

# Research on the Mechanism of Digital Economy Promoting Industrial Structure Optimization in China

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## ABSTRACT

China is facing a critical period of development of digital economy currently, and trying to find the right way of employing the digital economy to realize the optimization and upgrading of industrial structure. Based on the analysis of the definition, current situation of digital economy and the obstacles of industrial structure optimization during the process of digital economy development, this paper puts forward the mechanism of digital economy promoting industrial structure optimization, including technological support, domestic demand-pulling and government management innovation.

**Keywords:** Digital Economy, Industrial Structure, Optimization.

## 1. INTRODUCTION

With the emergence of digital economy, the optimization and upgrading of industrial structure is the key point to achieve high-quality economic development. Digital economy requires the existing industrial structure and policy system to become more comprehensive, which is an opportunity to upgrade the industrial structure, but also a major challenge. The research on the upgrading of China's industrial structure under the background of digital economy is of great significance for realizing the optimization and upgrading of China's industrial structure and improving the development level of the industrial chain in the following years.

## 2. DEFINITION AND CURRENT SITUATION OF DIGITAL ECONOMY

### 2.1. Definition of Digital Economy

The term digital economy firstly occurred on The San Diego Union-Tribune in 1994, -- this new technology (cryptography) also provides digital signatures to authenticate transactions and messages, and allows for digital money, with all the implications that has for an electronic digital economy [1]. Over the next 20 years, many researchers defined the digital economy from their respective perspectives. There are some consensuses among them, including the close relationship between information technology and digital economy [2]. And some researchers pointed out the components of digital

economy, such as supporting infrastructure, electronic business processes (how business is conducted), and electronic commerce transactions (buying and selling), which helped the measurement of digital economy. Information economy, Internet economy and knowledge economy are often used as the alternatives to the digital economy [3]. In a nutshell, digital economy is an economic system in which production is performed by making using of digital technology.

### 2.2. Current Situation of Digital Economy

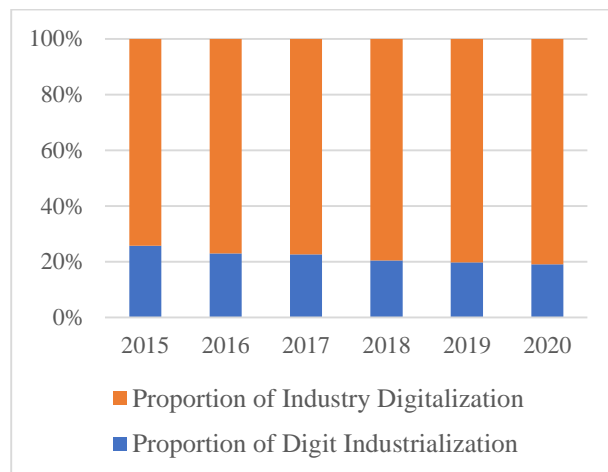
In China the proportion of digital economy in GDP is increasing quickly in recent years. Compared with the proportion of 14.2% in 2005, it changed to 38.6% in 2020. The growth rate of digital economy reached 9.7%, which is much more than the GDP growth rate in the same year. As can be seen from Table 1, the integration direction of digital economy with the three industries is similar to the industrial optimization and upgrading trend. Digital economy has stimulated the application of new digital technology in three industries, promoted the transformation of scientific and technological achievements into productive forces, accelerated the development of advanced manufacturing industry, and made modern agriculture more efficient. And the integration degree of digital economy and tertiary industry is obviously higher than that of primary industry and secondary industry, especially in 2020. Due to the COVID-19 pandemic, new digital industrial models such as online office, e-education and network video have

emerged and developed rapidly. A large number of enterprises are using big data and the technology of industrial Internet to strengthen the precise alignment of supply and demand, efficient production and coordination [4]. The integrated development of digital economy and industries is evolving to a deeper level, which is meaningful to the optimization and upgrading of industrial structure.

**Table 1.** Integration Rate of Digital Economy with Three Industries

Year	Primary Industry	Secondary Industry	Tertiary Industry
2016	6.2%	16.8%	29.6%
2017	6.5%	17.2%	32.6%
2018	7.3%	18.3%	35.9%
2019	8.2%	19.5%	37.8%
2020	8.9%	21.0%	40.7%

The industry digitalization is playing a critical role in the internal structure of digital economy from 2015 to 2020 (Figure 1). The scale of industry digitalization was 31.7 trillion RMB in 2020, which accounts for 31.2% of GDP and 80.9% of digital economy, and the latter proportion in 2015 was only 74.3% [5].



