УДК: 930.25: 616.98:578

ВЛИЯНИЕ ЦИФРОВИЗАЦИИ НА РАЗВИТИЕ ВЫСОКОТЕХНОЛОГИЧНЫХ ОТРАСЛЕЙ ПРОМЫШЛЕНИЙ

Чжун Чжэ[1)], Т. И. Маслюкова[2)]

[1)] *магистрант, Белорусский государственный университет, г. Минск, Беларусь, 986190916@qq.com*
[2)] *кандидат физико-математических наук, доцент, Белорусский государственный университет, г. Минск, Беларусь, masljukova@bsu.by*

В эпоху цифровых технологий, с усовершенствованием международной системы разделения труда и совершенствованием цепочки создания стоимости, основными способами участия стран в международной конкуренции являются технологическая конкуренция, конкуренция высококлассных талантов и конкуренция в области НИОКР. Развитие высокотехнологичных отраслей с концентрированными технологиями и талантами привлекло внимание всего мира, а глобальное производство высокотехнологичных отраслей быстро росло. В этой статье в качестве основной части рассматривается цепочка экономической структуры Китая, а также представлены тенденции развития Китая в различных высокотехнологичных отраслях и направления его будущего развития.

Ключевые слова: цифровизация; высокотехнологичная промышленность; промышленное развитие.

THE IMPACT OF DIGITALIZATION ON THE DEVELOPMENT OF HIGH-TECH INDUSTRIES

Zhong Zhe[1)], T. I. Masljukova[2)]

[1)] *master student Belarusian State University, Minsk, Belarus, 986190916@qq.com*
[2)] *PhD in physical and math, associate professor, Belarusian State University, Minsk, Belarus, masljukova@bsu.by*

In the era of digital technology, with the improvement of the international division of labor system and the improvement of the value chain, the main ways for countries to participate in international competition are technological competition, high-end talent competition and R&D competition. The development of high-tech industries with concentrated technology and talent has attracted global attention, and global production of high-tech industries has grown rapidly. This article takes China's economic structure chain as the main body and introduces China's development trends in various high-tech industries and its future development direction.

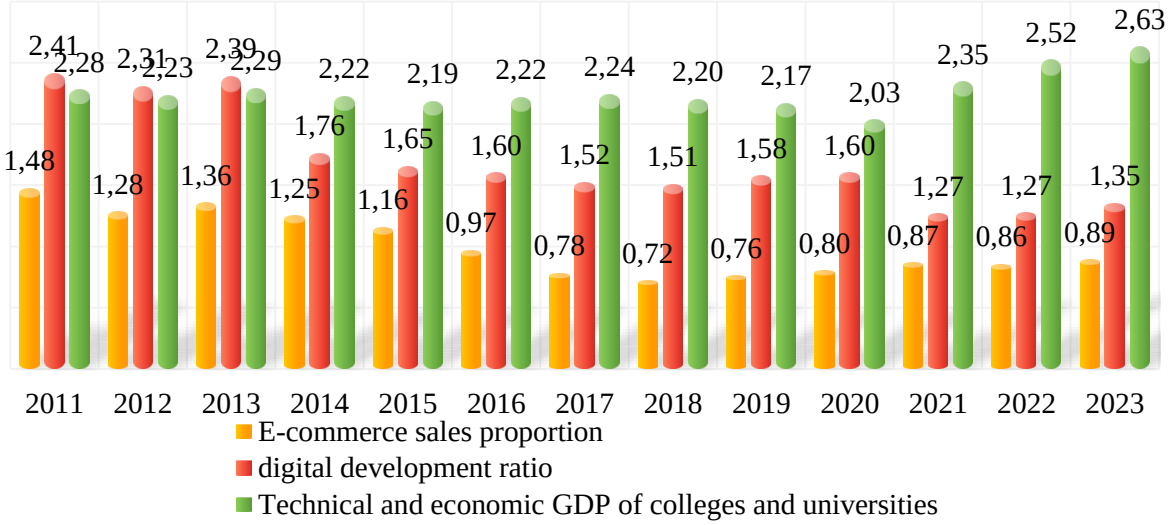
Keywords: digitalization; high-tech industry; industrial development.

