

Research on the Impact of Digital Infrastructure Construction on Urban New Quality Productive Forces

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Abstract: Cultivating and developing new quality productivity forces is a pronounced proposition for the new era. The construction of digital infrastructure furnishes a new opportunity to leverage the leading role of technological innovation and drive the growth of urban new quality productivity forces. Based on a quasi-experimental design originating from the “Broadband China” pilot initiative, this paper employs panel data from 285 Chinese cities at the prefecture level and above for the period 2005-2022 to empirically investigate the mechanism and impact of digital infrastructure construction on the development of urban new quality productivity forces. The research indicates a substantial boost to the growth of urban new quality productivity forces attributed to the establishment of digital infrastructure, a finding that withstands rigorous stability assessments. Mechanism tests indicate that digital infrastructure construction facilitates the development of urban new quality productivity forces by driving technological innovation.

Keywords: Urban New Quality Productivity Forces; Digital Infrastructure Construction; “Broadband China” Pilot Policy; Technological Innovation

1. Introduction

The new quality productive forces are driven primarily by innovation, transcending traditional methods of economic expansion and pathways of productivity development. These entities distinguish themselves through advanced technology, exceptional efficiency, and premium quality, resonating with the sophisticated productive landscape that encapsulates the innovative development paradigm. Essentially, they represent a transformative leap in the evolution of productivity.

With the continuous advancement of information technology, particularly against the backdrop of the comprehensive implementation of the "Broadband China" pilot policy, The swift advancement of digital technologies, including 5G, the Internet of Things, cloud computing, big data, and artificial intelligence, has equipped cities with more efficient and intelligent production methodologies.[1] Over the past few years, the swift growth of China's digital infrastructure has become a significant engine driving urban new quality productivity forces. The release of the "Digital China Development Report (2023)" reveals a series of remarkable data and achievements, illustrating the leapfrog improvement in digital infrastructure construction and its profound impact on the development of urban new quality productivity forces. By the end of 2023, the total number of 5G base stations across all cities in China reached 3.377 million, a year-on-year increase of 46.1%. Meanwhile, the number of Internet of Things (IoT) connections in China exceeded 170 million, and a preliminary industrial Internet platform system has taken shape, with over 200 industrial Internet platforms having considerable industry and regional influence. Amid the swift progression of extensive artificial intelligence frameworks, cities across the country are actively deploying the construction of intelligent computing centers, with smart computing power accounting for approximately 30% of the total, and plans to reach 35% by 2025. These data not only visually reflect the substantial investment in China's digital infrastructure construction but also profoundly indicate that substantial progress has been made in the transformation process in dimensions such as information productivity, innovative productivity, and green productivity. At the same time, these advanced digital infrastructures, with their powerful enabling effects, are permeating various industries and sectors, becoming the

fundamental propulsive force behind the rapid economic development of cities. Consequently, the examination and assessment of the influence exerted by the establishment of digital infrastructure on the emergence of urban new quality productivity forces possess substantial scholarly merit and practical relevance.

2. Literature Review

Since the introduction of the concept of new quality productivity forces, it has rapidly become a focal point of academic research. Through an in-depth review of the existing literature, the current state of research can be summarized as follows: Theoretically, Zhang Bin and Li Liang (2024) have clearly articulated in their research that the pivotal point of new quality productivity forces originates from cutting-edge technological advancements. It not only encapsulates the inherent necessity for realizing high-quality development but also manifests the qualitative essence of sophisticated productivity. They emphasize that continuous technological innovation and model transformation can significantly drive the optimization of the economic structure and enhance efficiency, thereby becoming a key driver of contemporary economic development. Lu Peng (2024) has delved into the intrinsic linkage mechanism between digital convergence and new quality productivity forces, revealing that the emerging digital industries, business models, and patterns spawned by digital convergence are direct manifestations of new quality productivity forces. Ma Rong [2] from Peking University (2024) argues that from the perspective of new quality productivity forces, the construction of new digital infrastructure is not only a crucial tool for promoting high-quality development but also an important lever for achieving deep industrial transformation and upgrading. With the acceleration of global economic integration, digital infrastructure, akin to the bloodstream of the modern economy, has infused fresh dynamism into the economic growth of nations and regions. China's rapid progress in this area, especially in the advancement and utilization of innovative digital infrastructure, has not only optimized population mobility and resource allocation but also facilitated the transformation and upgrading of urban

