Beidou navigation can help to upgrade new infrastructure-related businesses, encourage the emergence of new businesses, and fulfill people's requirements.

2.4 Beidou Satellites And 5G Technology Increase In Scale

As the Beidou system matures, it will be able to integrate with various industries to provide Spatio-temporal reference services for each. According to data

released by the China Technical Application Association for Global Positioning System, China's Beidou sector produced 403.3 billion yuan in 2020, and it is anticipated to connect with the industrial internet in 2026, producing 670 billion yuan [15]. The BDS will promote navigation system development and integrate with 5G, the Internet of Things, artificial intelligence, and cloud computing to promote the efficient operation of new infrastructures. Besides that, it will provide precise location and information sensing for the Internet of Things, as well as spatiotemporal data for AI and cloud computing.

China has shown great potential in 5G base station buildings and technology. According to Demystifying the 5G standard-essential patent landscape with manual SEP: Phase 2, Huawei scored first in "core" standard patent holdings, accounting for 21% of all patents. Furthermore, China leads in the number of terminals and base station devices. China is presently in the lead on both base stations and 5G technology. However, it requires China to improve in core 5G technology rather than simply increasing the number of base stations to retain its leading position.

3. COMPETITIVE ANALYSIS OF THE NEW INFRASTRUCTURE CONSTRUCTION

Competitiveness used to be associated with an industry's efficiency, but competitiveness has gradually been refined into the importance of an industry in the national economy, its competitiveness, the evaluation of competitiveness, and promotion strategy [16]. Michael Porter, a Harvard University professor, established the dynamic diamond model in 1990. This model shows that a country's competitiveness can be determined by four aspects which are production factors, demand, associated industries, and government policy [17]. This paper will analyze the competitiveness of the new infrastructure construction using the four elements of the Dynamic Diamond Model.

3.1 Skills Scarcity In Essential 5G Technologies

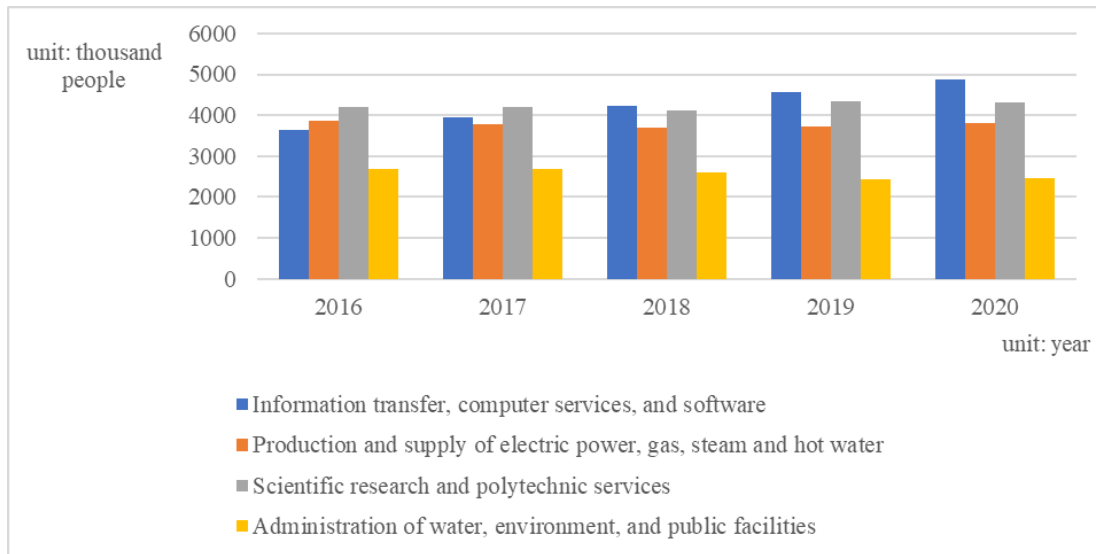


Figure 1 Number of employed persons between 2016 and 2020 (non-commercial)

(Photo credit: Original)

(Sources: China Statistical Yearbook and National Bureau of Statistics of China)

Employment in the information transmission, software, and information technology services industry increased from 3,641,000 to 4,871,000. The employment in science and technology research and technical services increased by 2.76%, while employment in electricity and water resources declined. This shows an expanding talent pool for 5G, industrial internet, massive data centers, and artificial intelligence in new infrastructure. In contrast, the talent pool for ultra-high voltage, intercity high-speed rail, and urban rail transportation is small. The growth in employment means more jobs and more labor available

for new infrastructure, which demonstrates that China has a talent advantage in new infrastructure. However, innovative technologies are the most important thing for China to lead in the market for new infrastructure construction. The China Employment Market Optimism Index (CIER) refers to the ratio of job vacancies to the number of job seekers in the job market. The CIER index for China's new infrastructure shows more significant than 1 in long run, which means that the supply of core talent for China's new infrastructure industry is less than the number of demands.

