



# The Influence of the Digital Economy on the High-Quality Development of the City

Jianwen Wang\*

Mechanical Design and Manufacturing Automation, Qilu Institute of Technology, Jinan, 250200, Shandong, China

\*Corresponding author: 15963681368@163.com

**Abstract.** The digital economy has emerged as a new economic era following agricultural and industrial economies due to the continuous development of communication technology. Scholars have also paid attention to the high-quality development of cities brought by the digital economy. This article explores the direct and indirect impacts of the digital economy on cities from the perspectives of enterprises, industries, society, regions, and urban spillover effects. The research reveals that the digital economy has the potential to promote high-quality development cities from multiple dimensions and aspects, playing a positive role in driving urban development.

**Keywords:** Digital Economy, City, High-Quality Development.

## 1 Introduction

The concept of the digital economy was first proposed by economist Don Tapscott[1] in 1996, initially focusing on new technologies such as computers, information and communication technology, and digital payments. With the rapid development of technologies like big data, intelligent algorithms, computing power platforms, and artificial intelligence, the concept of digital economy has been greatly expanded. As scientific and technological advancements continue, the level of digitization in various countries worldwide is constantly increasing, making the digital economy is a significant driver of global economic development.[2]

According to the "Global Digital Economy White Paper (2023)" [3] released by the China Academy of Information and Communications Technology at the 2023 Global Digital Economy Conference, in 2022, the digital economies of the world's five major countries - the United States, China, Germany, Japan, and South Korea - had a combined total of \$31 trillion. The digital economy accounted for 58% of the GDP, with a year-on-year growth of 7.6%, outpacing the GDP growth rate by 5.4 percentage points. In China, according to the "China Digital Economy Development Research Report (2023)"[4] published by the China Academy of Information and Communications Technology, the size of the digital economy in 2022 was 50.2 trillion yuan, accounting

for 41.5% of the GDP, it is a significant proportion. In the face of unprecedented challenges, the digital economy is now an essential and substantial part of the global economy, exerting a crucial influence on global development. That is why, this study examines the influence of the digital economy on urban development, drawing on prior research, covering its direct effects on cities, its influence on businesses, spill-over effects, societal impacts, effects on industrial structure, and regional implications.

## 2 The Direct Impact of the Digital Economy on Cities

Cities serve as the carriers of the digital economy, and the expansion of the digital economy will inevitably drive the high-quality development of urban economies, with a direct promoting effect in various dimensions. Currently, scholars have extensively researched the direct impact of the digital economy on cities and have obtained certain results.

Sanchez-Anguix et al.[5] found that digitization can enhance the structural composition of smart cities, facilitating city management and promoting urban economic development. Artificial intelligence strengthens disease prevention and treatment in public health. Information technology and digitization play a role in promoting traffic safety, sustainable development, and efficient energy conversion, contributing to citizen well-being and high-quality urban development. Researchers like Max N[6] studied the impact of digitization and local branding on cities, citing London's "Tech City" initiative as an example. This new approach significantly improved London's ecosystem and spurred economic growth. Bernardo[7] studied cities in Europe such as Amsterdam, Barcelona, Copenhagen, Lisbon, Manchester, and Stockholm. His research revealed that information and communication technologies, as well as network technologies, provide varying degrees of support in areas for example transportation, healthcare, education, and public safety. These technologies play a positive role in driving urban modernization, enhancing urban productivity, and promoting smart city development. Scholars like Zhao Chuanyu and others[8] studied the green productivity index and key components of the digital economy in each prefecture-level city in China from 2011 to 2019. They found that the digital economy can overcome the limitations of traditional economic development, empowering urban resource allocation and innovation in various aspects. Moreover, the growth of the digital economy significantly contributes to enhancing the overall green productivity of cities. Xu Xu and his colleagues[9] utilized a dual difference method to research the development of China's digital economy and smart cities across multiple dimensions. Their study revealed that the digital economy can effectively enhancement the development of smart cities, and smart cities can enhance high-quality city development through strengthening economic growth, increasing productivity, and promoting internet connectivity. Constructing smart cities, enhancing the integration between the digital economy and cities, serves as an effective approach to promote high-quality city economic development. Studies on Chinese cities by researchers like Zhao Tao, Zhang Zhi and Liang

Shangkun[10] found that digitization promotes urban environmental sustainability, enhances entrepreneurial capabilities, overall urban productivity, and effectively stimulates regional economic growth.

