DIGITALIZATION OF THE CHINESE ECONOMY AND SOCIETY

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ABSTRACT
The main aim of the article is to study the actual topic of the digital economy of the People’s Republic of China, as well as the digitalization of Chinese society. The research work analyzes the phenomenon of the digital economy and the mechanisms of its implementation in China. The main aim of the work is to study in detail the digitalization of the economy of modern China, the role of the digital economy in the development of the PRC and the introduction of digital technologies in public life. The methodological basis of the study was general humanitarian research methods: comparative-historical and generalization method, which allowed us to draw reliable conclusions. The article would be interesting both to practicing economists, international experts, historians, and political scientists, as well as teachers of educational programs related to the world economy, the economy of China and international relations.


DIGITALIZAÇÃO DA ECONOMIA E SOCIEDADE CHINESA

DIGITALIZACIÓN DE LA ECONOMÍA Y LA SOCIEDAD CHINA

RESUMO


RESUMEN
El objetivo principal del artículo es estudiar el tema actual de la economía digital de la República Popular China, así como la digitalización de la sociedad china. El trabajo de investigación analiza el fenómeno de la economía digital y los mecanismos de su implementación en China. El objetivo principal del trabajo es estudiar en detalle la digitalización de la economía de la China moderna, el papel de la economía digital en el desarrollo de la República Popular China y la introducción de tecnologías digitales en la vida pública. La base metodológica del estudio fueron los métodos de investigación humanitaria general: método histórico comparativo y de generalización, lo que permitió sacar conclusiones fiables. El artículo sería interesante tanto para economistas en ejercicio, expertos internacionales, historiadores y politólogos como para profesores de programas educativos relacionados con la economía mundial, la economía de China y las relaciones internacionales.

INTRODUCTION

The definition of the “digital economy” has evolved along with related technologies. The information and communication technology (ICT) segment has overgrown in recent decades, from microelectronic components in the 1940s, the creation of the first computer in the 1960s, the launch of the Internet in the 1990s, to recent developments in blockchain, artificial intelligence, and robotics. These technological innovations have created new industries such as e-commerce, digital financial technology (FINTECH), and driverless cars. The digital economy can be viewed in a narrow and broad sense. The emergence and rapid spread of new technologies in recent years has generated a new wave of discussion about the digital economy. The narrow definition of the digital economy applies only to ICT-related industries: telecommunications, Internet, IT services, manufacturing of components and software, etc.

The broad definition includes both ICT industries and part of the “traditional” economy where digital technologies are being introduced. The G20 uses the second approach and considers the digital economy as “a broad list of economic activities that involve the use of digital knowledge and information as a key factor of production, as well as modern information networks as the main medium of activity” (G20 Digital Economy Development and Cooperation Initiative).

There are many approaches to measuring the digital economy. OECD’s (Organization for economic cooperation and development) index of

the digital economy is based on a narrow approach to the definition of the digital economy. According to the OECD, the share of the digital economy in China’s GDP is 6%. Chinese Academy of information and communication technology (CAICT, this methodology is based on separate calculation of the volume of digital and non-digital capital stock; the amount of digital capital is added to the size of the digital economy) uses a broader approach and estimates the size of China’s digital economy at 30% of GDP—twice as much as in 2018. Chinese companies Tencent and Caixin (Tencent – Chinese IT company; Caixin – leading Chinese news agency) have developed a methodology for evaluating the digitalization of industries in the “traditional” economy, which is not based on the system of national accounts. In addition, there are many mixed indices that combine indicators of digital readiness (for example, the development of IT infrastructure and the level of mobile penetration) and indicators of the development of individual digital industries (for example, the volume of e-commerce). These indexes include the World Bank’s digital adoption index, the Fletcher School’s digital evolution index, the world economic forum’s network readiness index, and the State statistical office’s digital economy index.

METHODS

Main methods of this research are descriptive and comparative methods. They help to overview the problem posed as a whole. In addition, the methodology of research approaches allows us to see the main trends in the development of China’s digital economy, to evaluate the diverse mechanisms of China’s innovation initiatives, as well as to analyze the prospects for the development of digital technologies in terms of digital economy. The theoretical and methodological basis for the study was the conceptual position of scientific research in the field of studying modern international economy. Using the methodology of existing researches contributes to a better understanding and in-depth analysis of the impact of global digitalization on the economy of the PRC.

