

Assessing the Role of the Digital Economy in Gross Value Addition

Rozanova L.I.^{1,*} Moroshkina M.V.¹, Gienko G.V.²

¹*Institute of Economics Karelian Research Centre Russian Academy of Sciences, Petrozavodsk, Russia,*

²*PetrSU, Institute of Economics and Law., Petrozavodsk, Russia*

*Corresponding author. Email: lirzanova@mail.ru

ABSTRACT

The article discusses the impact of digital transformation on improving the competitiveness of the national economy. The methodological approach is based on estimating the weight of digital economy by proportion in the country's gross domestic product using comparison, horizontal and vertical analysis techniques. The direct and indirect potential of the digital economy in the formation of gross value added is assessed. A comparative industry analysis of value creation is carried out in the article. The study concluded that despite the small share of the digital component in gross value added, digital technologies have a significant impact on production and services. They accelerate the circulation of newly created products, contribute to the transformation of traditional sectors of the economy and the emergence of new markets and niches, and open new opportunities for inter-State partnership.

Keywords: *digital economy, digital transformation, gross value added, structure of VBS, leading industries, impact of digitalization, competitiveness, global value chains*

1. INTRODUCTION

In Russia, the digital transformation of the modern social and economic system increasingly gains momentum. In each region, serious attention is paid to the introduction of digital technologies improving the quality of life of the population and the efficiency of business and public administration [6]. The main task of research applied in the field of digital economy is to ensure national security and technological independence in the areas of use of through digital technologies and their global competitiveness. Global trends of recent years show growth and increase of weight in global production of multinational enterprises (MNEs) working in the field of information and communication technologies. According to UNCTAD, the number of Multinational Enterprises (MNEs) from the 100 largest MNEs observed doubled between 2010 and 2015. Their assets grew by 65 per cent and their operating income and employment increased by about 30 per cent, amid stagnation in the other 100 MNEs.

The amount of foreign sales is accounted for by 70 per cent of digital TPLs turnover, while they have only 40 per cent of their assets abroad.

Such companies are involved in e-commerce, Internet platforms and digital content creation, which increases their position and contribution to international production [5]. Following the global trends, the problem of digital transformation in Russia is solved at the government level. At present, a national program "Digital economy of the Russian Federation" is implemented, designed for the

period from 1.10.18 to 31.12.24 and providing for an increase in domestic costs for the development of the digital economy from all sources (by the share in the gross domestic product of the country) by at least three times compared to 2017. Creation of sustainable and secure information and telecommunication infrastructure for high-speed transmission, processing and storage of large volumes of data accessible to all organizations and households. Increasing the share of households with broadband access to the Internet from 75% in 2018 to 97% by 2024. One of the important target goals of the Program is to increase the share of socially significant infrastructure facilities (primarily, public educational organizations, medical and obstetric stations, public authorities) that have the opportunity to connect to broadband Internet access from 34.1% to 100% for the period specified

2. METHODOLOGY

The cost estimation methodology of the digital technologies used does not allow to fully disclose all investment and operating costs and is improved constantly. Thus, the indicator of internal costs of development of digital economy at the expense of all sources by the share in the gross domestic product of the country is estimated and calculated as a ratio of organizations' costs for information and communication technologies to GDP. According to the Association of Electronic Communications (RAEC) estimates, the level of costs for

digital economy development was in 2016. 1.7 trillion roubles, or about 2% of GDP.

The study is to assess the impact of the digital component on gross value added (GVA). The subject of the study is the dynamics of the sectoral structure of gross value added, including IT-industries. The analysis covers the period of the last five years from 2014 to 2018.

The research methodology uses a dialectical approach, vertical and horizontal analysis, grouping and comparing shares (weight) of different industries in the gross value added of the country. Estimating statistical data of the structure of GVA detailed for specific activities is the empirical basis of the research in question.

The research of issues of evaluation of the digital direction impact on the formation of gross value added (GVA) within the framework of modern trends is relevant. Developments in this context are conducted within the framework of basic research analyzing the development of national economies of the world community. As a result of carried out research the increasing role of digital economy and an increase in its share have been revealed. Determination of the level of digitalization of the economy is carried out in various directions. Digital changes taking place in various sectors of the economy, markets for goods and services, human resources, management processes in the UAE in 2017 are determined by the main directions of assessment of the digital economy development. Within the framework of the approaches to assessment of digital economy OECD presented 14 indicators, basing on which the Higher School of Economics estimates the level of digitalization of economy [7].

3. THE RESULTS

Studies of the information and communication technology market show that the digital transformation has significantly changed the contours of almost all economic activities. In the information provided by the Autonomous Nonprofit Organization "Digital Economy" it is noted that a fairly wide range of areas of digital technology has been implemented in Russia today. They concern such significant spheres of activity as public services, public health services, emergency medical aid, transport, building and housing and communal services, telephonization, ecology and nature management, culture, leisure and tourism, retail trade, economy and finance [2].