industrial structures. Empirically, Yang Fang et al. (2024) have conducted in-depth investigation utilizing information derived from publicly traded enterprises, demonstrating that corporate digital transformation can effectively empower the evolution of new quality productivity forces, accompanied by a notable enhancement in internal control quality. Yang Yang et al. (2024) have demonstrated through meticulous data examination the constructive contribution of emerging new quality productivity forces towards fostering superior economic growth. Furthermore, from the viewpoint of territorial diversity, new quality productivity forces has a pronounced effect on the high-quality economic development of non-resource-based cities and cities with high-speed rail access, while its role in cities predominantly reliant on natural resources and cities without high-speed rail access is still in a latent stage. In addition, the "2025 Report on the Development of new quality productivity forces in Chinese Cities" offers a comprehensive examination of the profound effects of emerging new quality productivity forces on urban economic systems, uncovering their substantial influence. The research indicates that the level of agglomeration of different factors is crucial to the nurturing and advancement of innovative new quality productivity forces, and there is a substantial association between new quality productivity forces and urban resilience.[3] Although existing research has yielded fruitful results, there are several areas for improvement: First, the majority of research on new quality productivity forces is qualitative, and the few quantitative studies that exist primarily focus on the provincial level, suffering from deficiencies in the scientific construction of indicators. Second, current research has not adequately addressed the dynamic stimulus of digital infrastructure construction on urban new quality productivity forces, resulting in an incomplete theoretical framework. Third, existing causal inference methods struggle to avoid endogeneity issues. In light of these shortcomings, this study aims to make the following marginal contributions: First, to develop an assessment indicator framework for emerging new quality productivity forces and perform evaluations at the Chinese municipal level. Second, to refine the theoretical model of how digital infrastructure construction

contributes to urban new quality productivity forces based on the quasi-natural experiment of the "Broadband China" pilot policy, explaining its mechanism of action through technological innovation. Third, to introduce the difference-in-differences method, with the expectation of significantly enhancing the unbiased nature of data regression and providing more precise empirical evidence.

3. Theoretical Analysis and Research Hypotheses

3.1 The Immediate Effect of Digital Infrastructure Construction on the Progression of Urban New Quality Productivity Forces.

Since the execution of the "Broadband China" strategy, our country has been gradually establishing a stable, convenient, and universally accessible new-type network layout that covers both urban and rural areas, offering affordable and high-quality services. Digital infrastructure construction, as a new form of infrastructure transformed by digitalization, transcends the limitations of traditional infrastructure and has become a key factor in fostering urban new quality productivity forces.[4] Firstly, digital infrastructure, with its technological leadership, continuously drives the iteration and upgrading of cutting-edge technologies, facilitating the evolution of mobile communication technology from 1G to 5G, thereby endowing urban communication networks with remarkable characteristics such as high speed, low latency, high reliability, and wide coverage. Moreover, the deep integration of wireless networks and embedded sensors has enabled the collection and cloud storage of massive data, providing abundant data resources for high-performance computing artificial intelligence systems in cities, enabling them to conduct in-depth data analysis and interpretation. This series of technological advancements has further propelled the continuous evolution of various urban applications, laying a solid foundation and providing strong technical support for effectively enhancing the quality of construction, operational efficiency, and service management levels across various urban sectors. Secondly, relying on its digital-driven characteristics, digital

