

# *Research on the impact of the digital economy on industrial structure upgrading*

Hui Li<sup>1,a,\*</sup>

<sup>1</sup>*Department of Economics, Harbin University of Commerce, Huanghai Street, Laixi, Qingdao, Shandong, China*

<sup>a</sup>*a18653224381@163.com*

<sup>\*</sup>*Corresponding author*

**Keywords:** Digital Economy, Industrial Structure Upgrade, Impact Path

**Abstract:** The digital economy is a new economic form that is gradually becoming an important force in China's industrial restructuring. Based on an examination of the current state of China's digital economy and industrial structure, this paper makes the following recommendations to improve the digital economy's promotion effect on China's industrial structure: Accelerate the development of digital infrastructure, improve digital technology's independent innovation capability and improve the institutional environment for developing the digital economy.

## 1. Introduction

The digital economy is an innovative application of information technology and information resources based on the Internet, with the effective integration of data production and social resources at its core, driving revolutionary changes in economic activities such as production, distribution, circulation, and consumption<sup>[1]</sup>. The Central Political Bureau meeting in 2021 proposed to take advantage of the massive amount of data and rich application scenarios, promote the deep integration of digital technology and the real economy, accelerate the development of the digital economy, promote the digital transformation of industries, accelerate the development of the industrial Internet, and solidify the architecture of artificial intelligence, integrated circuits, the Internet of Things and other industries. The digital economy has become a critical factor in promoting high-quality development in a variety of industries in China<sup>[2]</sup>. It is necessary to investigate the impact of the digital economy on the industrial structure in this context.

## 2. The current situation of China's digital economy and industrial structure development

### 2.1. Examine the current state of the digital economy's development

The digital economy is a new economic form that promotes sustainable and healthy economic and social development through the deep integration of digital technology with the real economy, continuous innovation in production and operation methods, and widespread application in agriculture, industry, service industry, and other fields<sup>[3]</sup>.

With the support of government policies, digital technology has continued to develop in recent years, as has the demand and scale of information consumption, and the scale of the digital economy has grown rapidly, becoming an important engine for driving economic growth. China's digital economy exceeded 30 trillion yuan in 2019 and reached 31.3 trillion yuan in 2018, accounting for 39.8% of the country's GDP. By 2020, China's digital economy worth 39.2 trillion yuan, accounting for 39.8% of the country's GDP, up 9.7% from the previous year and growing at a 2.5 percentage point quicker rate, 3.7 percentage points faster than in 2017. In terms of infrastructure, by the end of 2019, China Mobile broadband access ports had increased to 876 million, China Telecom Internet access ports to 575 million, China Unicom Internet access ports to 625 million, and China Mobile broadband access ports to 723 million. From an industrial perspective, China's digital economy in 2020, in addition to the information transmission, computer services, and software sector, has achieved high growth in the other five major industries. The digital content business generated 1.61 trillion yuan in revenue, up 30.1% year over year. Industrialization's part in the digital economy rises from 74.3% in 2015 to 80% in 2020, making a significant contribution to the digital economy's healthy development. The share of digital industrialization in the digital economy declines from 25.7% in 2015 to 19.1% in 2020.

## 2.2. Analysis of the current situation of industrial structure development

Industrial structure upgrading refers to the process of industrialization, according to the status of each industrial sector of the national economy and its law of change, optimizing resource allocation through technological innovation and industrial structure adjustment, and other ways to continuously improve labor productivity, thereby promoting rationalization and advanced industrial structure<sup>[4]</sup>.