Digital technologies have both a direct and indirect impact on business, social and service outcomes. Our study found that industries directly involved in the creation of hardware and software products for the digital economy contribute approximately 2.7% of gross value added, a small percentage. At the same time, when comparing, for example, the share of forestry - such an important natural resource for many Russian regions that exploit forest wealth - we found much less contribution from this industry than the digital economy. Forestry and logging account for only 0.2% of the GVA, wood processing and

production of wood products - 0.3%, paper and paper products - 0.4%.

The fuel and energy sector, metallurgy, wholesale and retail trade, construction, agriculture, land and pipeline transport remain the most important sectors for the development of the Russian economy. In 2018, their contribution to value added was 45.5% in total. Structural shifts in GVA are also taking place due to new market segments and an increase in the share of some traditional industries: financial and insurance activities, real estate transactions, leasing and leases, household activities as employers and others.

Thus, we conclude that the dominant sectors remain the traditional, primarily export sectors associated with the extraction and primary processing of natural resources. However, the digital economy is becoming one of the catalysts for increasing competitiveness in many industry segments. For example, the use of digital technologies allows businesses to significantly optimize many processes both at the production stage and in the distribution of products on the market, expanding opportunities for a wider geographical coverage. The quality of decision making is also improving when receiving timely market signals using new communication standards. New computer programs of virtual modeling, robotics, artificial intelligence in work with big data help to improve production processes and reduce the cost of technological decisions. The penetration of digital technologies into the process of production process management allows not only to improve the quality of decision-making, but also to manage the product life cycle, to use modern approaches to improving its consumer characteristics using advanced technologies.

4. DISCUSSION OF RESULTS

Our analysis compares the contribution of various activities to the creation of GVA in terms of weight characteristics. The sectors with a greater share in gross value added, activities that are directly related to the digital economy are distinguished. Performance indicators for such an important natural resource as forest, important for many regions of Russia, are given for comparison. Mining industries, wholesale and retail trade, construction and agriculture remain the most significant for the country's socio-economic development. As noted in the works of other scientists, the main export sectors of the Russian economy, such as mining, metallurgy and production of oil products, form the main share of value added within the national economy: 93.5, 77.2 and 87.9%, respectively [8].

In recent years, real estate operations have made a significant contribution to the formation of gross value added. Together with renting and leasing, this type of

activity is actually comparable with the average annual rates of mining. Figure 1 shows the industries with the highest weight in the GVA (Rosstat data were used). If the influence of digital technologies is not quite obvious in most large industries, the wholesale and retail trade sector nevertheless becomes more dependent on them, demonstrating weight reduction under the influence of electronic sales of world leaders. Their digital platforms push the boundaries of the world of commerce. At the same time, the possibilities of the usual formats of retail facilities in the domestic market are narrowing due to a shift towards the priority of trading via the Internet under the influence of modern trends. Convenience of purchasing for the client, saving time, and just-in-time delivery create competitive advantages in this segment.

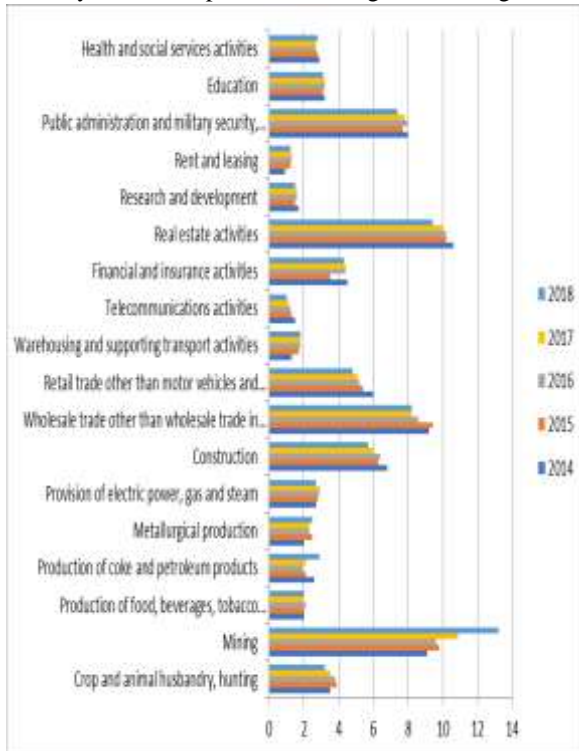


Figure 1. - The share of leading industries in the formation of gross value added (share in% of the country's GDP)

HSE studies also show that the digital economy has an impact on the development of traditional sectors of the economy, facilitates their transformation, sets new directions, and creates new markets and niches. Digitalization creates new customer centric business

models. They change value propositions, the client's need becomes more predicted. Researchers pay attention to the fact that it is high-speed processing of big data where transactions take place in real time and often at the same time becomes a key source of value creation [7, p.21].

Our study presents a grouping of individual industries, which allows us to more clearly reflect the ongoing changes in the structure of the GVA and determine the qualitative structural changes and some dominants [1]. **Table 1** shows the dominant industries that contribute more to value creation. In 2018, the share of mining was the highest - 13.2%, due to which there was a slight shift in the structure of the GVA with a negative value in many industries. Positive dynamics has been observed in the mining industry, the production of coke and oil products as well as in the metallurgical industry since 2014.