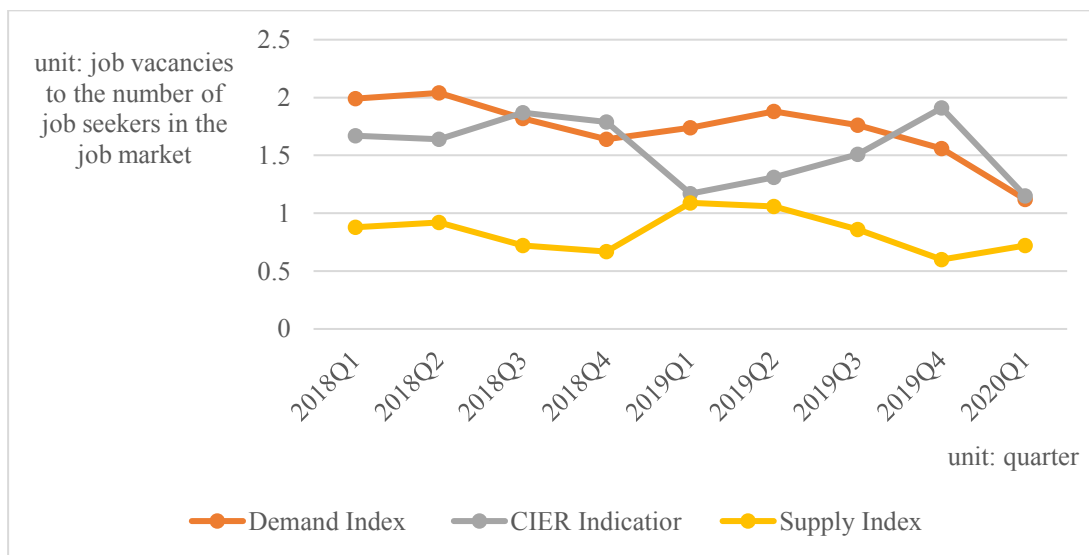


Figure 2 The scale of supply and demand for core technical talent in the new infrastructure construction (non-commercial)

(Photo credit: Original)

(Sources: GNYSE: ZPIN)

According to the "China IC Industry Talent White Paper (2019-2020 Edition)," China's industry-wide talent need would reach roughly 744,500 by 2022 which includes a deficit of up to 250,000 IC specialists. The lack of integrated circuit specialists is anticipated to have an impact on chip research and manufacture. It will lead China in a passive position in producing the 5G core base station baseband chip and Photon chip. Due to a lack of specialists, China will be unable to gain market dominance in the upstream industry of new infrastructure which results in relying on foreign suppliers. China may compete with communications technology, China may be susceptible to the competition for communications technology.

3.2 Government Accelerates Investment In New Infrastructure

Table 1. Fixed asset investment in 2021 [18]

Target	Amount
220kV and above power transformation equipment (unit: thousand kVA)	243340
Miles of new railways in operation (unit: kilometers)	4208
Miles of new high-speed rail (unit: kilometers)	2168
Miles of new highway mileage (unit: kilometers)	9028
Length of new fiber optic cable lines (unit: thousand kilometers)	3190

To stabilize the economy, the government has invested extensively in new infrastructural infrastructure. The considerable rise in fiber optic cables lays a firm basis for the new infrastructure 5G network. The length of extra high voltage lines increases from 35,868 km in 2020 to 42,160 km in 2021 which increases the extra high voltage transport distance. The completion of rails and substations demonstrates that the country's economic foundation for UHV and intercity high-speed railways, as well as urban rail transit, has improved.