RESULTS AND DISCUSSION

Since the beginning of China’s policy of reform and openness in 1978, the country’s information and communication technologies have grown enormously [https://doi.org/10.32861/jssr.spi5.157.160.2018]. Starting with the development of microelectronics and the advent of computers in the 1980s, the Internet in the 1990s, in the 2000s, there are robotics, artificial intelligence, “blockchain” technology, “big data”. In recent years, China has seen an increase in the digitalization of the economy, mainly in such areas as e-commerce, financial technology, and manufacturing. Elements of the digital economy are increasingly present in the daily lives of citizens. In terms of the overall level of digitalization of the economy, China occupies an average position. According to the narrow definition of the digital economy [according to the OECD methodology], China’s digital economy creates about 6% of GDP [https://www.imf.org/en/Publications/WP/Issues/2019/01/17/Chinas-Digital-Economy-Opportunities-and-Risks-46459 (Address date: 20.05.2019) 2019]. In South Korea and Japan, this figure reaches 8-10%, since in these countries the IT sector is more developed and is the basis of the economy.
A broader approach to the definition of this concept, proposed by the Chinese Academy of information and telecommunications technologies (CAICT), gives an indicator of 3% of GDP. In the case of the United States, this figure reaches 59%, in Japan – 46% and about 20% in Brazil, India and South Africa [Kostka2020]. Although mixed indices are not very suitable for measuring the digital economy, they can be useful for making comparisons on a large scale, given the large scale of assessment and comparability of results: according to the World Bank’s digital adoption index, China is ranked 50th out of 131 countries; 59th in the world economic forum’s ranking; 36th out of 62, according to the Fletcher School’s digital evolution index. It should be noted that these ratings represent an average indicator for the entire economy and, therefore, do not reflect the difference in the level of digitalization of individual sectors of the economy and regions of China.

Some of them are more “digital”, such as e-commerce and financial technologies, and the coastal regions are particularly distinguished among them. Nevertheless, China has become a global leader in some key digital industries. In terms of the overall level of development of the digital economy, China lags developed economies, but in some sectors it has become a leader:

**E-commerce.** China accounts for more than 40% of all transactions in the world, and the level of e-commerce adoption (as a percentage of total retail sales) reaches 15%; in the US, this figure reaches 10% [http://www.aliresearch.com/en/news/detail/id/21298.html (accessed 1 June 2019). (2017).]

**FINTECH.** Chinese companies account for about 70% of the global valuation of companies. The volume of consumer mobile payments in 2016 reached $790 billion, which is 11 times higher than the US’ figure. Considering the growth of the mobile payments market, it should be noted that the processing capacity of one of the largest Chinese mobile payment operators is about 3 times higher than that of its partners in the United States. Although the leading sectors of China’s economy are at an early stage of digital development, their activities are already characterized by a global reach, especially in the field of financial technologies (FINTECH) [Zhang, Chen, 2019].

**Payments.** Chinese IT giants quickly entered foreign markets.

It is noteworthy that the popular payment systems in China, Alipay and WeChat Pay, are available for use by Chinese tourists in 28 countries and regions outside of China.

**Ecommerce.** Alibaba has created a global platform that brings together sellers and buyers from more than 200 countries, with a total revenue growth rate of more than 200%. Chinese companies also contribute to the development of e-Commerce and payment systems in other countries through investments in local companies: Pay TM in India, Airwallex in Australia, Lazada in Southeast Asia. Cloud computing. Alibaba created an international network of 14 computing centers, which provided a 400% increase in revenue in the cloud computing segment [http://www.chinadaily.com.cn/business/2017-07/20/content_30179729.htm (Accessed 1 June 2019). (2017a)].

**Export of IT products.** In General, China’s share of global IT exports is 32% (in terms of value added, this figure will be lower at about 11%). Exports of ICT products account for 16% of China’s merchandise exports and about 40% of services exports, and 6% of IT services exports. In 2017, 11% of Chinese foreign direct investment was directed to the IT sector. Dajian, a leading manufacturer of drones in China, has 50% of the market for these devices in North America. China is a leading global investor in key digital technologies. The venture capital market in China is growing rapidly; the digital technology segment is particularly in demand. According to McKinsey’s calculations, the venture capital market in China has grown from $12 billion in 2011-2013 to $77 billion in 2014-2016 (from 6% to 19% of the global figure), $38 billion of which is accounted for by foreign investments. The main sectors receiving venture capital investments are big data technologies, artificial intelligence and financial technologies. China is now among the top 3 largest investors in key digital technologies, which include virtual reality technologies, driverless vehicles, 3D printing, robotics, drones and AI.

China’s advances in digital technology are driven by several factors. A significant part of the population does not have access to financial services. At the very beginning of the digital development process, the level of public use of financial services in China remained limited compared to developed economies. In 2011 64% of the adult population of China had a Bank account, while in Japan, South Korea and Germany – 90% (world development indicators). Small and medium-sized enterprises also faced limited access to credit facilities through conventional banking channels [https://hydr.ge.com.cn/upb/jiaoshengjintech.pdf (accessed 1 June 2019). (2017)]. Together, this has led to a high demand for financial services from non-Bank providers. The government has created conditions for the development of the digital economy. Investment in digital
infrastructure has played an important role in contributing to the explosive growth of digital sectors.