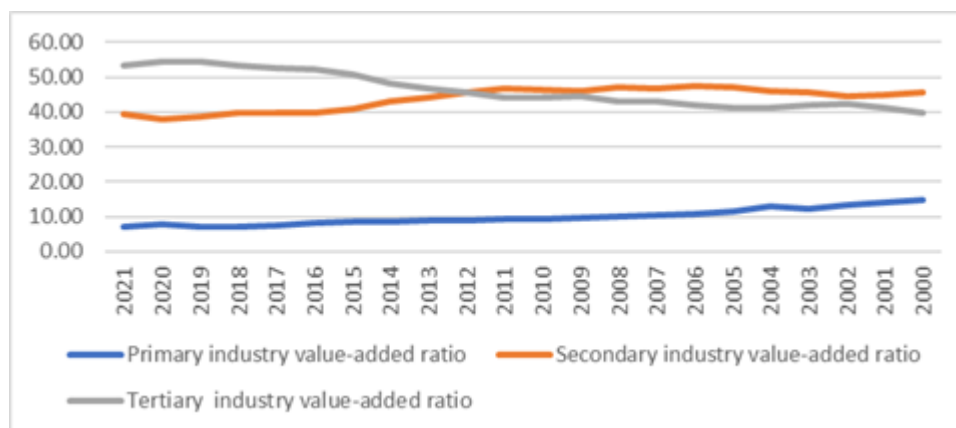


Figure 1: Trends in the structure of output value of China's three industries from 1978 to 2021.

From the three industry value-added changes, China's industrial structure has seen significant changes since the Economic Reform and Open Up. According to Figure 1, from 1978 to 1984, China was in the first stage of industrial structure, i.e., "one, two, three" type structure, with main agriculture, followed by industry, and the lowest service industry; from 1985 to 2012, China was in the second stage, i.e., "two, one, three" type structure, with main industry, followed by agriculture, and the lowest service industry. 2012 to date, China's industrial structure has developed the third stage, i.e., the "three two one" type structure, with the tertiary industry as the leading industrial structure. The primary sector contribute 7.26% of GDP in 2021, followed by the secondary sector with 39.43% and the tertiary sector with 53.31%. In contrast to developing nations and regions, developed nations and regions have tertiary industry proportions that range from roughly 60% to as high as 70%–80% in some nations and regions. The growth of the digital economy sector can

optimize and update the industrial structure to a certain extent, and there is more space for improvement in China's tertiary industry share.

Of the change in the employment structure of the three industries, according to Figure 2, the proportion of people working in the primary sector is falling. 20% of people employed in China's primary sector in 2000 fell to 22.87% in 2021, owing primarily to labor transfers between the agricultural and non-agricultural sectors, which is consistent with the pattern of economic development changes in most countries. The secondary sector employs a relatively stable number of people. The share of employment in the secondary sector increased by only 6.42% between 2000 and 2021. In 2014, the share of employment in the secondary sector surpassed that of the primary sector for the first time, and in 2011, the share of employment in the tertiary sector surpassed that of the primary sector for the first time, becoming the industry with the largest share of employment, which is also consistent with the development trend of the tertiary sector having the highest share of value added.