Table 2. Government investment in 2021

Project	2021 investment
5G (unit: million)	184,900
Ultra-high voltage (uHV) (unit: million)	66,000
Industrial internet (unit: million)	68,000
Intercity high-speed rail and urban rail transit (unit: million)	2,229,540
Data center (unit: million)	190,000
Artificial intelligence (unit: million)	2,293,190
Total investment (unit: million)	54,454,700

(sources: National Grid Plan, China Statistical Yearbook, Qianzhan Industry

Institute, and ASKCI Consulting Co., Ltd)

The development of our new infrastructure program is focused on three main parts, which are artificial intelligence, urban rail construction, and 5G. The increase in investment partly promotes companies to spend funds on technology research and secondly nurtures the formation of new infrastructure and its related markets. In this case, the amount of investment is an important thing for the government to guide the market. The amount of money invested in the extra-high-voltage and the intercity high-speed trains are intended to provide a solid foundation for existing infrastructure while also stabilizing the economy. Corporation innovation will encourage the development of new infrastructure and its integration with public facilities, resulting in economic growth.

Compared to the United States which has stronger core competitiveness, the White House stated in the American Jobs Plan that it plans to invest 2 trillion dollars in infrastructure, primarily in the transportation and manufacturing industries. Whereas Goldman Sachs Research estimates that China will invest 15 trillion yuan in new infrastructure. This implies that China's investment will be much larger than the United States. It supports enterprises to innovate, transform and upgrade. As a result, our fixed asset investment supports the new infrastructure and ensures our competitiveness in the new infrastructure.

3.3 Keep Innovating Is The Guarantee For Advancing The New Infrastructure

Table 3. The number of new infrastructure patent applications

Year	Electronics and communications equipment manufacturing (unit: unit)	Ultra-high voltage (unit: unit)	Industrial internet (unit: unit)	Intercity high-speed rail and urban rail transit (unit: unit)	Electric car charging piles (unit: unit)	Data center (unit: unit)	Artificial intelligence (unit: unit)
2016	117749	516	819	870	3823	2426	
2017	141487	501	1029	1481	6127	2961	
2018	175923	543	1442	2199	6650	3153	96223
2019	208228	548	2831	2605	6326	3520	125604
2020	230859	70	4025	2849	7763	4644	146340
2021			1137	798	4552	3915	92728

(Sources: Qichacha, Qianzhan Industry Institute, ASKCI Consulting Co., Ltd, Warton Economic Institute, and Intelligence Research Group)

Table 3 shows that the number of patent applications in the telecommunications and communications equipment manufacturing industry is steadily increasing, indicating that China has a strong foundation in the popularity of base stations and the operation of 5G equipment. In the future, the integration of 5G information technology with other industries will also drive China's economic development. China's patent number has risen steadily in recent years, albeit it fell in 2021. The second tier of AI is led by Chinese companies Baidu, Huawei, and Tencent. In comparison to the first tier, AI in China is primarily used in industries related to AI and urban services. Such as smart healthcare, command traffic, auto autopilot, intelligent video analysis,

and big data processing. Whereas AI in the first tier has expanded into military, data sharing, academic, and commercial fields. On the one hand, China's patent volume is increasing in several fields, but there is a lack of core technology. That is, mastering core technology is a favorable factor for improving the competitiveness of China's new infrastructure. On the other hand, China's artificial intelligence application is still in its early stages, and it is critical to speed up the integration of artificial intelligence and the real economy.

3.4 New Infrastructure Market Expansion

Table 4. The market size of new infrastructure

Year	2019	2020	2021
Number of mobile phone base stations (unit: thousand)	8410	9310	9960
Rate of people using cell phones (unit: units per 100 population)	114.4	112.9	116.3
Intercity high-speed railways and urban railways are used in cargo (unit: tones)	4.39 billion	4.55 billion	4.72 billion
Intercity high-speed railways and urban railways are used for passenger (unit: people)	0.37 billion	2.2 billion	2.61 billion
Sales of new energy vehicles (unit: yuan)	120.6	136.7	352.1
Quantity of electricity transmission of uHV (unit: hundred million kilowatt-hours)	16196.99	20764.13	24415.41
Industrial Internet Market Size (unit: hundred million yuan)	6109.2	6712.7	7960.4
Artificial Intelligence Market Size (unit:	1917	2335	2902

hundred million yuan)			
Data Centre Market Size (unit: hundred million yuan)	878.3	1167.5	1500.2

(Sources: Ministry of industry and information technology of the people's republic of China, ASKCI Consulting Co., Ltd, Intelligence Research Group, and Warton Economic Institute)

