

# Analysis of Industrial Upgrading Problems in Western Region in the Context of Digital Economy

Jiajia He<sup>1,†</sup>, Yafan Yang<sup>2,†</sup>, Xinyu Ye<sup>3,\*,†</sup>

<sup>1</sup>Xi'an Jiaotong-liverpool University, Suzhou, China

<sup>2</sup>Arcadia High School, California, US

<sup>3</sup>Zhuhai College of Science and Technology, Zhuhai, China

\*Corresponding author: Grace0211@stu.zcst.edu.cn

†These authors contributed equally.

**Abstract.** China's economic growth has transitioned into a new normal of sluggish growth and decreasing growth and industrial upgrading, as a critical part of adjusting China's industrial structure, has a major impact on fostering high-quality economic growth. In this paper, a practical analysis of the impact of the digital economy on modernizing industrial structures impact of the digital economy on modernizing industrial structures in western China is presented, using the case of Chongqing to study the situation of industrial upgrading in the western region and to identify the issues and the operation of the digital economy. on it. It is found that the western region, as a newly developing region for China's digital economy, focuses on the characteristics and advantages in terms of location, resources and industries, and The digital economy stimulates industrial upgrading of the western region and its economic development.

**Keywords:** Digital Economy ,Western Region ,Industrial Upgrading.

## 1. Introduction

### 1.1 Research Background

On August 3, 2012, the Global Digital Economy White Paper was published, showing that China's digital economy ranked second in the world last year with a total volume of nearly \$5.4 trillion, and that China's digital economy grew at a year-on-year rate of 9.6 percent, ranking first in the world

The western area offers advantages in terms of power and labor costs and has a lot of potential to establish a digital economy, but this growth has halted. While the average value of the digital economy development index from 2013 to 2021 is 1565.28, the indicator of the growth of the digital economy climbed from 755.04 in 2013 to 2855.36 in 2021, a rise of 2.7.8 times in eight years. The digital economy development is strong [1].

The emergence of a new development pattern and the expansion of China's economy are both facilitated by the digital economy. According to recent survey findings, China's eastern region has a digital economy that is relatively well-developed, whereas the center and western regions' sectors are undeveloped and currently have a low penetration rate. Statistics demonstrate that the digital economies of the center and western areas have grown more rapidly than those of the eastern regions, demonstrating the digital economy's considerable potential.

### 1.2 Literature Review

The current state of research on the subject of the digital economy and industrial modernization mostly focuses on the consequences of the digital economy. on modernization of industry.

First, regarding the issue of the relationship between the two, Jian Han and Jiangyu Li (2022) empirical a dual-dimensional method was used in study on the impact of the growing digital economy on industrial structure transformation and upgrading at the prefecture-level city level [2]. Secondly, to address the expansion of the western region's digital economy, Pingping Cao et al. (2022) explored the relative regional differences in digital economy development and its causes in the western region through the Dagum Gini coefficient method, and found a low degree of inter-regional imbalance in

the western region. The primary factor is that the center and western areas' overall degree of development is lower than their economic development level and information infrastructure construction, and the gap is relatively small and balanced [3].

In conclusion, existing studies have used various methods that are enlightening and informative for understanding the relationship between the digital economy and industrial modernisation. Existing research, however, focuses primarily on the fact that the western region's digital economy and the unique role they play in the industrial upgrading of the region's economy has just started and there is less relevant data, so there is still much room for research. For this reason, this paper will explore in depth the issues related to the role of the digital economy in Western region industrial upgrading, and improve from specific cases.

### **1.3 Research content and significance**

Firstly, this paper analyzes the relevant literature of domestic and foreign scholars, Explain the present situation of the western region's digital economy and how it relates to industrial modernization. Secondly, the western area and the extent of industrial upgrading are made clear, etc. Based on this, this paper examines how industrial upgrading affects the western region's digital economy, examining the interactions between traditional industries and the digital economy. This paper finds that the digital economy penetrates and integrates with traditional industries, and traditional industries are accelerated by the digital economy. In addition, this paper also looks at the issues, opportunities and effectiveness of industrial upgrading in the western region, and analyzes how policies can be optimized western region industrial upgrade more competitive.