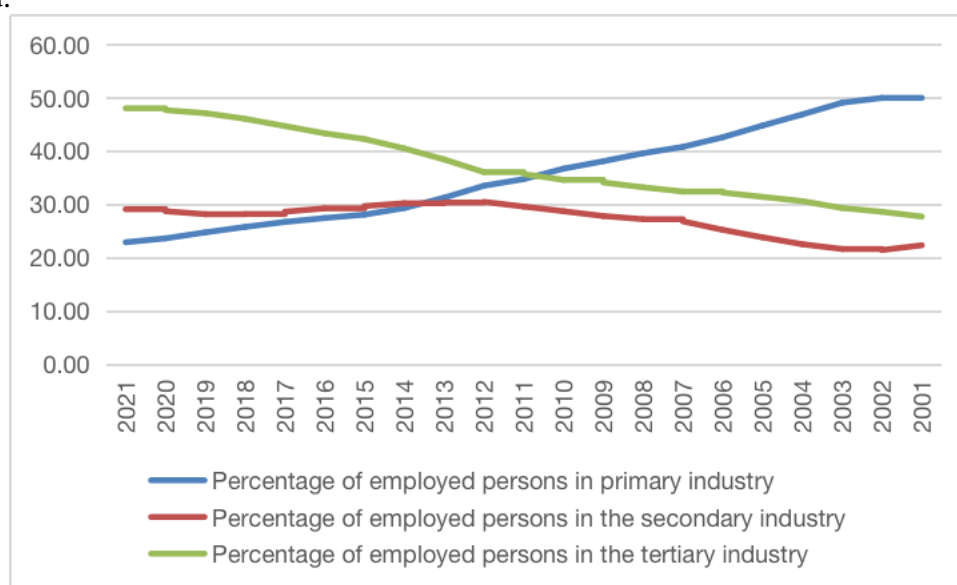


Figure 2: Trends in the output value structure of China's three industries from 2000 to 2021.

With the rapid development of the economy, China's industrial structure, whether from the ratio of the three industries or employment structure, has undergone significant changes, but when compared to the developed countries and regions of the tertiary industry output value ratio (up to about 60%, some countries and regions even up to 70%-80%) and the primary industry employment ratio (10%), as far as the current situation in China is concerned, the proportion of tertiary industry output value is low, while the proportion of the employed population in the primary industry is high.

### 3. The digital economy promotes the optimization and upgrading of the industrial structure of the realistic path

#### 3.1. Increase the pace at which digital infrastructure is built.

A key guarantee for the ongoing and healthy development of the digital economy, digital infrastructure is a requirement for the creation and deployment of all digital technologies. The long-term growth of the digital economy is hampered by several issues, including the inadequate construction of frontier infrastructure and the absence of digital integration applications in the construction of digital infrastructure in China. It is now essential to hasten the building of the nation's new digital infrastructure because of this. The top-level design of the new infrastructure

should be strengthened, as well as general coordination, particular plans for "digital infrastructure," a stronger connection and coordination between "sectors, industries, and cities," and regional planning. Assuring "regional development imbalance," minimizing the "digital divide" brought on by the "regional development gap" between areas, and encouraging the use of "digital technology" throughout the "nation" as a whole. Use of "digital technology" to advance "overall planning" and "resource sharing" between the "country" and the "region. Resource exchange. We will encourage the upgrading of network backbone nodes and broadband fiber, and hasten the development of state-of-the-art information infrastructure like 5 G networks, big data centers, and national data-sharing platforms. We should improve the way that digital technology is integrated into traditional industries and help them use it more widely. For instance, we should actively research new types of infrastructure like online education, Internet hospitals, artificial intelligence diagnosis, and treatment platforms, and use digitalization to support the innovation of development models in traditional industries<sup>[8]</sup>. We should also constantly encourage the upgrading of existing technologies.

### **3.2. Comprehensively enhance the independent innovation capability of digital technology**

A high-level talent team is required to increase industrial competitiveness and maximize the industrial structure. By examining the present situation, we can see that to advance the development of the digital economy, our talent team needs to be further strengthened and their capacity for innovation needs to be increased. Because of this, we must fundamentally strengthen the nation's capacity for digital technology independent innovation if we want to raise the degree of independent innovation based on digital technology across the board<sup>[7]</sup>. First and foremost, we need to create a multi-level and high-level technological innovation system from top to bottom, plan for future digital industrialization, advance study on the digital economy, and solve "stuck neck" and other problems. Establish a "government, industry, academic, study, and application" innovation community. Connect the industrial chain with the innovation chain. Second, to give businesses greater development space, enhance the ecology of digital technology innovation, offer better funding and policies for businesses, expand the available financing options, and create a multi-level ecological support system. Give financial support and policy preferences for the R&D efforts of businesses and research teams. To support the growth of the digital economy, it is necessary to cultivate a large number of complex talents who are knowledgeable about digital technology and are acquainted with market norms. Additionally, a training and incentive system for digital talent should be actively established. Universities, businesses, academia, and research institutes should also work together more closely. A high-level research team should also be established, the innovation potential of scientific and technological personnel should be fully explored, their enthusiasm for innovation should be stoked, and a talent pool should be built to support the digital industry's ability to innovate independently.