With the rise in mobile phone penetration, the expansion of 5G networks has become even more critical in this era. The number of 5G base stations in China is gradually growing. This is because it benefits everyday users and facilitates the growth of artificial intelligence and the industrial internet through data transfer and analysis. With the development of additional high voltage electrical transmission, the need for intercity high-speed railroads and electricity is progressively growing, indicating the necessity to sustain the functioning of old infrastructure. At the same time, the number of new energy vehicle sales in China doubled in 2021, indicating that the new energy car charging pile has become one of China's major increasing demands. To sum up, the domestic market for new infrastructure has enormous

potential. China's artificial intelligence industry, along with the development of 5G technology and artificial intelligence, focuses on a wide range of application scenarios, including education, medical, financial, and other demand for smart city services. The design and integration of new infrastructure are also constantly meeting the nation's life needs. The superior domestic market demand can help the growth of new infrastructure, increase the level of new infrastructure development and narrow the gap between China and the other countries.

3.5 Government Promotes Relevant Policies To Drive New Infrastructure Development

Table 5. New infrastructure construction policy

The Central Economic Work Conference	Accelerating the commercial use of 5G, strengthening the construction of artificial intelligence, Internet of Things, and industrial internet. Increasing investment in intercity transportation, logistics, and municipal facilities, and filling the gap in rural infrastructure.
Report On the Work of The Government	Increasing infrastructure investment in intercity transport and strengthening the next generation of information infrastructure.
State Council's executive meeting	Local governments may use special-purpose bonds to support infrastructure development to leverage the catalytic function of investment in growing consumption.
The 12th meeting of the Central Committee for comprehensively deepening reform	Integrating traditional and new infrastructure development.
The meeting of the Central Committee of the Party	Accelerating the rapid development of 5G networks and industrial internet.
Standing Committee of the Political Bureau of the CPC	Accelerating the rapid development of 5G networks and big data center.
The "14th Five-Year Plan for National Economic and Social Development of the People's Republic of China	1. information infrastructure (5G, Internet of Things, industrial Internet, artificial intelligence, cloud computing, and blockchain) 2. convergence infrastructure (facilities formed by the combination of Internet big data and modern industry) 3. innovation infrastructure (facilities of scientific research and product development)

(Sources: China government, National Development and Reform Commission, and Western Securities Co., Ltd.)

To strengthen China's national competitiveness, the country must address its flaws and increase its advantages in terms of modernization innovation. The "14th Five-Year Plan for National Economic and Social

Development of the People's Republic of China and Outline of Vision 2035" proposed to add 3,000 km of intercity and suburban railways and build a rail transportation network. In terms of intercity and high-

speed rail, China leads the globe. Compared to other rail modes, intercity and high-speed rail can improve transport efficiency, drive the industrial and economic development of the regions along the route, and promote the expansion of the industrial scale and inter-city market transactions. Moreover, intercity and high-speed trains can help to ease passenger demand and address railway rail transportation's inadequacies.

According to the Industrial Internet Task Force Work Plan 2022, China plans to cultivate many industrial park clusters and promote the use of industrial internet by SMEs to reduce costs and increase efficiency. With 5G construction, industrial internet, and artificial intelligence

as the main development objects, China will use artificial intelligence to continuously optimize new infrastructures, such as the Internet of Things, intercity transportation, and data centers.

With policies like the 14th Five-Year Plan in place, China's construction of new infrastructure has taken on a clear development path. Furthermore, the government's attention ensures the economy's development demands and creates a favorable environment for growth.