infrastructure efficiently acquires data information through diverse channels such as sensors, cameras, and voice input systems. It achieves high-speed data transmission through industrial internet and IoT platforms, and then employs advanced algorithms and models to deeply process and analyze massive data, promoting the flow of urban data among governments, enterprises, and individuals, thereby enhancing the city's information productivity. Finally, digital infrastructure construction exhibits significant synergistic and consolidative outcomes. Rooted in the widespread of broadband networks and the rapid collection, efficient computation, precise simulation, and immediate feedback of data, it achieves deep coupling of software and hardware and organic integration across industries. This process has vigorously driven the swift advancement of nascent sectors such as e-commerce, new energy vehicles, and telemedicine, thereby giving rise to numerous new markets and demands, and bringing a large number of new employment opportunities to cities. [5] Thus, digital infrastructure construction has injected continuous momentum into the sustained growth of urban new quality productivity forces, emerging as a pivotal catalyst for urban economic transformation and upgrading. Drawing upon the preceding analysis, this study formulates Hypothesis 1.

H1: The construction of digital infrastructure promotes the growth of urban new quality productivity forces

3.2 The Collateral Effect of Digital Infrastructure Construction on the Augmentation of Urban New Quality Productivity Forces.

With the deep implementation of the "Broadband China" pilot policy, digital infrastructure construction has gradually evolved into a core pillar of technological innovation, providing fundamental support and a research and development environment, facilitating the flow and aggregation of innovation elements, and expediting the conversion and deployment of technological innovations. [6] This has had a profound effect on the enhancement of urban new quality productivity forces. Firstly, key facilities such as high-performance computers and cloud computing centers within digital infrastructure

offer powerful computing capabilities, establishing a robust groundwork for the growth of innovative experimental settings, such as virtual laboratories and industrial internet platforms, effectively reducing the costs and risks associated with technological innovation. Meanwhile, high-speed communication networks enable rapid information conveyance and instantaneous engagement, promoting the innovative development of digprovidetal technologies and markedly enhancing urban operational efficiency. Secondly, the robust construction of digital infrastructure s strong assurance for the extensive sharing and efficient circulation of data, attracting numerous innovative enterprises, research institutions, and high-end talents to urban areas, fostering vibrant innovation industrial clusters. This trend not only drives the collaborative development of technological innovation but also optimizes urban resource allocation, markedly enhancing industrial and production efficiency, and injecting strong momentum into the sophisticated advancement of the metropolitan economic sphere. Finally, the upgrading of broadband infrastructure has promoted the widespread deployment of 5G networks, fully leveraging their advantages of ultra-high speed, low latency, and high connection density, effectively supporting more complex data transmission needs. This has greatly facilitated the conversion and utilization of technological innovation outcomes within domains including urban intelligent devices and the Internet of Things, creating richer business opportunities for the integrated development of traditional and emerging industries. It has also driven the intelligentization of urban management, providing a solid technical underpinning for the digital transformation of the urban economy and the construction of smart cities. Consequently,

we present Hypothesis 2 for consideration.

H2: Digital infrastructure construction promotes the development of urban new quality productivity forces through technological innovation.

4. Research Design

4.1 Model Construction

This study treats the “Broadband China” pilot policy as an external policy perturbation and

utilizes the advanced difference-in-differences methodology to assess the effect of digital infrastructure construction on urban new quality productivity forces, further mitigating the interference of endogeneity in the model. The model is formulated as outlined below:

$$nqp_{it} = \alpha_0 + \beta treat_{it} \times period_{it} + \delta Control_{it} + \varphi_i + \lambda_t + \varepsilon_{it}$$

In this model, “nqp” represents the extent of urban new quality productivity forces. “ $treat \times period$ ” represents the policy variable indicating whether an urban area has been chosen as a pilot city for the “Broadband China” initiative. “ $treat$ ” takes the values 1 and 0 to respectively indicate whether city “ i ” is a pilot city or a non-pilot city. “ $period$ ” takes the values 1 and 0 to respectively indicate whether a city “ i ” implemented the pilot policy in the current year and thereafter, or did not implement the pilot policy in the current year. The coefficient “ β ” represents the impact of the “Broadband China” pilot cities on new quality productivity forces. “ $Control_{it}$ ” resent control variables, “ φ_i ” and “ λ_t ” are fixed effects for city “ i ” and year “ t ” respectively, and “ ε_{it} ” represents the stochastic error component inherent in the model.