Thanks to public investment, the development of digital infrastructure in recent years has progressed at the same pace as in developed economies (for example, the connection speed for a fixed connection is 39 MB/s, and the download speed is 12 MB/s, which is higher than in developed economies, such as France. The share of households connected to broadband exceeded 50%–lower than the average for OECD countries, but the share of fiber connections reaches 77%, which puts China in first place in the world. By the beginning of 2016 China had 700 million 4G users, which is about 58% of all mobile users and exceeds the OECD average (CAICT)). In addition, the government has taken the path of lax regulation to promote innovation. In sum, these measures have led to a sharp increase in new sectors of the economy. Some concerns about the safety of personal data from the Chinese population have also contributed to the country’s rapid digital development.

Drivers of development – economies of scale and enthusiasm of consumers/users. Today, China is home to more than 700 million Internet users and 282 million representatives of the “digital generation” (Internet users younger than 25 years), who readily accept technological innovations. In India, the situation is different—with an almost equal population, the number of Internet users is about 60% of that of China in 2016, while in the United States, the world leader in digital innovation, less than 30 million people use the Internet with a smaller population. The system, created by major technology companies Baidu, Alibaba and Tencent (also referred to as “BAT”), uses the multi-industry structure of these companies and the ability to quickly accumulate consumer information to ensure easy access for millions of consumers to new products and services [Zhang, Chen2019].

In recent years, China has seen rapid digitalization. The scale of China’s digital economy has grown from 15% of GDP in 2008 to 33% in 2017, driven by the introduction of ICT in traditional sectors. Despite the emergence of new ICT-related sectors, their combined size remains small and hovers around 7% of GDP. On the other hand, the size of digitalized traditional sectors of the economy (for example, ICTs are increasingly used in the financial and cultural and entertainment sectors; robotics is being actively introduced into industrial production) has increased from 10% of GDP in 2008 to 25% in 2017. According to the Fletcher School index, the rate of digitalization of the Chinese economy is the highest in a sample of 62 countries.

The Chinese government sets ambitious goals to achieve a 50% share of the digital economy in the GDP structure by 2030 [https://www.imf.org/en/Publications/WP/Issues/2019/01/17]. Along with broadcasting the “one belt, one road” initiative, the Chinese leader uses international platforms to indicate the growing role of digital technologies in the country’s economy. So, in 2016 China was the host country of the Group of twenty (G-20) Summit in Hangzhou, and the BRICS Summit was held in Xiamen, China, in 2017. At the two summits, China outlined the problems of global trade, the digital economy, e-Commerce, and cybersecurity in its agenda. The tasks of implementing the policy in the field of digitalization are assigned to the state Council of the people’s Republic of China under the leadership of the Communist party of China. The area is administered by such agencies as the Ministry of science and technology, Ministry of industry and information technology, Ministry of education, the Central leading group for cybersecurity and Informatization, Commission of development and reform, as well as subordinate institutions Chinese Academy of Sciences, Chinese Academy of information and communication technologies.

The legal framework in the field of digitalization and technology has been actively developing since the early 2000s. The Chinese government has adopted such documents as the national medium—term program for the development of science and technology (2006-2020), the State strategy for the development of Informatization (2006-2020), the program “Digital economy 2020: action plan for Chinese enterprises”. The “Digital China” plan (2016-2021), which implements two programs - “Made in China-2025”, the task of which is to increase productivity using digital technologies and “green” standards, and “Internet plus” – the transformation of industry using digital technologies, mobile Internet, computerization of all existing enterprises in the PRC by 2025 [LASTOCHKINA, NOVIKOV; SOLODOVA, 2020, p. 61].

In the face of new economic forms and changes in social relations, China aims to adapt and improve Internet legislation, accelerate the formation of a complete legal system to provide stronger legal protection for the development of the digital economy. To this end, the law “on cybersecurity” (2016), the law “on electronic Commerce”, the new version of the “White paper on Internet law” (2017) were adopted. draft laws “on data security” and “on the protection of personal information” were developed.
Factors of digitalization growth in China
Let us note the key factors that contribute to the process of digitalization of the economy of modern China.

Political
- political orientation of the state towards "innovative economy" with an emphasis on innovative industry;
- high government spending on education and research;
- state support for the digital economy in a number of areas;
- political will to solve social problems and Megatrends (urbanization, demographic processes, environmental pollution, agricultural modernization, health development), which requires new digital technologies.