**Figure 1.** Digit Industrialization and Industry Digitalization in China

The digitalization scale of the industry was higher than that of digital industrialization, and the level of industrial digitalization kept improving. The digital economy can drive high-tech industries and strategic emerging industries, speed up the digitalization process of industries and upgrade the industrial structure. It has become a new driving force of growth of economy and optimization of industrial structure.

### 3. OBSTACLES OF INDUSTRIAL STRUCTURE OPTIMIZATION

It is important for China to take the advantage of digital economy to improve basic industrial capacity and modernize the industrial chain [6]. The analysis of the obstacles of China's industrial structure optimization by the digital economy can help understand the existing problems and find out the effective path to adjust the upgrading structure.

Lack of innovation weakens the basic industrial capacity. Innovation is one of major driving forces leading the development of digital economy and also an important force leading the upgrading of industrial structure now. Affected by the covid-19 epidemic, weakness in independent innovation capacity and scientific and technological system has been enlarged. In many core fields, there are still technological obstacles, which mean that technical equipment and key core components are dependent on the suppliers of other countries and the lack of innovation in industrial infrastructure has limited the improvement of basic industrial capacity.

The digital economy develops at a fast speed and promotes the development of new technologies, new forms of business and new models, but the integration degree of the digital economy and the real economy is still at a low level. On the one hand, it restricts the development of emerging industries, while traditional industries cannot achieve transformation and upgrading, hindering the optimization and upgrading of industrial structure. On the other hand, it delays the digitization process of real economy and is not conducive to the effective resources allocation.

At present, the institutional guarantee does not match the development of digital economy. The optimization of industrial structure needs a certain institutional system as support, and the formulation of government policies can direct the adjustment of industries by effective system and ineffectual industrial policy, including promoting the flow of resources to emerging industries and high-tech industries, and guiding the rational and effective allocation of resources. Insufficient guarantee of institutional system will discourage the vitality of enterprises to participate in market competition, restrict researchers' enthusiasm for scientific and technological innovation, slowdown the process of technological innovation, enterprise transformation and upgrading of traditional industries.

### 4. MECHANISM OF DIGITAL ECONOMY PROMOTING INDUSTRIAL STRUCTURE OPTIMIZATION

The digital economy is the application of digital technology in the field of economy, which is driven by the information technology, to realize digital

transformation of traditional industries, promote the development of emerging industries, and actuate the transformation and upgrading of industrial structure. The upgrading of industrial structure is driven by certain technological evolution. From a micro perspective, it is to promote the transformation and upgrading of enterprises, improve their production efficiency and promote the upgrading of industrial chain through scientific and technological innovation and technological changes. From a macro perspective, the upgrading of industrial structure is the flow of resources among different sectors to make the transformation of economic growth mode to knowledge-intensive direction, and to achieve high-quality development of the economy driven by innovation [7]. The digital economy gives rise to the continuous development of new technologies, new models and new forms of business, which is both an opportunity and a challenge to the upgrading of China's industrial structure. The new models and new resources will enhance the international competitive advantage of the industry, create a development platform for emerging industries and push the development of the industry to the medium-high level.

#### ***4.1. Providing Technological Support for Industrial Structure Optimization***

With the continuous emergence of new technologies, new business forms and new models, the digital economy is the product of a new round of scientific and technological revolution, which drives scientific and technological innovation and technological evolution. The development of digital economy pushes the continuous emergence of new technologies, which drives the optimization of industrial structure and the transformation of economic development mode. The updated artificial intelligence, the Internet of things and other technologies are pushing many industries toward the direction of intelligence and digitalization.