4.2 Variable Selection and Measurement

4.2.1 Explained variable

New Quality Productivity Forces, “nqp”. Referencing the approach by Li Chuntao (2020) in “China Industrial Economics,” the metric for assessing the breadth of new quality productivity forces within prefecture-level municipalities is innovatively constructed using 46 keywords related to “new quality productivity forces.”

4.2.2 Explanatory variable

“The Broadband China” pilot policy, “did”. Using the Broadband China pilot policy as a quasi-natural experiment, the pilot policy is measured by the term of interaction “ $did = treat \times period$ ”. Here, the grouping dummy variable ($treat$) assigns a value of 1 to pilot cities and 0 to non-pilot cities; the time dummy variable ($period$) assigns a value of 1 to the year of policy implementation and subsequent years in pilot cities, and 0 to other years.

4.2.3 Mechanism variable

Technological innovation ($Innovp$), to ascertain the mechanism by which digital infrastructure construction facilitates the

enhancement of urban new quality productivity forces, this paper selects the level of technological innovation as the mechanism variable, measured by the number of patent applications per capita, computed as the ratio of submitted patent applications to the overall population.

4.2.4 Control variables

Utilizing pertinent scholarly investigations, variables that profoundly impact the evolution of novel qualitative productivity forces are designated as control factors. Foreign Direct Investment(*fdi*): the proportion of actual used foreign direct investment to GDP. Human Capital(*hum*): the number of college students per ten thousand people. Government Intervention(*gov*): the proportion of aggregate public budgetary outlay relative to GDP. Infrastructure Level(*lninstra*): per capita highway mileage. Marketization Level(*mar*): measured by the Fan Gang Index. Financial Development Level(*fin*): the ratio of bank deposits and loans balance to GDP.

4.3 Origins of Data and Descriptive Statistics

This study investigates the influence of digital infrastructure establishment on the

advancement of novel qualitative productivity at the municipal level, selecting panel data from 285 Chinese cities at the prefecture level and above for the years 2005-2022. The sample data are primarily sourced from the “China City Statistical Yearbook” and various municipal annual statistical bulletins.

The descriptive statistics for the main variables are presented in Table 1, covering a sample of 5130 observations. Among them, the mean of new quality productivity forces is 2.305 with a standard deviation of 1.709, indicating a significant difference in the level of new quality productivity forces across different cities and a wide distribution range. The term of interaction measuring the “Broadband China” pilot policy has a mean of 0.167 and a standard deviation of 0.373, reflecting that only 16.7% of cities participated in the pilot policy as of the sample period, and the pilot policy exerts a substantial beneficial influence on new quality productivity forces. The mean of infrastructure level is 3.325 with a standard deviation of 0.544, demonstrating noticeable uneven development of infrastructure among cities. The descriptive statistics for other variables fall within reasonable ranges.

Table 1. Descriptive Statistics

Variable	Variable Name	Obs	Mean	Std.dev.	Min	Max
<i>nqp</i>	New Quality Productivity Forces	5,130	2.305	1.709	0	6.246
<i>did</i>	“Broadband China” Pilot Policy	5,130	0.167	0.373	0	1.000
<i>fdi</i>	Foreign Investment	5,130	0.018	0.019	0	0.199
<i>hum</i>	Human Capital	5,130	0.122	0.116	0.023	1.473
<i>gov</i>	Government Intervention	5,130	0.206	0.211	0.043	0.604
<i>lninstra</i>	Infrastructure Level	5,130	3.325	0.544	0.098	6.810
<i>mar</i>	Marketization Level	5,130	0.439	0.246	0.011	1.959
<i>fin</i>	Level of Financial Development	5,130	0.024	0.012	0.005	0.213