Economic
- undisputed economic growth of the country for many years;
- the size of the market gives China a huge domestic purchasing power;
- China "provides itself" with appliances / devices, in 2017 China has produced 97 million smart TVs, 130,000 industrial robots, and 2.9 million civilian drones. (KOSTKA, 2020);
- the government's goal is to ensure the transition from manufacturing to innovation (from the "Made in China" brand to the "Invented and developed in China" brand);
- created an ecosystem called BAT (Baidu, Alibaba, Tencent) — three national largest technology companies that provide electronic access to goods and services to millions of consumers;
- high interest of the population and business in non-bank financial services, which is explained by the relatively low involvement of the population in financial mechanisms; in 2011, 64% of the adult population had Bank accounts (90% in Japan, Kazakhstan, Germany), small and medium-sized businesses had insufficient access to Bank loans. www.bmbf.de/upload_filestore/pub/China_Strategy_Longversion.pdf (Address date: 15.06.2019). 2015-2020;
- the emergence of new jobs; for example, 11 million SMEs and 30 million jobs are registered on the Alibaba platform, 13 million drivers are registered on the Didi-taxi platform (similar to Ubertaxi), and the it sector offers 1.4 million jobs for highly qualified specialists.

Social
- population — as a resource; interest in the perception of digital technologies in society — 700 million Internet users, more than 280 million Internet users under 25 years of age, there are 4.54 million websites (in India with a similar population, the number of Internet users is about 420 million) [http://english.gov.cn/newsvideo/2018/05/29/content_281476164673878.htm (Address date: 30.05.2019)];
- a dynamic economic and social environment open to new technologies, products and services;
- ability to quickly adapt existing technologies to local needs (rapid adaptation and simulation);
- urbanization and the need to create new transport hubs and services in large cities, to solve the problems of waste processing, energy.

Security
- the state strictly regulates the Internet sphere; in the Chinese information space, there are two major messengers developed by Tencent, WeChat and QQ, as well as the social network Weibo has 500 million users; they, being popular applications in the territory of China, cover almost the entire population of the country, and this allows special authorities to collect the necessary information about users, which is aimed, inter alia, at suppressing, for example, protest actions.
• ensuring cybersecurity is a fundamentally important issue, the role of digital technologies in preventing attempts at cyber espionage is increasing, and so on.

Scientific component

• increasing knowledge-intensive production (increasing number of patent applications and publications);

• support for universities and research institutes with modern laboratories;

• the share of students, graduates and young scientists-specialists in the fields of natural and technical Sciences is growing.

Global

• China, as a world power, aims to overcome the technological gap and catch up with developed countries;

• implementation of global initiatives (“one belt — one road”, “Community of the common destiny of mankind”); China offers cooperation in such areas as innovation, new technologies, and the “Digital silk road” initiative (BALAKIN, ALIKBEROVA, 2019).

Factors hindering the process of digitalization in China

• the legislative framework is not sufficiently developed;

• increase in unemployment in a number of industries (due to automation of processes);

• strong state control of the economy and research sphere, which constrains the research component;

• high dependence in a number of industries on imports and technology transfer, insufficient level of own innovations and cooperation between science and production;

• “leakage” of highly qualified personnel abroad;

• the relative lack of well-trained workers for high-tech industries (HABIB, ZABARDAST, 2020)

SUMMARY

Studying China’s experience in the field of digital transformation of the economy is important for predicting similar processes in other countries and determining rational ways to form a digital economy. First of all, this applies to the following aspects and areas of digitalization:

1. State strategy for digital transformation and formation of the digital economy.

2. The digital economy contributes to structural reform of the economy, changing life cycle of creating products and services, helps to create a flexible, networked, and personalized production systems.

3. The digital economy will also lead to the modernization of agriculture. Thanks to the digital economy, many rural areas of China have entered the information civilization (“Taobao villages”, whose residents use e-Commerce intensively), which has led to a large number of professionals and students returning to their home towns and villages.

4. in the service sector, the impact and role of the digital economy is related to e-Commerce, Internet Finance, online education, telemedicine, Internet cars, online entertainment, etc. Online training, mobile phone booking and telemedicine services have come to the fore.

5. the Digital economy has generated many new Internet companies, which have become a driving force for stimulating innovation and entrepreneurship and have generated new economic models such as crowdfunding, crowdsourcing, government support, and crowdfunding.
CONCLUSIONS
The “Made in China-2025” program is an example of a national digitization program and represents a set of measures aimed at improving the country’s resource efficiency, in the context of rational use of labor, natural (raw materials and ecology), financial, and intellectual resources. The Program is funded by both public funds and private sources [Kasl2020]. The main focus is on the mobilization of private resources. China’s experience in creating a digital economy and digital transformation in general is of great practical value for Russia, as for many other countries. First of all, defining the goals of digital transformation and the organization of the government on the implementation of state control of digitization in the economy and society, the creation of digital platforms for interaction between state, business and population.

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REFERENCES


ZHANG L., CHEN, S. China’s Digital economy: opportunities and risks. International Organisations Research
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