In conclusion, the transformation of industrial structure is a crucial means of fostering societal and economic growth. a crucial strategy for fostering high-quality economic and social progress in the western area. The expansion of the digital economy not only provides a reassuring source of kinetic energy for the western region's high-quality economic development, but it also maximizes the proportion of traditional production factors allocated and integrates digital technology into traditional industries, promoting the western region's industrial upgrading. The western region's digital economy has grown rapidly, therefore it is advantageous for industrial upgrading and studying its inherent influence mechanism to look into the reasons that have contributed to this expansion. The objective of this paper is to evaluate the situation of the western region's industrial upgrading and digital economy at the moment, investigate the variables affecting how the internet economy affects that upgrading, and make practical and scientific recommendations.

## **2. Necessity and characteristics of industrial upgrading in the western region**

### **2.1 Related concepts**

#### **2.1.1 Industrial upgrading**

The term "industrial upgrading" primarily refers to the enhancement of industrial quality and efficiency as well as industrial structure. Technological advancement is necessary for industrial upgrading. The improvement of industrial quality and efficiency is demonstrated by the coordinated advancement of industry and upgrading of structure, as well as by the improvement of product quality. The improvement of industrial structure is also demonstrated by the coordinated advancement of industry and upgrading of structure [4].

#### **2.1.2 Western Region**

The western region of China is a geographical and economic subregion of China that includes Chongqing, Sichuan, Shaanxi, Yunnan, Guizhou, Guangxi Zhuang Autonomous Region, Gansu, Qinghai, Ningxia Hui Autonomous Region, Tibet Autonomous Region, Xinjiang Uygur Autonomous Region, and twelve provinces, autonomous regions, and municipalities directly under the Central Government. Land area made up 6,781,589,000 square kilometers by the end of 2018, or 70.6% of the nation's overall area. The western region encompasses a huge area. The vast bulk of the region is

an economically underdeveloped region of China that requires more development, second only to the Sichuan Basin and the Guanzhong Plain.

## **2.2 The necessity of industrial upgrading in the western region**

### **2.2.1 Promote regional economic development**

In general, in recent years, the growth rate of the central and western regions began to decline, the transformation and upgrading is relatively slow, the new economy, new dynamic energy, new business growth patterns and capabilities significantly lag behind the Ministry. But the western region also contains a lot of growth potential, the need for government policy guidance, enterprise innovation and development, according to the market-oriented, to promote high-quality growth in the western region, which is not only the western region itself, but also about the development of China's industrial structure upgrade.

The important role of promoting local economic and social development, which can gradually catch up with the fast-growing eastern regions and thus narrow the gap between regional economic development, is served by the industrial upgrading of the central and western regions. This can balance the development speed and scale of their economies with those of the developed eastern regions [5]. And because the central and western regions have their own resource advantages, including the entire central and western regions having more abundant resources, output factor costs are also relatively low; therefore, in order to strengthen economic development, infrastructure construction, land resource development, and the advancement of science and education should be prioritized in order to only take advantage of the advantageous industries in the western region, so as to best encourage the western region's economic growth. Additionally, industrial upgrading increases the output efficiency and production efficiency of businesses, both of which can further support economic development and create a stable cycle.

### **2.2.2 Adjustment of national industrial structure**

Industrial digitalization refers to the activity of upgrading, transforming and reengineering all elements of the upstream and downstream sections of the enterprise value chain with data as the basic element, enterprise economic value generation as the basis and enterprise data empowerment as the main line under the support and promotion of new data. To a certain extent, industrial digitalization can help the traditional manufacturing industry to realize re-transformation and enhance its competitiveness in terms of quality and efficiency, which also means that it can form a new pattern of manufacturing division of labor and cooperation, breed a new industrial system, and increase the engine of exchange between the old and new dynamics. Thus, the national industrial structure will be indirectly adjusted.