5. Experimental Outcomes and Analysis

5.1 Benchmark Regression

This study employs the difference-in-differences approach to estimate the catalytic influence of digital infrastructure construction on new quality productivity forces. By progressively incorporating various control variables, a detailed analysis is performed to evaluate the effect of each variable on the development of novel qualitative productivity forces, accompanied by the empirical outcomes delineated within in Table 2. Equation (1) showcases the regression results

when the “Broadband China” pilot policy is used as a control variable, while Equations (2) to (7) present the regression results after adding a series of independent variables held constant including “foreign investment, human capital, government intervention, infrastructure level, marketization level, and financial development level.” Through comparative analysis, it is found that although the regression coefficients decrease after Equation (3), the impact coefficient of the “Broadband China” pilot policy on new quality productivity forces The result persists as notably affirmative at the 1% significance threshold. Additionally, Equations (1) to (7) all

include city and year fixed effects to eliminate heterogeneity across regions and time, ensuring more reliable.

Table 2. Baseline Regression Equations

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	<i>nqp</i>	<i>nqp</i>	<i>nqp</i>	<i>nqp</i>	<i>nqp</i>	<i>nqp</i>	<i>nqp</i>
<i>did</i>	0.144*** (0.028)	0.146*** (0.028)	0.137*** (0.028)	0.136*** (0.028)	0.135*** (0.028)	0.124*** (0.028)	0.125*** (0.028)
<i>fdi</i>		0.374 (0.587)	0.520 (0.588)	0.531 (0.587)	0.553 (0.595)	0.700 (0.606)	0.546 (0.608)
<i>hum</i>			0.413*** (0.150)	0.413*** (0.151)	0.413*** (0.151)	0.298** (0.149)	0.313** (0.151)
<i>gov</i>				-0.014 (0.051)	-0.013 (0.051)	-0.011 (0.052)	0.006 (0.053)
<i>lninstra</i>					-0.016 (0.041)	0.011 (0.041)	0.008 (0.041)
<i>mar</i>						0.024*** (0.004)	0.023*** (0.004)
<i>fin</i>							-0.040*** (0.014)
Constant	2.281*** (0.009)	2.274*** (0.014)	2.223*** (0.023)	2.226*** (0.025)	2.280*** (0.138)	1.143*** (0.244)	1.315*** (0.249)
City Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Observations	5,130	5,130	5,130	5,130	5,130	5,130	5,130
R-squared	0.915	0.915	0.915	0.915	0.915	0.915	0.915

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively; values in parentheses are robust standard errors.

5.2 Mechanism Testing

To further explore the effect of digital infrastructure construction on new quality productivity forces, a mechanism test as shown in Table 3 was conducted, where *Innovp* measures the level of urban technological innovation using per capita patent applications. The results indicate that technological innovation is a significant mechanism through which digital infrastructure construction fosters the enhancement of new quality productivity forces. Specifically, in Equation (1), the coefficient for the “Broadband China” pilot policy is 9.686 and is significant at the 1% level, suggesting that the policy enhances technological innovation. In Equation (2), the coefficient pertaining to technological innovation is 0.001, exhibiting significance at the 10% threshold, thereby suggesting that technological innovation exerts a contributory effect on the expansion of emergent qualitative productivity forces to a certain degree. Additionally, in Equation (2), the coefficient for the “Broadband China” pilot policy is 0.118 and is significant at the 1% level, demonstrating that the policy not only drives technological innovation but also exerts a beneficial influence on the enhancement of

new quality productivity forces. This analysis confirms Hypothesis 2, that digital infrastructure construction fosters the enhancement of urban new quality productivity forces through technological innovation.