3.6 New Infrastructure Boost New Business Generation

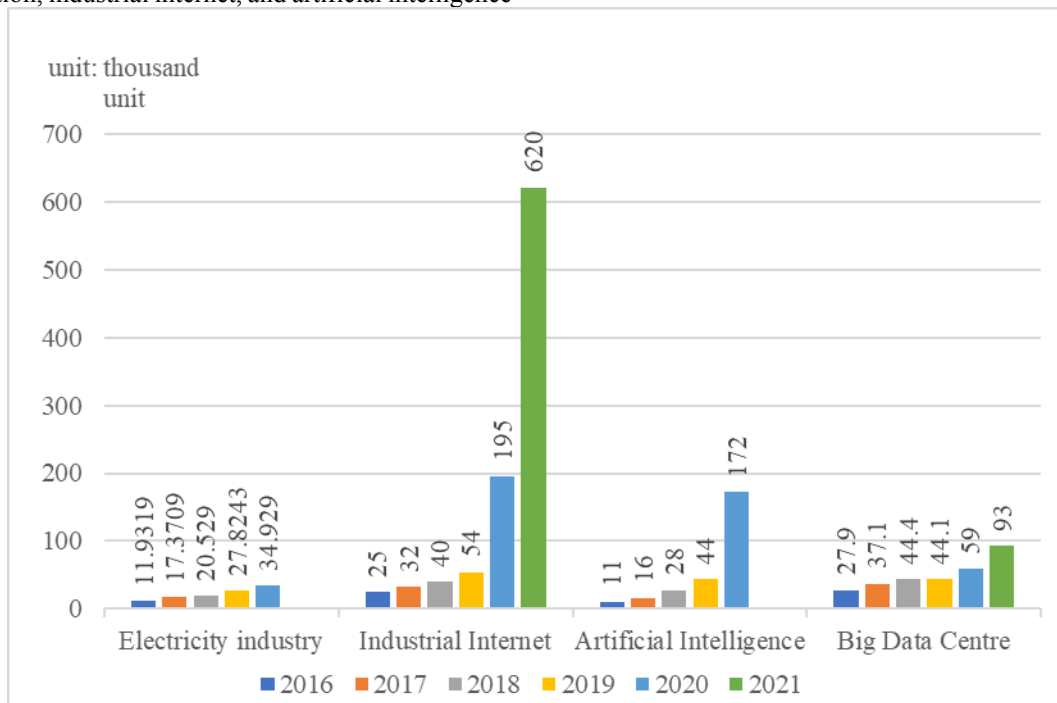


Figure 3 The number of Incremental businesses related to new infrastructure construction (non-commercial)

(Photo credit: Original)

(Sources: Qichacha and Warton Economic Institute)

Traditional industries have been altered by the digital economy. With the growth of the digital economy, digital technology, as represented by cloud computing, big data, and artificial intelligence, is critical to the establishment of new business models. Digital technology not only makes it easier to share digital resources, but also improves data transformation and human-computer interaction. As a consequence, industries that embrace digital technology not only lower manufacturing costs, but also boost productivity through human-computer interaction and data information. Given the fact that the current economy is slightly weaker, the economic benefits of digital technology continue to attract enterprises to transition and arise to varied business models. In 2021, the incremental growth of firms associated with industrial internet and artificial intelligence has accelerated, indicating that the

development of new infrastructures is also fueling the development of other enterprises in the industrial chain. Artificial intelligence (AI) is separated into three layers: the foundation layer, the technology layer, and the application layer. Each layer contains a number of businesses. Through the industrial chain, the establishment of AI and related industries form a certain industrial cluster. The foundation layer provides the hardware foundation for the industry. The technology layer is responsible for the core technology of the industry, and the application layer is downstream of the industry. Industry clusters can increase the efficiency of the application of our new infrastructure and avoid the problem of oversupply of equipment. At the same time, it stimulates innovation in related industries and provides a strong backup for our new infrastructure's competitiveness.

4. CONCLUSION

4.1 Key Findings

This paper uses Porter's diamond model to analyze the competitiveness of China's new infrastructure in terms of production factors, demand factors, policy factors, and related industries. It concludes that while China's new infrastructure is quickly growing, the country's competitiveness remains low. This is because of the deficiency of core technical skills and patented technology. China has a significant edge in terms of government investment, policy backing, and market demand. The government invests significantly more than other nations and employs tax retention refunds and special bonds to encourage the creation of new infrastructure. The massive market demand is keeping pace with the expansion of new infrastructure. On the other hand, Human resources and core patents are necessary for China to increase its competitiveness in modern infrastructure. The loss of the upstream industrial market for new infrastructure will be caused by a lack of skill and critical patents for 5G core technologies, leaving China in a passive position.

4.2 Future Studies

Even though China has the most significant number of base stations globally, the core technology is still an area where China has to develop. The core technology is the key to regaining the lead. The essential steps in attracting relevant chip talent are to offer relevant courses at colleges, organize relevant contests, boost social awareness of relevant technologies, and prepare for eventual talent training and recruiting.

With the gradual development of the new energy vehicle manufacturing industry, there is a reduction in new energy vehicle tax policy and an increase in demand. However, the number of patents for new energy vehicles is gradually decreasing. As people buy cars, the demand for charging piles continues to rise. Therefore, it is important to consider how to cover charging piles in critical parts of the country, improve charging efficiency, and ensure enough charging piles to meet the current number of new energy vehicles.