### **3 The Impact of the Digital Economy on Businesses**

Businesses are the vital source of energy for urban economic development and are an indispensable and significant asset to a city. The digital economy can drive innovation, transformation, and sustainable development of businesses, serving as a necessary path for structural reform and innovative growth.

From a qualitative perspective, Farboodi M[11] conducted research on the impact of long-term the growth of technology in financial data on market efficiency by constructing an information selection model for the global financial markets. The study indicates that "big data" financial technology is an important information resource. With the advancement of the digital economy and data processing technology, businesses will acquire more data and improve production efficiency. Jun Z and others[12] used the fuzzy set qualitative comparative analysis method to analyze data from Chinese manufacturing companies listed from 2015 to 2020. The research found that in the era of the digital economy, the improvement of the digital economy level can effectively promote business economic development and drive the success of enterprise service orientation.

From a quantitative perspective, researchers like Müller[13] used econometric methods to study 814 American companies and found that the digital economy can significantly improve productivity, especially for information technology-intensive companies. Zhiqiang Z and others[14] analyzed panel data from Chinese A-share listed companies, revealing that the digital economy can enhance companies' sustainability and innovation capabilities, as well as drive innovation activities at the city and regional levels, elevating urban innovation and economic development. Studies by Leo-Paul D and others[15] randomly selected 315 relatively active technology-based enterprises in Tehran according to Cochran's formula for research, and analyzed them using Structural Equation Modeling (SEM) and Partial Least Squares (PLS) method. They found that digitalization can enhance the sustainable development of enterprises, drive innovation transformation, and promote the commercial development of cities and the construction of smart cities. Through both quantitative and qualitative studies, it was confirmed that under the context of smart cities, the use of digital economy can better enhance the innovation and sustainable development capabilities of enterprises, improve their own capabilities, leading to better development of enterprises and promoting urban development.

### **4 The Impact of Digital Economy on Regions**

Cities form regions, and these regions in turn influence cities. The impact of the digital economy on regions is multifaceted, bringing about positive effects such as economic growth, industrial upgrading, employment opportunities, and social development. The

prosperity of regional development also to some extent affects the economic development of cities within the region.

Research conducted by Vu M K[16] using Singapore as a sample found that information and communication technology significantly boosts labor productivity in Singapore. The positive impact of the digital economy on Singapore's economy continues to strengthen over time. Additionally, research by Yue et al. [17] suggests that Singapore's strategic positioning as a regional hub for information and communication technology has accelerated its recent advancements in digitalization, thereby enhancing its commercial development. Ding L, Haynes K[18] conducted a study in China and concluded that the construction and improvement of digital infrastructure can promote regional economic development. Regions in the early stages of development may benefit the most from investments in telecommunications infrastructure, which also contributes to regional balanced development. Thompson G H[19], using 43 countries including the United States and India as samples, compared the economic impact of digital infrastructure development on these countries and found that digitization has a significant impact on economic growth across all countries. However, the economic stimulation effects of digitization and information technology are more pronounced in low-income countries and regions compared to high-income countries and regions. Therefore, for low-income countries and regions, digitization and information technology offer more benefits, potentially narrowing the income gap with high-income countries and regions. Huining, Baisi, and others[20] used panel data from 30 regions in China from 2006 to 2017 as samples. By constructing fixed effects and mediating effect models, they found that the Internet has a positive impact on regional innovation capabilities, and this effect is notably sustainable. It can accelerate the urbanization process, enhance regional transformation capabilities, and drive urban and regional economic development. Research results from Xu Xiaohui[21] indicate that digitization and information technology have a positive impact on the high-quality economic development of both developed and underdeveloped regions in China, promoting high-quality economic development in urban areas. Nevertheless, the impact is more significant in relatively developed regions and less pronounced in underdeveloped regions.