### **3.3. Continuously optimize the institutional environment for digital economy development**

A strong institutional setting can guarantee the digital economy's healthy growth, which will then help to improve and modernize the industrial structure. To lower the entry barrier for industries given China's national circumstances, we should first create a "negative list" of pertinent industries. We should also research and establish institutional norms to encourage the opening of public data and the effective flow of data resources in business registration, transportation, meteorology, etc., improve and refine the rules of data opening, promote the open sharing of data, and increase enterprise participation in the process<sup>[5]</sup>. The mechanism for ensuring fair competition must be improved, administrative approval processes must be made simpler, the rules governing the market for data elements must be established and improved, and administrative and technical hurdles must

be removed. To ensure fair competition in the market, we should intensify our investigations into all types of acts of crowding out and limiting competition that employs administrative power to obstruct the free movement of commodity factors and hinder businesses from functioning across regions. Second, we'll conduct a thorough analysis of the numerous issues preventing the growth of our digital economy. Based on the results of this analysis, we'll further improve our cybersecurity system and standardize and regulate our essential information infrastructure<sup>[6]</sup>. In this regard, we will intensify our research into information systems, enhance our complete network security management system, safeguard critical technologies and information, and foster an ecological environment that is supportive of data security and data property rights. Finally, we should strengthen laws and regulations in the digital economy, give high-risk areas like cross-border data flow, online consumer rights, and personal information protection enough attention, and promote legislation on cybersecurity, data management, intellectual property protection, and platform governance to foster an environment where the rule of law is favorable for the development of new technologies and new business models. To provide robust legal protection for the development of the digital economy, we must outline the responsibilities of each department, specify their areas of responsibility, and monitor how they are carried out.

## References

- [1] Zhang P. (2019) *The Nature of the Digital Economy and its Development Logic*. [J]. *Economist*, 02: 25-33.
- [2] Qi Y.D., Chu X. (2022) *An Empirical Study on the Mechanism of Digital Economy Development for Industrial Structure Upgrading*. [J]. *Learning and Exploration*, 04: 111-120.
- [3] Ren B.P., He H.C. (2022) *Digital Economy Empowering High Quality Development: Theoretical Logic, Path Choices and Policy Orientations*. [J]. *Finance and Economics Science*, 04: 61-75.
- [4] Gao J.P., S L.N. (2022) *Mechanisms and paths of digital economy development for industrial structure upgrading in China*. [J]. *Enterprise Economy*, 41(02): 17-25.
- [5] He D. (2022) *Analysis and Reflections on Natural Resources Data Openness in Hangzhou*. [J]. *Natural Resources Informatization*, 01: 65-70.
- [6] Chi M.Y., Shi Y.N.(2022) *A preliminary discussion on the connotation of digital economy*. [J]. *E-Government*. 04: 122-128.
- [7] Li Y.S.(2022) *An Analysis of the Political Economy of the Digital Economy*. [J]. *Economics of Finance and Trade*, 01:46-49.
- [8]Wei L.R.(2020).*Reflections on accelerating the construction of China's digital infrastructure construction system*. [J].*Information and Communication Technology and Policy*,09:63-66.
- [9] Wang J., Zhou L.Y. (2015) *A Study on the Collaborative Ecological and Environmental Management in Beijing, Tianjin and Hebei--Based on the Perspective of Institutional Mechanism*. [J]. *Economic and Management Research*, 36(07): 68-75
- [10] Li X.H. (2016) *The theoretical basis of "Internet+" to transform traditional industries* [J]. *Economic Review*, 03: 57-63.
- [11] Paul M., James W. (2001) *Digital Futures—An Agenda for a Sustainable Digital Economy*. [J]. *Corporate Environmental Strategy*, 8(3).