At the same time, the establishment and adjustment of a rational industrial structure can make full use of resources,

## **2.3 Characteristics of industrial upgrading in western region**

### **2.3.1 Unique regional advantage**

Due to historical and geographic factors, the western area's economic development has lagged behind that of the eastern region; its GNP is low, and its GDP per capita is below the average level of the eastern region, but the western region has its own unique regional advantage, which is rich in resources, relying on this advantage, coupled with the national promotion of industrial restructuring and development of special advantageous industries in the western region, the relevant industry has formed a certain scale. Promoting the development of encouraging industries in the western region can, on the one hand, promote the optimization and upgrading of industries in the western region, and, on the other hand, promote the sustainable and healthy economic development of the western region.

### **2.3.2 Technological innovation has become the core engine of industrial upgrading**

The vigorous development of the modern new technological revolution and the normalization of the digital economy have triggered the development of changes in various industries and fields and have become the leading force in leading economic and social development. For the high-tech industries in the western region supported by modern digital information technology, etc., the importance of information technology is particularly evident in the industrial transformation and upgrading. Driven by a series of new technologies such as artificial intelligence, cloud computing, big data, blockchain, Internet of Things, social networks, 5G, virtual reality, etc., new technology development and application is becoming an important cornerstone for industrial upgrading and development in the western region.

## **3. Overview of Industrial Upgrading in the Western Region**

### **3.1 Problems facing industrial upgrading in the western region**

Since the national Western development strategy's introduction, the western region of China has experienced rapid economic development, complete infrastructure, and the traditional situation of lagging in poverty alleviation has also been improved. Due to the low starting point and weak economic foundation of the western region, The social and economic advancement of the western and eastern regions still differ significantly, so the industrial upgrading of the western region needs to rely on a reasonable industrial structure.

The first difficulty encountered by the transformation of enterprises in the central and western regions is the transformation of their own industrial structure, and there are three main causes: first, the awareness of frequent product innovation is not high, Because there are few high-tech products in the central and western areas, the comprehensive competitiveness of high value-added in the market has long been at a disadvantage, but at the same time, the output benefit is small, the product brand is small, the business model is simple, so the enterprises in the central and western regions in the Therefore, enterprises in the central and western regions do not receive many policy dividends in the process of transformation of local advantageous industries, so it is difficult to upgrade the industrial structure [6]. On the one hand, there are gaps in the development infrastructure of different regions in the central and western regions, and there are also gaps in the strength of cultivating advanced industries; on the other hand, the huge differences in the conditions of the western provinces themselves make the industrial division of labor and collaboration inefficient, and the driving effect of the overall development of the region is not obvious. Finally, there is still a gap between the level of industrial development in the western region and the eastern region, and it is more difficult to undertake the high-end industries in the east. On the one hand, the western region's economy starts late, the foundation is weak, the development speed is slow, so the western region accepts the cooperation with the eastern region when the hardware facilities conditions cannot meet the high-end industries in the eastern region; on the other hand, the western region's social development is slow, the market allocation is low, the economic resources are few, the preferential treatment and compassionate dividend is not high, as a result, it is difficult to recruit eastern or abroad talents to the western region in order to develop and promote the western region's industrial upgrading.

The second difficulty encountered in the economic transformation of the western region is that the preferential fiscal policies are not in place, the root cause of which are two things: one is the fiscal policy. First, the central budget financial investment cannot fully guide the social capital. Every year, the central government allocates limited funds to the central and western regions, making it difficult to promote infrastructure construction in the western region. Second, regional debt pressure is increasing, as the scale of industrial upgrading in the central and western regions of China is getting larger and larger, the cost of government debt issuance and debt repayment is getting higher and higher. The link between government fiscal policy and market financing policy is not close enough, and the government cannot fully mobilize the initiative of various basic factors in the financial market

to actively participate in international trade. The second is in the policy area. First, the government tax incentives for technological innovators is not high enough, the innovation incentives are not perfect, and the incentives for high-end industrial talents are not enough, so it is difficult to attract cutting-edge talents and excellent enterprises to develop in the western region. Secondly, the requirements to enjoy income tax preferences are high. The preferential income tax exemption policy for enterprise technology innovation stipulates that only companies with profitability can enjoy such preferential policies, which is a huge pressure for immature and growing enterprises. Therefore, the current innovation policy is not conducive to promoting the development of innovation and industrial structure in related fields.