In Don Tapscott 's book «Digital Economy: Hopes and Dangers in the Age of Networked Intelligence» in 1996. The book believes that the economic model

that presents the flow of information in a digital way is the digital economy [1]. When Mesenbourg defined the digital economy, he mainly started from the status of computers in the digital economy. He believed that the digital economy should include three parts: e-commerce infrastructure, e-commerce and e-commerce [2]. With the development of the digital economy, digital knowledge and information have become key production factors and have penetrated into various industries. All walks of life have become a new engine for global economic recovery and have played a significant role in the development of the real economy, especially the manufacturing industry.

Its leading role and supporting effect have attracted widespread attention from countries around the world.

Figure shows China's digital economic integration testing trends in the past ten years.



Digital economy integration measurement trends from 2011 to 2023

China's high-tech production and trade have developed rapidly. As can be seen from Table 1, China's high-tech industry as a whole showed a growth trend in production from 2009 to 2022. In terms of production scale, the high-tech production volume in 2009 was 3035.03 billion US dollars, and the production volume will reach 9653.21 billion US dollars by 2023 [3], which is three times that of 2009, an increase of 215.1% in 14 years, and an average annual growth rate of 15.42%. Due to the impact of the financial crisis in 2023, the high-tech industry in 2009 The industry has experienced a decline in absolute numbers of production, with slight declines as recently as 2015 and 2016. From the perspective of growth rate, the growth rate in 2010 reached a peak of more than 30%. The growth rate slowed down significantly after 2011, with the growth rate not exceeding 10%. There were negative growth in 2019 and 2020 respectively, and the production volume increased year-on-year. Decreased by

0.82% and 2.83%, and rebounded in 2017 and 2023. In recent years, high-tech production has grown slowly and fluctuated, indicating that China's high-tech production development is facing difficulties and is greatly affected by domestic and international factors.

Table 1

China's high-tech industry production scale from 2019 to 2023

years	High-tech production (One hundred million U.S. dollars)	Generate growth rate (%)	Proportion of China's total output (%)
2016	7753.20	8.81	39.36
2017	8492.18	9.53	39.50
2018	8630.51	1.63	38.53
2019	8559.68	-0.82	40.00
2020	8317.08	-2.83	41.79
2021	8674.31	4.29	39.07
2022	9587.84	10.53	39.62
2023	9653.21	11.20	39.87

As shown in Table 1, from the perspective of production proportion, China's high-tech industry's share of goods trade production has decreased, showing an overall downward trend. It accounted for 43.67% in 2009 and 39.62% in 2023, with an overall decrease of 9.28%. Production The absolute increase in scale has not brought about an increase in the proportion of production, and the revealed comparative advantage has declined. It is necessary to change the large-scale but not refined high-tech production. In order to better play the role of production in driving the economy, it is necessary to improve the quality of high-tech production and improve production. The scientific and technological content will enhance the international competitiveness of high-tech industries.

Transactions and trade in China's high-tech industries are developing rapidly, and the overall transaction scale is growing. It can be seen from Table 2 that China's high-tech industry transactions increased from US$256.309 billion in 2009 to US $7356.27 billion in 2023. In 2023, it was 2.84 times that of 2009, an increase of 184% in 14 years. The average annual growth rate of high-tech industry transactions is 13.14%. Also affected by the international financial crisis, transactions decreased in 2009. In 2013, 2019 and 2020, transactions in the high-tech industry declined to varying degrees for three consecutive years. The transaction trend of the high-tech industry is basically consistent with the production trend, and production is always greater than transaction. Judging from the transaction growth rate, the growth trend has slowed down. In 2010, the high-tech industry transaction volume increased by 23.54% year-on-year. From 2011 to 2023, the transaction growth rate continued to decline. The growth rate in 2021 was 16.28%. There was negative growth in 2013, with a decline of 8.57%, which was

also the year with the largest decline. The growth rate was the largest in 2014, exceeding 30%. In 2014, 2015 and 2016, the transaction volume of high-tech industries decreased by 1.4%, 1.57% and 4.07% respectively. The transaction growth rate in 2023 was 13.43 %, which was lower than the growth rate in 2009. Transactions in high-tech industries fluctuate greatly.