Table 3. Mechanism Test of Technological Innovation as a Mediator for the “Broadband China” Pilot Policy in Promoting New Quality Productivity Forces

Variable	(1)	(2)
	<i>innovp</i>	<i>nqp</i>
<i>did</i>	9.686*** (0.934)	0.118*** (0.028)
<i>innovp</i>		0.001* (0.000)
<i>fdi</i>	-188.469*** (22.664)	0.685 (0.618)
<i>hum</i>	83.282*** (18.607)	0.251 (0.156)
<i>gov</i>	-5.094*** (1.936)	0.010 (0.053)
<i>lninstra</i>	-25.812*** (4.385)	0.027 (0.043)
<i>mar</i>	3.224*** (0.227)	0.020*** (0.005)
<i>fin</i>	1.122* (0.613)	-0.041*** (0.014)
Constant	-51.475*** (18.239)	1.353*** (0.248)
City Fixed Effects	YES	YES

Year Fixed Effects	YES	YES
Observations	5,130	5,130
R-squared	0.827	0.915

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively; Values in parentheses are robust standard errors.

5.3 Robustness Check

Due to the complexity of the driving factors behind new quality productivity forces, a series of robustness checks are necessary to prevent issues such as sample selection bias and variable selection errors from compromising the precision of the regression outcomes. This study utilizes an alternative indicator to construct the new quality productivity forces system, applying the same logarithmic transformation to the frequency of relevant terms as used in the previous section to assess the advancement stage of emerging new quality productivity forces. As evidenced by the empirical results in Table 4, after adding control variables, the “Broadband China” pilot policy substantially enhances the progression of new quality productivity forces at the 1% level, thereby confirming that Hypothesis 1 still holds.

Equation (1) incorporates province fixed effects and province-by-year fixed effects within the framework of the model, thereby controlling for systematic changes in macroeconomic factors. Under these conditions, although the coefficient for the “Broadband China” pilot policy has decreased compared to the baseline regression, it remains substantially positive at the 1% level. This indicates that the beneficial influence of the “Broadband China” pilot policy on new quality productivity forces is robust even after controlling for provincial-level heterogeneity and time trends, thereby confirming the original conclusion.

Equation (2) introduces additional control variables into the model, including per capita GDP and fiscal pressure, two explanatory variables strongly associated with new quality productivity forces, to mitigate the issue of omitted variable bias. Fiscal pressure is measured by the ratio of the general public budget deficit to general public budget revenue.

The empirical findings reveal that per capita GDP exhibits a statistically significant positive

relationship at the 1% significance level, suggesting that the level of economic development exerts a substantial beneficial influence on new quality productivity forces. Although fiscal pressure exhibits a pronounced negative relationship at the 10% significance threshold, indicating that it hinders the advancement of new quality productivity forces to some extent, the “Broadband China” pilot policy remains significantly positive at the 1% level, further demonstrating the robustness of the conclusion.

Table 4. Robustness Checks for the Baseline Regression Model

Variable	(1)	(2)
	nqp	nqp
<i>did</i>	0.075*** (0.029)	0.127*** (0.029)
<i>fdi</i>	-0.500 (0.768)	0.306 (0.608)
<i>hum</i>	0.346** (0.176)	0.275* (0.150)
<i>gov</i>	0.053 (0.056)	0.047 (0.057)
<i>lninstra</i>	-0.038 (0.044)	-0.001 (0.041)
<i>mar</i>	0.016*** (0.006)	0.022*** (0.004)
<i>fin</i>	0.002 (0.019)	-0.026* (0.015)
<i>lnpgdp</i>		0.108*** (0.037)
<i>fispre</i>		-0.020* (0.011)
Constant	1.650*** (0.309)	0.257 (0.492)
City Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
Province Fixed Effects	YES	NO
Province-by-year Fixed Effects	YES	NO
Observations	5,022	5,130
R-squared	0.934	0.916

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively; values in parentheses are robust standard errors.

6. Research Conclusions and Policy Implications

6.1 Research Findings

This paper constructs a theoretical framework for digital infrastructure construction to empower urban new quality productivity forces. Grounded in panel data from 285

Chinese cities at the prefecture level and above from 2005 to 2022, using the difference-in-differences method, we explore the underlying mechanism and the moderating influences of the advancement of digital foundational framework on the emergence of urban new quality productivity forces. Through mechanism testing and robustness checks, the following conclusions are drawn: Digital infrastructure construction substantially propels the furtherance of urban new quality productivity forces.[7] In addition, the fundamental process by which the development of digital infrastructure facilitates urban new quality productivity forces is technological innovation, validating the transmission chain of “digital infrastructure construction → technological innovation → urban new quality productivity forces.”