The development of digital economy provides the support of new technologies, new applications and new development modes for the upgrading of industrial structure, which changes the internal and external industrial structures [8]. On the one hand, the digital economy provides a new platform for the industrial structure upgrading. It can accelerate the process of the construction of network infrastructure, make the contact among different sectors and between the two markets at home and abroad closer, deepen the development of sharing economy, speed up the transformation of scientific and technological achievements to productivity. On the other hand, the digital economy brings many new technologies to the industrial structure upgrading. It gives rise to the development of emerging industries. The evolution of information technology has given birth to the development of digital economy, and then it promoted the emergence of new industries and high-tech industries,

and brought new opportunities for the upgrading of industrial structure. The new economy makes the advanced manufacturing sectors more intelligent and information-based, improves the quality of the supply system, and realizes the rational allocation of resources. Led by a new round of technological revolution and industrial transformation, the development of Internet, big data, artificial intelligence and other technologies has driven the development of digital economy and supported the industrial structure to upgrade.

#### ***4.2. Providing Policy Support for Industrial Structure Optimization***

Compared with traditional labor-intensive industries, knowledge-intensive and technology-intensive sectors play more important roles in the development of digital economy. It requires that enterprises should strengthen the technical transformation and technological innovation, and the government should adjust the policy mechanism to adapt to the new situation of economic and social development and implement industrial policy guidance at different stages of development.

Firstly, China attaches great importance to industrial development, stressing the need to combine the decisive role of the market in resource allocation with the role of the government, push the optimization and adjustment of the industrial structure, develop advanced manufacturing, and move China's industries to the medium-high level.

Secondly, the digital economy system will promote the government to improve industrial policies and measures, optimize the system and mechanism of policy implementation, and create an enabling policy environment to overcome the barriers of the industrial structure optimization.

Thirdly, the government in China is to promote the formulation of industrial policies to conform to the development of digital economy, promote the industrial policies to be inclined to emerging industries and high-tech industries, improve the timeliness of industrial policies to serve the industrial development. These industrial policies play a critical role in industrial development and optimization of industrial structure.

Finally, the development of digital economy has accelerated the process of industrial development, made some adjustments of industrial policies, and improved the system and mechanism of policy implementation. Policy support can drive the transformation and upgrading of enterprises, form the cluster development of emerging industries and provide industrial foundation support for the upgrading of industrial structure.

### 4.3. Providing Domestic Demand Support for Industrial Structure Optimization

With a large population, China has a huge consumer market and great potential for domestic demand. The digital economy has produced many new consumption hotspots and consumption patterns, and promoted the transformation and upgrading of consumption. The upgrading of industrial structure needs the promotion and guidance of domestic demand, and the expansion of domestic demand benefits from the support of digital economy, which has become a key force to drive economic growth and industrial structure upgrading. It influences the consumption pattern, lifts the consumption level, consolidates the basic position of consumption in driving economic growth, guides the development of emerging industries, and pushes the optimization and upgrading of industrial structure.

Firstly, we should transform and upgrade the patterns of consumption. The digital economy has accelerated the construction process of network infrastructure, which makes it certain to develop Internet, information consumption, and even online electronic commerce. At the same time, it provides many new consumption platforms to facilitate customized consumption, knowledge consumption, health consumption and other new consumption hotspots, and drive the related sectors to make coordinated progress.

Secondly, we should expand effective investment. Digital economy is a new economic form resulting from a new round of scientific and technological revolution and industrial transformation. It needs the support of new infrastructure construction. China is strengthening the construction of new infrastructure and accelerating the development of digital economy, so the digital economy will expand the effective investment in the construction of new infrastructure and guide the flow of resources to emerging industries and high-tech industries.

Thirdly, the investment environment has been optimized with the development of digital economy. Digital economy asks for the application of new technologies, gradually improves the quality of domestic supply system, optimizes the investment environment, drives the continuous expansion of domestic demand, directs the rational allocation of resources, and pushes the transformation and upgrading of traditional industries. In general, these new demands create domestic demand support for the upgrading of industrial structure.

## 5. CONCLUSIONS

Based on the analysis of the current situation of China's digital economy, this paper studies the relationship between the development of digital economy and the optimization of industrial structure. We can draw the conclusions as following. Firstly, there are some obstacles that the optimization of industrial structure

faces, such as lack of innovation and institutional support and insufficient integration of digital economy and upgrading. Secondly, the related industries in China can be upgraded through the application of digital technology. It can redefine some traditional sectors so that the original industrial development pattern will be changed. Thirdly, policy makers will use the development achievements of digital economy to formulate regulation policies and guide the industry structure. Finally, digital economy can also stimulate new domestic demand and drive the optimization of structure from the demand side.

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