### **3.2 Opportunities for Industrial Upgrading in the Western Region**

#### **3.2.1 Foreign trade promotes the upgrading of industrial structure in the western region**

In the past two decades, the import and export trade in the western region has been steadily increasing, and the sufficient foreign trade in the western region has been developed rapidly. After the policy of "Silk Road Economic Belt", The western region's tertiary industry has expanded, taking the lead in economic development and turning into the region's main driver of growth. According to Chen Qingke, foreign trade affects the upgrading of industrial structure through the following four points: firstly, capital accumulation affects the upgrading of industrial structure, and capital accumulation is realized in the western region through import and export and foreign trade investment, which promotes the upgrading of industrial structure in the western region [7]. Secondly, consumer demand affects industrial structure upgrading. Excess capacity and excess products will reduce economic development and industrial structure upgrading, but foreign trade can not only solve the problem of excess capacity through exports but also alleviate the shortage of domestic production factors through imports, thus promoting industrial structure upgrading. Next, technological innovation affects industrial structure upgrading. Industrial structure upgrading is inseparable from technological innovation, and technological innovation is inseparable from the international market, so it is necessary to introduce technology from other countries to promote national technological progress. The more foreign trade leads to higher human capital income and the transfer of labor from other sectors to higher-income firms, thus promoting the increase of labor in the west and the upgrading of industrial structure. Finally, the reform of the system affects the upgrading of industrial structure, because the economic system has an impact on production relations, economic development and industrial structure, and foreign trade can also affect the reform of the national system through some effects, As increased foreign trade encourages international interaction and to some extent influences the economic system, For instance, the Free Trade Pilot Zone in China's western area pushes the change of economic system and encourages the optimization and upgrading of industrial structure, which can help the western region's economy flourish.

#### **3.2.2 The western region to undertake the eastern industrial transfer to promote industrial structure upgrading**

It is inevitable for western regions to undertake eastern industries to compound the law of industrial development, and Li Jin said that the existence of development gradient difference in industries is the condition for smooth industrial transfer. Because there is a gap between the industries in each region, so that the transfer of industries from high-gradient areas to low-gradient areas is an inevitable result. Eastern region industry transfer west on the one hand is the demand for industrial development, on the other hand to promote the economic development of the western region, regional coordinated development contribution. For the western region, by undertaking the transfer of industries from the east can effectively promote scientific and technological innovation, learn new skills to accelerate the industrialization process and promote the economic development of the western region. Chongqing along the river to undertake industrial transfer demonstration area in 2021 to undertake the eastern region industrial transfer project 347, the demonstration area gross domestic product than the city three percentage points, driving the economic development of Chongqing makes Chongqing's

economic growth rate is located in the first in the country. Wuzhou as a demonstration zone to undertake industrial transfer, the development of industrial transfer projects to undertake the success of the development of Wuzhou to undertake the transfer of industries in the east are the following four: First, renewable resources processing industry cluster, through the recycling of old wires and cables, waste mechanical and electrical, scrap steel and other products reprocessed to produce recycled copper, aluminum, stainless steel and other products. It is an important industrial base in the Pan-Pearl River Delta region. Second, the ceramics industry cluster, taking advantage of Wuzhou's land resources and cheap labor to develop products with ceramics as the main raw material, and in 2015 became the "new pottery capital" in the South. Third, photoelectric information industry, by taking over the transfer of photoelectric information enterprises in Dongguan and Shenzhen, the development of electronic information products in Wuzhou, to become a demonstration base to undertake the transfer of electronic industries in the east. Fourth, the light industry and textile industry, through the full use of local land resources, raw materials, labor, while the transfer of industry and technology integration, promote the upgrading of light industry and textile industry and enterprise development.