Table 2

China's high-tech industry production scale from 2019 to 2023

years	High-tech industry transaction volume (One hundred million U.S. dollars)	Transaction growth rate (%)	of China's R&D revenue (%)
2015	5116.82	0.11	32.38
2016	5634.84	0.10	33.94
2017	6258.96	0.11	34.97
2018	6171.27	-0.01	34.10
2019	6074.39	-0.02	38.69
2020	5827.35	-0.04	38.85
2021	6408.95	0.10	36.83
2022	7269.78	0.13	35.99
2023	7356.27	0.15	36.71

As shown in Table 2, from the perspective of transaction proportion, China's high-tech industry transactions accounted for an overall decrease in the proportion of all trade transactions in China. In 2009, the proportion of high-tech industry transactions was 45.36%. By 2023, the transaction proportion dropped to 35.99%. nearly 10 percentage points. In 2010, the proportion of high-tech industry transactions was the largest, reaching 46.43%, and in 2011, the proportion of high-tech industry transactions was the smallest at 32.38%. The absolute scale of high-tech industry transactions has increased, and the proportion of China's trade transactions has decreased. The focus is on the quality rather than the quantity of high-tech industry technology and equipment, and the transaction of high-tech equipment is used in the production of high-tech rigid-demand industries.

Table 3 shows the proportion of various industries in the high-tech industry. In terms of share, the electrical and communication equipment industry has the highest share, accounting for more than half of the total high-tech production. The production share will reach 61.48% in 2023. The total production of electronics and communications and computer office equipment accounts for more than 90% of high-tech production. It can be seen that the production of high-tech industries is mainly driven by these two industries. However, the production proportion of electronic computers and offices was the only one among the five subdivided industries that saw a decrease in its proportion, decreasing by about 6.4 percentage points, from 36.47% in 2009 to less than 30%. The production proportion of aerospace vehicles does not exceed 1%, which is the smallest production proportion

among all high-tech industries. The production proportion of pharmaceutical manufacturing is less than 2%, and the production proportion of nanotechnology first increased and then decreased. In 2018, the production share reached a maximum of nearly 8%, and then declined.

Table 3

Proportion of R&D in various high-tech industries

years	Pharmaceutical manufacturing	aerospace vehicle	Electronic and communication equipment	Computers and office equipment	nano technology
2015	1.54	0.45	60.69	29.41	7.92
2016	1.45	0.48	64.32	26.35	7.39
2017	1.55	0.65	64.48	26.15	7.18
2018	1.59	0.80	67.87	22.54	7.20
2019	1.62	0.82	69.85	20.93	6.78
2020	1.73	0.88	60.54	30.07	6.78
2021	1.81	0.85	61.48	29.72	6.14
2022	1.85	0.88	63.58	30.72	6.64
2023	1.91	0.83	64.67	31.23	6.78

This article compiles and calculates data on China's high-tech industry exports and imports from 2009 to 2023, and analyzes the scale of high-tech industry imports and exports, the industrial structure of imports and exports, and the main import and export markets. The following conclusions can be drawn: First, the absolute scale of China's high-tech industry exports and imports is growing, but at a slower pace. Regardless of whether they are exports or imports, their proportions in China's exports and imports of goods trade are on a downward trend, indicating that competitiveness has declined; Second, the export scale of China's various high-tech industries varies greatly, and it relies heavily on the export of electronic and communication equipment and computers and office equipment. The export value of these two types of industries accounts for more than 90% of the export of high-tech industries; aerospace vehicles with high technical content the minimum export scale of manufacturing is less than 1%.

References

1. *Kun-Huang Huarng, Tiffany Hui-Kuang Yu, Wenhsiang Lai.* Innovation and diffusion of high-tech products, services, and systems // Journal of Business Research. 2015. № 68(11).

2. *Chen Xiaohong*. Analysis of technology integration and application innovation trends in the digital economy era // Journal of Central South University (Social Science Edition). 2018. № 24(05). P. 1–8.

3. *Śledziewska K., Akhvlediani T.* What Determines Export Performances in High-tech Industries // Central European Economic Journal. 2017. № 1(48).