

Innovative Technological Development on the Basis of the Human Capital

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Abstract:

Studying the problems that impede economic growth, the authors consider it appropriate to consider the relationship between household income and gross domestic product. The following research methods were used: historical, statistical-economic, and monographic. The authors have revealed that the level of income of the population affects a number of macroeconomic indicators. The practical implications. An analysis of income, as a fundamental factor affecting the formation of human capital, indicates that significant human capital has been formed in the agricultural sector, which is not fully used due to the low material interest of the rural population. The article considers a number of factors that directly and indirectly affect economic growth.

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I. INTRODUCTION

The problem of economic growth and its pace is one of the most important in the economy. Its study makes it possible to understand the causes of differences in living standards between different countries in the same period and within the country in different time periods, to study the factors contributing to economic growth and its pace, to develop public policy measures to ensure and accelerate economic development. The article analyzes the dynamics and structure of Russia's GDP at current and base prices and estimates the

indices of the physical volume of gross domestic product. Attention is focused on the problem of a fair distribution of income among various segments of the population; decile coefficients and Gini coefficients are presented. In economic literature, the interpretation of economic growth is ambiguous (Derkho et al., 2019; Akhmetshin et al., 2018). So, according to McConnell and Brue, economic growth is interpreted as an increase in the production potential and a significant increase in output per capita.

Economic theory interprets economic growth as a

long-term trend of real GDP growth.

II. METHODS

The following research methods were used in the work: monographic, analysis and synthesis, comparison, statistical and economic.

The subject of study is the economic and social relations associated with the formation of incomes of agricultural workers.

The methodological basis of the study is the theoretical and methodological conclusions and provisions of the economic theory as a whole, as well as the works of economists on the formation of human capital in agriculture. The information base of the research is official statistical information provided by the Federal State Statistics Service of the Russian Federation.

III. RESULTS

The main goal of economic growth is to increase national wealth. The greater the country's production potential and the higher the rate of economic growth, the higher the level and quality of life (Bekmansurov et al., 2019; Kashirskaya et al., 2020).

The main goal of the economic growth of the state is to increase the average per capita income of the population. The statistical indicator characterizing this increase is the positive dynamics in the increase in the growth rate of national income per capita. It is worth noting that the increase in national income should be accompanied by a uniform and fair distribution of this national income among the entire population of the state, and not be concentrated in separate groups. In the authors' opinion, the more equitably and evenly

distributed national income is within the state, the more effectively the aggregate demand is used in the country (Turgaeva et al., 2020; Szydlowski, 2019; Cicek et al., 2012). Secondly, the increase in material well-being is characterized by an increase in demand for normal goods, while demand for out-of-stock goods tends to decrease. This is due to the fact that higher incomes lead to the use of higher-quality goods, which contribute to increased consumer satisfaction, and therefore, it is reflected in the increase in consumer spending on the purchase of goods and services, the aggregate amount of which leads to an increase in GDP and national income.

It is worth noting that higher GDP growth rates are sometimes achieved by lowering the quality of goods and services produced. On the contrary, lower GDP growth rates sometimes lead to greater consumer satisfaction as a result of the production of better products that better satisfy the needs of the population. It follows from here that a low but stable rate of economic growth (2-3% per year) is preferable. This can be seen by the example of Sweden – 2.36%, Switzerland – 2.54%, USA – 2.86%, Singapore – 3.14%. In India, China, Vietnam, Guinea, quantitative indicators are growing at a faster pace (6-8%), but to the detriment of qualitative indicators (Kuznetsova et al., 2019a; Akim et al., 2019).

Let us consider the dynamics of the gross domestic product of the Russian Federation as the most important indicator of the system of national accounts characterizing the final result of the production activities of resident economic units, which is measured by the value of goods and services produced by these units for final use (Table 1).