### **3.3 Optimization policies for industrial upgrading in the western region**

With the consent of the State Council of China, the Development and Reform Commission of China has formulated and published the "Product Catalog of the Western Economic Zone Incentive Category (2020)", which re-calculates the personal income tax of SMEs at a 15% tax rate for the encouraging SMEs in the central and western regions, and has been implemented since March 1, 2021 [8]. According to the survey data of each province, about 250,000 (times) private enterprises have received the preferential policy of enterprise income tax for western development in 2011-2018, which has reduced the personal income tax of SMEs by about RMB 502.5 billion, At the same time, it has also driven the optimization and upgrading of the leading industries in the central and western regions, effectively promoting the sustainable and healthy economic and social development of the central and western regions. In recent years, the economic growth rate of the western region has remained the first in the province, and the proportion of the total economic volume and income in the status of the province has steadily increased. In order to ensure the effective functioning of the national incentives, the government needs to formulate corresponding management rules in the later stage of corporate governance and provide guidance by relevant government units to clearly determine whether the company's main business is a key national incentive enterprise project; for those that do not meet the requirements of the national tax incentives, the local tax authorities will make appropriate Disposal. In the next step, the relevant government departments will help further study and refine the relevant operation methods to ensure that the enterprise income tax policy for western development is put into practice.

## **4. Advantageous industries for industrial upgrading in the west**

### **4.1 Southwest**

Sichuan has obvious regional advantages and can be said to be the leading position in the whole western region. Over the years, Sichuan has been gradually upgrading its industrial development environment through globalization and regional economic cooperation [9]. With the promotion of various factors, the power battery industry in the southwest of Sichuan Province has been developing rapidly. At the same time, the government issued relevant policies, making the Sichuan power battery industry investment is very large, but also predictable is the formation of a considerable industrial scale. In order to further promote the development of Sichuan with high quality, Sichuan attaches great importance to the development of strategic emerging industries for the adjustment and optimization of industrial structure, and promote the important role of economic development transformation and upgrading. In Sichuan there are 8 high-tech parks and more than 4,000 high-tech enterprises, which have become the backbone of its advantageous industrial development. This also

shows the great potential of industrial development in Southwest China, which is expected to achieve new success.

## **4.2 Northwest**

### **4.2.1 New Infrastructure**

Digital economy in the process of high-speed development of the Internet, providing enterprises with a large amount of data and economic information, and promote the improvement of enterprise production efficiency, so in the optimization and upgrading of industry in the Northwest, information technology infrastructure facilities are well equipped is a prerequisite. The "new infrastructure" is an infrastructure system that provides digital transformation, integrated innovation, intelligent upgrading and other services, including communication network infrastructure; integrated infrastructure; and innovative technology facilities. In order to seize the opportunity to expand national investment in infrastructure facilities, Shaanxi Province is striding into the 5G era, vigorously promote the Internet of Things, industrial Internet construction, accelerate the research and development of core technologies in the field of information, vigorously develop the digital economy, promote intelligent manufacturing and industrial digital transformation action, and promote industrial quality and efficiency upgrade.

### **4.2.2 Major equipment manufacturing industry**

Equipment manufacturing industry is the foundation of the country, is an important industry and advantageous industry in the western region, has a pivotal position in the country, so the development of major equipment manufacturing industry is an important task in the western region. Western region is rich in resources, national defense science and technology industry enterprises in the geographically advantageous equipment manufacturing industry, large storage capacity, technical equipment, has the advantage of development and manufacturing. Such as Shaanxi Auto's pure electric heavy truck, sales growth is obvious, its advanced technology level and support to reach the domestic first-class level, is the epitome of Shaanxi Province to promote the development of manufacturing. In addition to Shaanxi Auto, Shaanxi Province has given full play to its advantages in industrial fields such as aerospace, CNC machine tools, petroleum metallurgy and coal heavy equipment, producing a number of domestic and even international first-class products. In recent years, the state has attached great importance to stimulating the innovative vitality of manufacturing enterprises, and has introduced and improved relevant policies to provide an important guarantee for the upgrading and development of the equipment manufacturing industry.