## 5 The Impact of the Digital Economy on Society

People are the soul of urban development, and cities belong to people. Only by centering around people can a city continue to develop and thrive. As a new primary economic form, the digital economy has profound effects on individuals and society.

Ana Á S[22] found in her research on Internet usage in Spain and people's happiness that the development of the Internet and digitization can enhance personal connections and social participation, to some extent improving people's living standards and residents' happiness. Evgenievich S B and others[23] studied the impact of digitization on economic, environmental, and social progress, revealing that Internet and digital transformation can promote environmental and social progress, enhancing the quality of life for the Chinese people. Wang Song and colleagues[24], using China's CGSS data from

2011 to 2018 and the digital economic development index at the provincial level, discovered that digital economic development can increase residents' income, reduce environmental pollution, and significantly improve the happiness of Chinese residents.

However, some scholars argue that while digitization brings benefits to people, it also generates certain social issues. Research by Teresa M B[25] and others on over 5000 companies of various sizes in Spain from 1991 to 2016 revealed that digitization and automation have effectively reduced costs, promoted production efficiency, and capacity development for businesses. However, they have also led to a long-term reduction in the workforce due to digitization and automation. In the long run, this has had a certain degree of negative impact on employment for the people. Similarly, Frey B C and Osborne A M[26] found through their research on employment and regions in the United States that digitization and information technology will put some workers at risk of layoffs. As the levels of digitization and information technology continue to rise, the prices of digital products will continuously decrease, effectively replacing low-end labor to some extent. ZHANG Xiaohan and others[27] conducted a study on the impact of the digital economy on entrepreneurship based on the 2017 China Migrant Dynamic Survey (CMDS) data and calculated digital economic index. They found that the digital economy has a significant negative impact on the entrepreneurial activities of rural migrant workers coming to cities, exerting a certain inhibitory effect on achieving common prosperity between urban and rural areas.

## 6 The Impact of the Digital Economy on Industrial Structure

The rise and fall of industries have always been closely related to the economic structure of cities. The emergence of industries has driven the development of modern cities, and urban development has also promoted the upgrading of industries. In today's highly digitized world, the development of industrial structure is inevitably influenced by the digital economy.

Wang Meijuan and others[28] based on research on data from Chinese manufacturing listed companies from 2001 to 2020 found that digital development has shifted the industry's focus from "cost + labor" to "information + technology." The digital economy has promoted the integration of industrialization and digitization by reducing costs, increasing market potential, and enhancing innovation capabilities, thus driving economic development. Nicos K[29] analyzed the approaches to digitalization and green transformation from the perspectives of digital transformation, green transformation, systemic innovation, industrial ecosystem, and transformation, finding that digitalization can not only drive the green transformation, digital transformation, and innovative development of industries in cities and regions but also optimize the industrial ecosystem structure of cities and regions, forming new urban ecosystems that promote the co-development of industries and cities. Á. G and others[30] studied the metropolitan network of Bogotá and higher education industry, discovering that digital technologies create a new educational environment, facilitating educational transformation through user interactive experiences and inclusivity to advance the education industry

from the perspective of smart cities. Olga V. [31], through her research on the digital economy and the Russian postal industry, found that the digital economy, utilizing information and communication technology, enables more rational resource utilization. Big data technology facilitates the easier organization, storage, and summarization of data, making urban postal departments more intelligent and digitalized, thereby driving the development of smart cities. Zhang C's[32] research on manufacturing and digitalization in Suzhou showed that digitalization and information technology can accelerate the development of manufacturing, transforming Suzhou from "Suzhou Manufacturing" to "Suzhou Intelligent Manufacturing," driving the upgrade of the manufacturing industry. Li Kairui and others[33] studied panel data from 41 cities in the Yangtze River Delta region of China from 2012 to 2021, finding that the digital economy, through the coordinated development of industry chains, innovation chains, and value chains, is a crucial way to promote industrial structural upgrading and city economic development. Through research, Xu Xu and his team[9] have discovered that the development of the digital economy can accelerate the process of building smart cities, effectively promoting the high-quality development of the circulation industry. The digital economy is also an important way to promote the upgrading of industrial structure and the ecological and economic transformation. The upgrading of industrial structure driven by the digital economy is a key method to enhance urban ecological efficiency and is an effective approach to promoting high-quality economic development in cities.