Table 1 – Dynamics and elements of GDP of the Russian Federation

Indicator	2014	2015	2016	2017	2018
GDP at current prices, billion rubles (revised in March 2019)	79,058.5	83,094.3	86,014.2	92,101.3	103,875.
<i>Elements of GDP (by expenditures) at current prices, billion rubles:</i>					
final consumption expenditures	56,418.2	58,240.5	61,389.8	65,165.5	69,333.
household	41,954.8	43,242.3	45,317.1	48,135.7	50,851.
public administration	14,173.2	14,684.1	15,728.5	16,649.2	18,049.
non-profit organizations serving households	290.2	314.1	344.2	380.6	432.
gross accumulation	17,883.7	18,603.4	20,242.8	22,189.2	23,611.
gross fixed capital formation	17,115.1	17,325.8	18,910.5	20,571.1	22,237.
change in inventories	768.6	1,277.6	1,332.3	1,618.1	1,373.
net export	5,074.4	6,700.7	4448.6	4,921.3	10,358.
export	21,425.9	23,854.1	22,137.6	23,994.3	31,932.
import	16,351.5	17,153.4	17,689.0	19,073.0	21,574.
statistical discrepancy	-317.8	-450.3	-67.0	-174.7	573.
<i>Elements of GDP (by income) at current prices, billion rubles:</i>					
remuneration of employees	37,430.5	39,745.5	41,245.4	43,884.3	48,244.
net taxes on production and imports	11,004.2	9,271.0	9,418.8	9,985.6	12,224.
gross profit of the economy and gross mixed income	30,623.8	34,077.8	35,350.0	38,231.4	43,406.
GDP in 2016 prices, billion rubles	87,757.1	85,731.9	86,014.2	87,416.4	89,387.5
Gross domestic product deflator indices (as a percentage of the previous year)	107.5	107.6	103.2	105.4	110.3
Indices of the physical volume of gross domestic product (as a percentage of the previous year)	100.7	97.7	100.3	101.6	102.3

GDP can be calculated by three methods corresponding to different stages of reproduction production, the method of using income (by expenses) and the method of generating GDP (by sources of income). All these calculation methods give the same result, subject to acceptable statistical discrepancies (Kadandale, 2019; Sergeev et al., 2017; Nikolaichuk et

al., 2017 a, b). The dynamics of nominal GDP, i.e. GDP, expressed in prices of the current period, tends to increase. However, since its growth can occur due to an increase in the price level, and even with a reduction in the real volume of production, its value must be adjusted by the value of the deflator (Fedulova et al., 2019; Goryushkina et al., 2019a, b, c;

Kolmakov, 2019). The presence of economic growth in the country should be judged by the dynamics of real GDP, i.e. GDP expressed in the prices of the base period and the indices of the physical volume of gross domestic product. Changes in the index of physical volume of GDP were most noticeable in 2016 – initially negative GDP growth moved to the area of positive values. The estimate of the index of the physical volume of GDP for 2018 amounted to 102.3% by 2017 (Kuznetsova *et al.*, 2019b).

When analyzing the structure of Russia's GDP according to the production account, it should be noted

that the economy's dependence on the fuel and energy complex remains, and with the restoration of high oil production rates, the Dutch disease becomes more acute and the growth rate of the manufacturing industry slows down. According to the Analytical Center of the Federal State Statistics Service, in 2018, in addition to mining, a significant contribution to the formation of GDP was made by construction, wholesale and retail trade, financial and insurance activities, government administration and military security, social security, and net taxes for products and imports, while the share of agricultural production was only 3.1% (Figure 1).