## **5. Case Study of Industrial Upgrading in Western Region - Chongqing as an Example**

### **5.1 Problems of Industrial Upgrading in Chongqing**

#### **5.1.1 Limited ability of enterprises to develop science and technology**

The status quo of light innovation, light technology and light development of SMEs in Chongqing is also quite common [10]. At the same time, it is also reflected in the lack of innovation spirit of many enterprise managers, managers as the head of an enterprise, its direction is not clear, for a whole, it is difficult to continue to develop. Moreover, enterprises will invest very little in human and financial resources for research, and only pay attention to the initial research and design stage, but do not develop core technologies, which means that it is difficult to optimize and upgrade the industry. In this era of booming digital economy, if enterprises do not strengthen their own research and innovation capabilities, they will sooner or later be left behind.

#### **5.1.2 There are shortcomings in the industry chain supply chain**

Industrial chain supply chain level is not high, competitiveness is not high, insufficient support and other problems still exist, the lack of key links in the industry chain in some industries, the high

degree of foreign dependence of core components, high-end chips, high-end sensors and other core components are still dependent on imports, the supply chain security and stability of the industry chain there are hidden worries [11].

Chongqing for the problem, the development of two major projects, both to promote the modernization of Chongqing's industrial chain, to make up for the shortcomings of the core basic components and other electronic information industry. Nevertheless, Chongqing needs to make up for the short board of the industrial chain there are still many, some products as a whole are still in the middle and low end, the added value is not high, not many well-known brands, the supply side and demand side match still need to be strengthened.

### **5.1.3 General industrial development environment**

Enterprise financing is still difficult, so financing is still the main problem facing micro and small enterprises, and capital is the key to promote industrial development, which has also become an important bottleneck limiting the development of micro and small enterprises. In particular, many "technology-based" and "intelligent" micro and small enterprises are characterized by light assets, high investment and high risk, and have a large capital gap at the early stage of development, which makes it difficult for them to obtain bank financing due to the lack of collateral. Micro and small enterprises have become an important part of China's national economy and play a positive role in stabilizing employment, protecting people's livelihood and promoting development. This also means that it is urgent to improve the industrial development environment of small and micro enterprises. In addition to financial efforts, the government should also help enterprises in terms of technology policies.

## **5.2 The promotion of the development of digital economy for industrial upgrading in Chongqing**

### **5.2.1 Break free from restrictions on industrial transformation and improvement**

The prerequisite for the completion of industrial transformation lies in the completion of the information technology infrastructure, that is, the need for new infrastructure. The growth of the digital economy is to blame for this, the establishment of data and communication Internet and other information technology infrastructure has greatly improved the ability of enterprises to collect, preserve and analyze economic information, further promoting the improvement of enterprise production efficiency; digital computing can also promote the deep integration of industry and network, using the advantages of the network's big data processing and cloud computing resources to develop excellent synergy effects, is to promote the traditional industry highly, the Intelligent key factors.

### **5.2.2 Promoting enterprise innovation and development**

The digital economy can also promote small and medium-sized enterprises to carry out open new business development through its innate advantages and characteristics such as information dissemination across time and space, economy of scale and regional operation, which can, on the one hand, expand the depth of enterprise technological innovation and release the huge dividends of the digital economy in the regional innovation system, and on the other hand, overturn the traditional inertia of enterprises and promote the generation of innovative ideas, thus accelerating the accumulation of human capital. On the other hand, it can overturn the traditional inertia of enterprises and promote the generation of innovative ideas, thus accelerating the accumulation of human capital, promoting financial development, increasing the innovation achievements of enterprises, empowering their independent innovation capacity, ultimately leading to the creation of new employment patterns, the change, and modernization of the industrial structure.