One can estimate the role of digital economy in the development of the socio-economic system and highlight a specific contribution to the formation of the GVA only in certain segments. According to Rosstat assessment of the detailed sectoral structure of gross value added, the contribution of industries related to digital technologies is shown in **table 2**. In 2019, Russia successfully switched to digital television broadcasting, providing residents of even remote territories with access to high-quality television. In many areas of activity, domestic software products are used. The development of computer software, consulting services in this area and other related services, as well as activities in the field of information technology, have been positively dynamic over the past five years [4]. It is noteworthy that one of the traditional industries, which is the basis for the specialization of regional economies of the Russian Federation, makes a less significant contribution than the digital economy (**table 3**). In total, forestry and logging, as well as processing industries based on forest resources, make up a very small share in the country's GVA.

Table 1. Share of dominant industries in VDS (%)

	2014	2015	2016	2017	2018	deviation of 2018 from 2014 (+/-)
Crop and livestock production, hunting and related services in these areas	3,5	3,9	3,8	3,5	3,2	-0,3
Mining	9,1	9,8	9,6	10,9	13,2	4,1
Production of coke and petroleum products	2,6	2,1	1,9	2,1	2,9	0,3
Metallurgical production	2	2,5	2,3	2,3	2,5	0,5
Provision of electric power, gas and steam; air conditioning	2,7	2,8	2,9	2,9	2,7	0
Construction	6,8	6,3	6,4	6	5,7	-1,1
Trade wholesale and retail including vehicles and motorcycles and their repair	16,3	15,8	14,6	14,1	13,9	-2,4
Land and pipeline transport activities	4,3	4,3	4,8	4,5	4,1	-0,2
Activities financial and insurance	4,5	3,5	4,4	4,4	4,3	-0,2
Real estate activities	10,6	10,2	10,2	10	9,4	-1,2
Public administration and military security, social security	8	7,7	8	7,8	7,4	-0,6
Education	3,2	3,1	3,2	3,2	3,1	-0,1
Health and social services activities	2,9	2,8	2,7	2,7	2,8	-0,1

Table 1.2. Share of IT industries, telecommunications in total VGS (%)

	2014	2015	2016	2017	2018	deviation of 2018 from 2014 (+/-)
Printing and copying activities	0,1	0,1	0,1	0,1	0,1	0
Production of computers, electronic and optical products	0,6	0,7	0,6	0,6	0,6	0
Production of films, videos and television programmes, recording and notes; Television and radio broadcasting activities	0,2	0,2	0,2	0,2	0,2	0
Telecommunications activities	1,5	1,3	1,2	1,1	1	-0,5
Computer software development, consulting services and other related services; Information technology activities	0,7	0,9	1	1,1	1,1	0,4
Repair of computers, personal and household items	0,1	0,1	0,2	0,2	0,2	0,1

Table 1.3. Contribution to VVA (%) of industries related to forest production and redistribution

	2014	2015	2016	2017	2018	deviation of 2018 from 2014 (+/-)
Forestry and logging	0,1	0,2	0,2	0,2	0,2	0,1
Wood processing and production of wood and plug products other than furniture, production of straw products and weaving materials	0,3	0,3	0,3	0,2	0,3	0
Production of paper and paper products	0,2	0,3	0,4	0,3	0,4	0,2
Printing and copying activities	0,1	0,1	0,1	0,1	0,1	0
Production of furniture, other finished goods	0,2	0,2	0,2	0,2	0,2	0

The analysis shows that under the influence of the digital economy as a whole, there take place qualitative structural changes. At the same time, natural resources are of great importance both for the development of the Russian economy, and the global one as well. The pace of development of the global economy is closely interlinked with their use. New technologies, however, contribute to their deeper processing, reduce the material consumption of products, and create competitive advantages. Digital technologies promote both the improvement of production processes and faster delivery of output to the market as well as broader market coverage.

In this regard, great importance is also attached to the digital agenda in the framework of foreign economic partnerships, in particular the EAEU. Research in this area is quite extensive. The interest of the EAEU member countries in the development of digital technologies is associated with the necessity of higher competitiveness of the national economy, which is important for strengthening positions not only within the Union, but also in foreign markets. According to World Bank experts, "the EAEU opens up new opportunities for cooperation on the basis of a unified network infrastructure, common digital platforms and new digital solutions that can reduce distances, overcome borders, create new jobs and develop previously non-existent areas of business activity [10].

5. CONCLUSIONS

Global transformation trends increasingly denote the role of the digital economy. Digital technologies create opportunities for the innovative development of socio-economic systems, emergence of new industries, types of services, new jobs, and increase the effectiveness of interstate interactions. Thanks to them, geographical and physical boundaries are blurred, and new prospects for economic, social and cultural cooperation between countries open up. The growth of regional and global competitiveness in the future will also be associated with the use of end-to-end digital technologies. In this regard, the role of the state in digital development increases.

Public investment in the digital economy will have important indirect and production implications, accelerate digital development, and expand the boundaries of partnership.

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