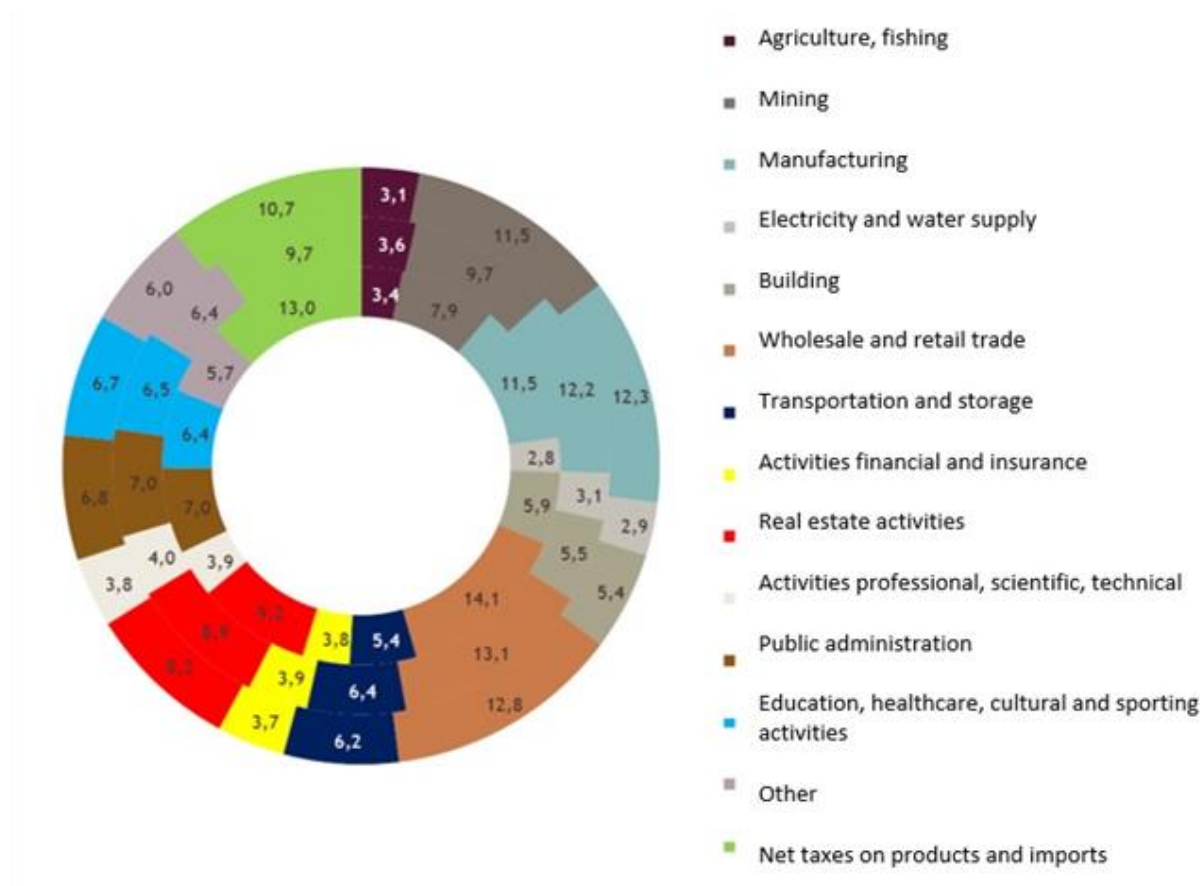


Figure 1. The structure of Russia's GDP by production account in 2014, 2017-2018 (inner circle – 2014, middle circle – 2017, outer circle – 2018) (Bulletin of current trends in the Russian economy, 2019)

Despite the revival of the Russian economy and GDP growth, the problem of significant inequality in the

distribution of income between individual groups of the population persists. The most common tools for

determining income differentiation are the decile coefficient and the Gini coefficient (Frolova et al., 2019, 2020; Glotko et al., 2019; Voronkova et al., 2019, Debbarma and Purkayasthaï, 2019; Lomova et al., 2019; Aleshko et al., 2019; Kolupaev et al., 2019;

Ghosh and Ghosal, 2019; Vlasov et al., 2019). The distribution of total cash income and characteristics of the differentiation of household incomes for 2014-2018 are presented in Table 2.

Table 2. The distribution of cash income and characteristics of the differentiation of income

Year	Cash income, total, %	20% population groups, in %					The decile coefficient of funds, times	Gini coefficient
		first (with the lowest incomes)	second	third	fourth	fifth (with the highest incomes)		
2014	100	5.2	9.9	14.9	22.6	47.4	16.0	0.416
2015	100	5.3	10.0	15.0	22.6	47.1	15.7	0.413
2016	100	5.3	10.1	15.0	22.6	47.0	15.5	0.412
2017	100	5.4	10.1	15.1	22.6	46.8	15.2	0.409
2018	100	5.3	10.1	15.1	22.6	46.9	15.5	0.411

The decile coefficient (coefficient of funds) characterizes the degree of stratification of society and shows the ratio of the average income of 10% of the richest citizens to the average income of 10% of the poorest. According to UN recommendations, it should not exceed -10. According to the preliminary statistics of 2018, the decile coefficient in Russia amounted to 15.5.

The Gini coefficient varies from 0 to 1. The closer the Gini coefficient is to 1, the higher the level of inequality (concentration) in the distribution of total income; it is believed that its value exceeding 0.4 reflects a high degree of stratification of the company. According to preliminary results, in 2018, it amounted to 0.411, which also indicates a high differentiation of incomes of the population (Kuznetsov and Suprun, 2018; Glushkov et al., 2019; Goyushkina et al., 2019; Kosenchuk, et al., 2019; Hadarah and Gani, 2019).

Agriculture is an industry that produces a significant amount of goods and services, and therefore, it is a multiplier of the entire economy. Its development determines the related food industries. On the basis of agricultural raw materials, part of textiles is produced, which means clothing and other items, as well as

leather and products made from it. However, production indicators for the manufacture of fabrics are more than negative; the dynamics of textile production in the market in 2018 was characterized by a negative trend. At the same time, the imports of fabrics continue to gain momentum (Dunets et al., 2019a, b; 2020; Pavlyshyn et al., 2019; Bozhkova et al., 2019; Sharafutdinov et al., 2017, 2018; Dmitrieva et al., 2017; Saenko et al., 2020).