### **5.3 Measures to promote industrial upgrading in Chongqing**

#### **5.3.1 Use its own advantages to attract and undertake industrial transfer from the eastern region**

Since the reform and opening up, the economy has grown rapidly and the eastern region is sensitive to changes in factor costs. Compared with the eastern region, Chongqing has the advantages of low labor cost and abundant natural resources, so Chongqing should take the initiative to attract the industrial transfer from the eastern region and use cheap and sufficient low-end factors to gain competitiveness to join the industrial chain, and undertake the eastern industries can promote the industrial upgrading in Chongqing: firstly, the industrial transfer brings a large amount of capital accumulation and technology transfer to enterprises to create conditions for industrial upgrading; secondly, the industrial transfer is beneficial to Secondly, the industrial transfer is beneficial to the upgrading of enterprise technology level, because the industrial transfer requires the existence of gradient difference, i.e. the transfer of high production technology level to the local production technology level, so the undertaking of eastern industries can promote the upgrading of Chongqing's industrial technology level and thus promote industrial upgrading.

#### **5.3.2 Give full play to the advantages of clusters and promote industrial upgrading**

Scientific development of industrial parks, give full play to the effect of industrial clusters, the cluster of enterprises can share resources, give full play to the advantages of the digital economy to improve the ability of enterprises to collect, preserve and analyze economic information, further promote the improvement of enterprise production efficiency, industrial clusters play a role in promoting the development of the regional economy, the benign interaction between enterprises, strengthen cooperation, so that the cluster industry has a good competitive environment [12]. The advantageous industries then drive the surrounding industries to cultivate product research and development capabilities, and enterprises focus on the introduction and training of professional and technical personnel to improve the level of environmental construction using existing industries, explore relevant professional fields, and establish a strong technical support institution through continuous innovation so as to promote industrial upgrading within the scope.

#### **5.3.3 Improve economic system reform in line with social development**

Government's supervision and guidance to promote industrial upgrading. First, the government should improve the market system, accelerate structural adjustment, promote capital flow, and create a good market environment for the entry of domestic and foreign enterprises; second, Chongqing should vigorously develop infrastructure such as highways, railroads, shipping, and communications to provide superior conditions for undertaking the flow of industrial products and technicians; third, establish a transparent foreign investment policy, improve laws and regulations for foreign-invested enterprises, protect the treatment of foreign-invested enterprises, and Standardize the operation of foreign investment and ensure the legitimate rights and interests of foreign investors; fourth, the government should focus on supporting industries with comparative advantages, improve the level of supporting facilities, and promote industrial structure upgrading and regional economic development; fifth, accelerate the development of adult production factor markets and promote the cross-regional flow of production factors.

## **6. Suggestions**

### **6.1 Establish enterprise technology innovation system**

First, through financial funds, tax breaks, etc., the government should strengthen the institutional framework for innovation in digital technology and encourage financial investment in the sector; second, establish a mutual assistance platform to give enterprises consulting services when they meet difficulties in technological innovation, and be able to provide targeted transformation programs to help enterprises in the digital transformation can be smooth. At the same time, it is also necessary to

lower the threshold of entry to the fund declaration and give appropriate subsidies to traditional enterprises that are transforming to the digital economy.

Enterprises make full use of artificial intelligence, cloud computing, big data and other digital technologies to transform traditional industries and transform relatively backward production methods and business models. In this regard, the leading regional enterprises should play a demonstration role and mobilize the capital market to be active and able to keep pace with the digital transformation with the support of government policies.

## **6.2 Improve the industry's ability to support itself and its ability to grow in a coordinated manner**

Science and technology innovation should be used as a leader to improve and optimize the supply chain of the industrial chain, deploy innovation platforms according to Chongqing's industrial transformation and upgrading needs, and lead enterprises to increase investment in R&D and optimize their industrial production structure through fiscal, tax and financial policies. At the same time, the government also needs to accelerate the construction of a modern industrial system, which promotes the resilience and competitiveness of the industrial chain, and should focus on promoting industrial transformation and upgrading to accelerate the modernization of the industrial chain.

The dynamic expansion of the digital economy is required for the optimization and improvement of production methods, so it can promote the expansion of high-tech, capital-intensive businesses. The digital economy, secondary, and tertiary industries in the national economy will further coordinate and optimize the structural ratio of primary industries, improving the rationalization of industrial structure, where the fundamental meaning of industrial rationalization is to change the absurd production methods in order to increase economic benefits, and then achieve the effective distribution of factors, so that the coordinated and balanced development of each industry.