Although the government continues to invest in UHV, the intercity high-speed rail, and urban rail, the demand for these three components is growing. Furthermore, the future development of UHV, the intercity high-speed rail, and urban rail remains an issue that the government must evaluate. It should be investigated if there is an excess of investment.

REFERENCES

- [1] S. Ma, J. Liu, G. He, (2022). Powerful Country in Digital Trade: Concept Understanding, Index Construction and Potential Judgment. *International Business Research*, (01), 1-13. <https://doi:10.13680/j.cnki.ibr.2022.01.001>
- [2] Global Times. (2021, April 19). China rolls out the world's largest 5G network: MIIT. *Global Times*. <https://www.globaltimes.cn/page/202104/1221466.shtml>
- [3] Xinhua. (2021, December 20). China rolls out the world's largest 5G network: MIIT. *XinhuaNet*. http://www.news.cn/english/2021-12/20/c_1310384299.htm
- [3] News center. (2020). *Central enterprises lay out their efforts in the new infrastructure*. Chinese government. <http://www.sasac.gov.cn/n2588025/n2588119/c14097951/content.html>
- [4] Z. Ren, C. Xiong, W. Sun, et al., (2020). China New Infrastructure Research Report. *Development Research*, (04), 4-19.
- [5] S. Wang, C. Yang, (2022). Research on the Help of the High-Quality Development of the New Infrastructure Driving Chinese Service Trade. *Intertrade*, (01), 88-96. <https://doi:10.14114/j.cnki.itrade.2022.01.008>
- [6] H. Xiao, (2020). "New infrastructure" helps "double cycle" rapid transformation. *Government Finance*, (10), 20-21.
- [7] K. Shen, (2020). Thinking about China's new infrastructure macro strategy based on high quality economic development. *Jiangnan Forum*, (06), 4-6.
- [8] Z. Ren, C. Xiong, W. Sun, et al, (2020). New infrastructure, new momentum. *China Report*, (Z2), 18-28.
- [9] K. Yao, (2021). A Study of Local Government Stimulus Policies to Support New Infrastructure-based on Nvivo12 Target, instrumental two-dimensional analysis framework. *Productivity Research*, (01), 21-25+101. <https://doi:10.19374/j.cnki.14-1145/f.2021.01.004>.
- [10] Y. Liu, X. Huang, B. Shi, (2020). China's New Infrastructure Construction: Concepts, Current Situations and Problems. *Journal of Beijing University of Technology (Social Sciences Edition)*, (06), 1-12.
- [11] Ministry of Industry and Information Technology of the People's Republic of China. (2021). *fourteen-five information communication industry development plan interpretation*. http://www.gov.cn/zhengce/2021-11/16/content_5651267.htm

- [12] Xinhua. (2022). *42.02 billion yuan! The "semi-monthly report" of the large scale tax credit policy is published.* Chinese government. http://www.gov.cn/xinwen/2022-04/19/content_5686147.htm
- [13] People's Daily. (2022). *The Ministry of Finance introduced the situation of accelerating the use of government bond issuance: the progress of issuing and using special bonds this year is significantly faster than in previous years.* Chinese government. http://www.gov.cn/zhengce/2022-04/13/content_5689689.htm
- [14] GNSS & LBS Association of China. (2021). *GNSS & LBS Association of China publishes the White Paper of China Satellite Navigation and Location Services Industry Development in 2021.* <http://www.glac.org.cn/index.php?m=content&c=index&a=show&catid=1&id=7962>.
- [15] Qianzhan Industry Institute. (2021). *Analysis of China's Beidou Industry Market Status and Development Prospects in 2021. The scale of output value will grow to 670 billion yuan in 2026.* Qianzhan Industry Institute. http://www.gov.cn/xinwen/2022-04/19/content_5686147.htm
- [16] H. Zhang, J. Huang, J. Chen, (2009). Empirical Analysis of China's Services Trade Competitiveness based on "Diamond Model". *Finance & Trade Economics*, (03),83-89. <https://doi:10.19795/j.cnki.cn11-1166/f.2009.03.014>.
- [17] Y. Zhao, (2021). *Comparative analysis and influencing factors of trade competitiveness in digital services between China and India* (Master's thesis, Shanghai International Studies University). <https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202102&filename=1021065296.nh>.
- [18] National Bureau of Statistics. (2022). *Statistical Bulletin on National Economic and Social Development of the People's Republic of China in 2021.* National Bureau of Statistics. http://www.stats.gov.cn/tjsj/zxfb/202202/t20220227_1827960.html

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