According to the Ministry of Agriculture, in the framework of the import substitution policy, Russia has reached and exceeded the threshold values of the doctrine of food security for a number of key food products. The share of Russian products in the total volume of domestic market resources at the end of 2018 amounted to: 99.4% for grain and legumes, 95.7% for sugar, 81.5% for vegetable oil, 92.8% for meat and meat products, and 95% for potatoes. Over the past five years, Russia has reduced food imports by 31.2% – from \$43.3 billion in 2013 to \$29.8 billion in 2018. At the same time, analyzing its structure presented in Table 3, along with positive trends, against the general background, palm oil imports to Russia stand out significantly. They grew

19% last year, despite the fact that back in 2003, the World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations (FAO) cited evidence linking saturated fat intake with an increased risk of heart disease as compelling (Kuznetsova *et al.*, 2016; Gendler *et al.*, 2019; Hambali, 2019; Mandal and Sanyal, 2019; Gabidullina *et al.*, 2019; Kolmakov *et al.*, 2019; Mullakhmetov *et al.*, 2018; Jafarpour *et al.*, 2019).

In early 2019, WHO again raised the issue of the direct and indirect effects of palm oil on human health and called for a synergistic solution to the problem of unhealthy mass-produced and processed products.

Further development of agriculture, as a necessary element of the national economy, improving its qualitative and quantitative indicators, is possible through the use of more effective means of labor, technology, and forms of organization of production (Kashirskaya *et al.*, 2019; Frolova *et al.*, 2019;

Khormali *et al.*, 2016, 2017, 2019). The main growth factors for this industry, as well as the entire economy, are human potential, innovation, domestic and foreign demand, and investment (Kuznetsova *et al.*, 2018).

In other words, the transition to an intensive growth model is inevitable. It implies a higher level of development of productive forces, equipment, technology, a high educational and professional level of workers. Strategies to promote the development of education, training, acquisition and improvement of skills should be built for the entire working period of a person. At the same time, Figure 2 shows that in agriculture, in comparison with other sectors, the smallest percentage of workers have higher education, which does not meet the modern requirements of the post-industrial economy (Kuznetsova *et al.*, 2019c; Ahtarieva *et al.*, 2019; Yamova *et al.*, 2018; Kilinc *et al.*, 2018; Nikolaevna *et al.*, 2019).

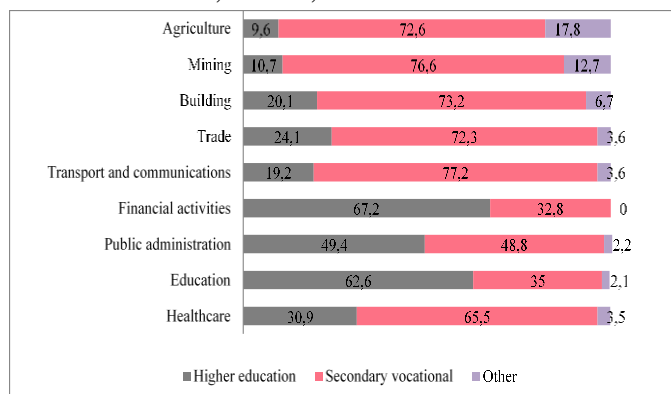


Figure 2. The educational level of workers by industry.

Modern agricultural education should allow students to acquire knowledge, skills, and competencies, necessary for professional activities in the field of production, processing and sale of agri-food products, as well as in the development of rural areas, taking into account the introduction of new technologies. Current realities require not only professional but also digital skills. So, the list of skills for workers in modern

agriculture is as follows: agronomy – data analytics, livestock – machine learning, veterinary medicine – artificial intelligence, agricultural engineering – programming, agricultural economics – cybersecurity (Garafiev *et al.*, 2019; Popova *et al.*, 2019; Sycheva *et al.*, 2019a, b; Titova *et al.*, 2019; Akhmadeev *et al.*, 2016; Bykanova *et al.*, 2017; Goloshchapova *et al.*, 2018; Kuznetsov and Suprun, 2017; Garafieva *et al.*,

2019). Specialists with relevant knowledge are able to take the country's economy to a new level.

IV. CONCLUSION

Thus, economic growth is an increase in the volume of created utilities, and taking into account the effective distribution mechanism, an increase in the standard of living of the population, which is why it is considered as one of the most important characteristics of the country's economic development.

The transition to an intensive type of growth requires a progressive restructuring of the economy, an increase in the share of high-tech industries, appropriate training of personnel, mobility of production factors, etc.

At the same time, the state should create favourable conditions to realize the opportunities available to society for economic growth by reducing the degree of monopolization of the market, increasing the efficiency of fiscal and monetary policies, expanding export supplies, and improving the system of income distribution.

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