## **6.3 Optimize the development environment**

A big reason for the difficulty of digital transformation of enterprises is because of the difficulty of financing, without sufficient funds, SMEs cannot keep up with the leading enterprises and gradually fall behind, which will form a vicious circle. In order to solve the problem of financing difficulties, the government should play an official role in supporting small and micro enterprises, and formulate relevant policies, such as tax breaks and lower loan interest rates for enterprises under the scale, and inclusive small and micro enterprise loan deferment with credit loan support, etc. These monetary policies can effectively alleviate their financing difficulties.

## **7. Conclusion**

The western region's economic development can be aided by the digital economy, which may also help businesses adapt their business models and economic structures. This is a significant strategic growing industry in China. The study of this paper analyzes the industrial upgrading in the western region through empirical evidence, and shows that with the support of digital information technology, the industrial upgrading in the western region is flourishing, which is reflected in breaking the shackles in industrial transformation and upgrading, and promoting the innovative development of enterprises and their digital transformation. At present, the western region has a great advantage in terms of optimal government policies and unique regional advantages, both in terms of full support from the government and in terms of its own areas of development. However, there are still problems in technology, such as the lack of enterprise technology development capabilities, shortcomings in the supply chain and the general industrial development environment. In this regard, this paper also puts forward corresponding suggestions, for the lack of enterprise science and technology development capacity, enterprises should increase investment in scientific research, in which the government acts as a backing role, mainly to solve the platform, funding issues, so that enterprises can have a place to consult, and money to do. At the same time, the shortcomings of the industrial

chain supply chain is also a problem that can not be ignored, which makes some industries in the production process by the shackles of other countries, a technology blockade can make many enterprises can not develop. Therefore, this paper believes that the western region should enhance the supporting capacity of industrial chain, and strive to break through the key technologies of high-tech industry. In short, there is little doubt that, against the backdrop of the digital economy, the advancement of digital information technology can support the modernization and industrialization of the western region.

## References

- [1] China Digital Economy Development Index Report (2022), The Fifth Institute of Electronics, Ministry of Industry and Information Technology [Z].2022-07-07
- [2] Han Jian,Li Jiangyu. Research on the influence mechanism of digital economy development on industrial structure upgrading [J]. Statistics and Information Forum, 2022,37(07)
- [3] Cao Pingping,Xu Xiaohong,Li Zhuangzhuang. Regional differences and spatial convergence trends of digital economy development in China[J]. Statistics and Decision Making,2022,38(03)
- [4] Xiong Renyu. Three types of costs of industrial upgrading[J]. 21st Century Business Herald
- [5] Fan Hengshan. Vigorously Promoting High-Quality Economic Development in the Western Region - Preface to the Research Report on High-Quality Economic Development in Western China (2021) [J]. Regional Economic Review, 2022 (01)
- [6] Li J. Analysis of the obstacles of China's central and western regions to undertake industrial transfer from eastern regions [J]. Journal of Southwest University for Nationalities (Humanities and Social Sciences Edition). 2010,31(12):156-160
- [7] Chen Qingke. Research on the impact of foreign trade on the upgrading of industrial structure in western region [D]. 2021.6
- [8] National Development and Reform Commission of the People's Republic of China. Catalog of Encouraged Industries in the Western Region (2020) [Z]. 2021-1-18. [http://www.gov.cn/zhengce/zhengceku/2021-01/26/content\\_5582791.htm](http://www.gov.cn/zhengce/zhengceku/2021-01/26/content_5582791.htm)
- [9] Lu Qixiu, Yang Junfeng. Power battery industry chain accelerates westward [N]. China Energy News,2022-08-08
- [10] Cao ZB. Chongqing releases action plan for the construction of major new infrastructure projects from 2020-2022 [N]. Chongqing Daily,2020.6
- [11] Wu Gang,Xia Yuan. Stabilizing the supply chain of the industry chain is to stabilize the basic plate of development [N]. Chongqing Daily,2022-02-09
- [12] Wen Fei. Study on Chongqing manufacturing industry upgrading strategy from the perspective of global value chain [D].2010.5