6.2 Policy Implications

First, optimize digital infrastructure to solidify the foundation for regional coordinated development. Enhance investment levels in digital infrastructure in central, western, and small to medium-sized cities, promoting full coverage of facilities such as 5G, the Internet of Things, and intelligent computing centers to narrow the "digital divide" between regions. Meanwhile, refine the facilitative framework of the “Broadband China” experimental initiative, formulating differentiated implementation plans based on local industrial characteristics. Particularly, in the developed eastern regions, concentrate on the deployment of advanced digital technology infrastructure to facilitate advancements in pioneering fields; conversely, within the core and occidental territories, give precedence to the enhancement of fundamental network coverage and the establishment of digital public service platforms, thereby strengthening their ability to accommodate industrial relocation and technological dissemination.

Second, augment the innovation ecosystem to catalyze the dynamism of technological transformation and application. Establish efficient industry-academia-research collaboration platforms, encouraging enterprises to jointly tackle core technological challenges with academic institutions and research organizations, and foster swift transformation of the latest achievements in fields such as artificial intelligence and

industrial Internet into practical applications. Additionally, further strengthen the intellectual property protection system, optimize the flow and allocation efficiency of innovation elements, and build a virtuous cycle mechanism for technological innovation, providing strong guarantees for sustained innovation.

Third, expand multi-scenario applications to unleash the multiplier effect of digital infrastructure construction. In areas such as smart manufacturing, smart cities,[8] and telemedicine, meticulously create a batch of demonstration scenarios, vigorously promote the "digital infrastructure + characteristic industry" model, effectively activating the intrinsic momentum for the upgrading of traditional industries, and thereby deepening industry integration and application. Furthermore, support enterprises in widely adopting intelligent equipment and digital management systems, driving the transformation of labor materials towards high-end and green directions, and foster the creative advancement of the platform-based economy and the shared economy. Actively explore new business models driven by data elements, infusing fresh dynamism into the advancement of the economy and society, while contributing to the holistic augmentation of urban new quality productivity forces.

References

- [1] Chen Y, Jiang C, Peng L, et al. Digital infrastructure construction and urban industrial chain resilience: Evidence from the “Broadband China” strategy. *Sustainable Cities and Society*, 2025, 121106228-106228.
- [2] Ma R. Research on the Impact of New Digital Infrastructure Construction On High-Quality Economic Development From the Perspective of New Quality Productive Forces. *J. Northwest Univ. Philos. Soc. Sci. Ed*, 2024, 54: 48-61.
- [3] Zheng J. Urban new quality productivity: horizontal measurement, spatiotemporal difference and convergence analysis. *Journal of Innovations in Economics & Management*, 2024, 5(6):66-78.
- [4] Nie J, Shen J, Ren X. Digital Infrastructure, New Digital Infrastructure, and Urban Carbon Emissions: Evidence from

- China. *Atmosphere*, 2025, 16(2):199-199.
- [5] Zheng M, Yan S, Xu S. Digital Economy, Industry - Academia - Research Collaborative Innovation, and the Development of New-Quality Productive Forces. *Sustainability*, 2025, 17(1):318-318.
- [6] He J, Mu Y, Wang C, et al. Impact of digital infrastructure construction on financial development: Evidence from the "broadband China" Strategy. *Heliyon*, 2024, 10(15):e35262-e35262.
- [7] Yao L, Li A, Yan E. Research on digital infrastructure construction empowering new quality productivity. *Scientific Reports*, 2025, 15(1):6645-6645.
- [8] Yuqi G. Research on the Impact of Digital Infrastructure Construction on Enterprise Green Transformation-Quasi-Natural Experiment Based on the Pilot Policy of "Smart City". *Journal of Economics, Business and Management*, 2024, 12(3):