From the perspective of industry productivity, Hayes R M and Erickson T[34] found through data analysis that information technology can effectively improve industrial profit margins and production efficiency, serving as an important pathway for promoting economic growth. Liu J and Zhao Q[35] analyzed inter-provincial industrial data from China between 2008 and 2021, revealing that the digital economy can not only reduce pollution but also enhance industrial resource utilization, increase production efficiency, and thereby drive sustainable economic development. Research by Sun Linlin and others[36] indicates that information and digitization promote Chinese economic growth through two main paths: capital deepening brought about by ICT and comprehensive improvement in total factor productivity of the ICT manufacturing industry. Long Fei's[37] study demonstrates that promoting industrial optimization and upgrading through information transforms industries from a low to a high level, smartly transforming industries and enhancing production efficiency, effectively driving the transformation and development of the economic structure.

## **7 The Impact of the Digital Economy on Spillover Effects**

As modern cities continue to develop, spatial spillover effects have become an important factor influencing urban economic growth. Digitization plays a positive role in promoting urban spatial spillover effects.

Researchers Bekkerman A and Gilpin G[38] found through their study in the United States that high-speed internet has significant spillover effects, providing advantages in knowledge and resource flow to neighboring cities and regions. In metropolitan areas, these spillover effects are more pronounced, exerting a more significant driving force

on the economy. Sohn, Kim, and Hewings[39] compared the relationship between digitization and urban spatial structure in Chicago and Seoul, discovering a clear spillover effect of information technology on Chicago and its surrounding areas, along with a distinct complementary relationship between digitalization and urban structure. Zhou Q[40] and others analyzed data from 330 cities in China from 2011 to 2020 from the perspective of regional innovation systems, revealing that the digital economy significantly promotes urban innovation capabilities and cities can radiate to other cities through extensive cooperation networks. Xu Xiaohui and others[21] conducted a study on data from Multiple cities in China, finding that the digital economy not only significantly promotes high-quality development of local urban economies but also that the promotion of the urban economy by the digital economy is related to the size of the city; compared to large cities, the impact of the digital economy is more noticeable in small cities. Hui Ning, Bai Si[20] studied 30 provinces and cities in China as samples, revealing a strong innovation spillover effect of the internet that can robustly enhance regional innovation capabilities and to some extent indirectly promote urbanization and urban development. Jin Huan, Yu Lihong[41] believe that the digital economy and the internet have a significant promoting effect on the level of urban innovation. Furthermore, while promoting local innovation development, the digital economy also has a certain radiation effect on neighboring areas, fostering joint innovation development in surrounding cities and regions.

## 8 Conclusion and Prospects for Research

In today's highly developed information age, the development of the digital economy has become inevitable. As a crucial driver of the current world economy, on a macro level, the digital economy can promote industrial transformation, smart city construction, and facilitate the coordinated development of regional economies. On a micro level, the digital economy can enhance enterprise productivity, drive innovation, and improve residents' quality of life and happiness. It can be said that the digital economy makes significant contributions to economic development and social progress in various dimensions. However, the digital economy also brings about a further widening of the wealth gap and a series of issues such as layoffs and unemployment for some individuals.

Research on the digital economy still has limitations in certain areas. For example, further research is needed on the spatial spillover effects of the digital economy on cities. Furthermore, it is necessary to conduct a more in-depth study of the adverse effects of the digital economy on society and identify solutions. Additionally, research on the high-quality development of urban economies through the digital economy should be further enhanced.

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