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On the role of investments in sustainable economic growth



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The article raises one of the most acute problems of the economy – promotion of sustainable economic growth. The article substantiates the relevance of the issue for global, national and regional economies. It argues that the goal of ensuring high economic growth rates is a strategic one for the Russian Federation; the achievement of this goal will allow Russia to retain its position among the world leaders. However, this requires, first of all, the transition from the model of economy oriented to raw materials export to the innovation model.

The article shows that investments play the most important part in the promotion of sustainable economic growth. Endogenous models indicate that long-term sustainable economic growth requires investments in machinery and equipment, in human capital and in the knowledge sector. At that, the investments in human capital and knowledge are more preferable.

The results of the investment processes analysis presented in the article allowed us to draw some conclusions concerning the situation that is taking shape in the Russian Federation. In particular, there has been a decline in the share of investment in machinery, equipment and vehicles; the structure of investments in fixed capital is not optimal; the share of investment in agriculture, manufacturing and construction is reducing; investments in mechanical engineering are extremely low while this sphere is crucial for the state of country's productive capacity. The knowledge sector and branches aimed at human capital development are funded on leftovers.

The current situation is largely determined by the fact that economic entities experience a shortage of equity capital; by unfavourable lending conditions that banks offer to the real sector of the economy; by the budget crisis and the low attractiveness of the Russian economy to foreign investors.

The article concludes that to change the situation it is necessary to adjust the socio-economic policy, to abandon the resource-based model of economic development.

Economic growth, endogenous economic growth models, investments, investment structure, investment sources, socio-economic policy.

Achieving high rates of economic growth is the priority task of any state. Successful solution of this problem ensures sustainable socio-economic development, enhances people’s welfare, and determines the place and role of the country in the world economy. This explains the fact that not only economic scientists, but also politicians pay special attention to the issue of economic growth [23]. The issue becomes even more acute due to the alarming trends in the global economy that are acquiring more and more resistant character (fig. 1). After the phase of recovery growth, the world economy is experiencing another recession. The results of 2011 and 2012 prove that growth in the world economy has actually slowed down.

The issue concerning growth is very acute for the Russian economy. In 2012 Russia’s economy grew by 3.4 percent; however, the stagnation of the economy in January – September 2013 caused the downward trend in the

forecast of the growth of Russia’s GDP. In the end, the growth of Russia’s economy in 2013 will be just above one percent.

The main reason for this situation lies in the commodity-based nature of the economy, the negative consequences of which were pointed out in the report of the Director of the RAS Institute for the U.S. and Canadian Studies, RAS Corresponding Member S.M. Rogov at the session of the RAS Presidium. “Today, almost a half (about 40%) of Russia’s GDP comes from the export of raw materials. We have almost lost competitive science-intensive industry. Mechanical engineering, electronics and other high-tech industries form 7–8% of our GDP. Export of hi-tech products is only 2.3% of industrial export in Russia. In the USA this figure is 32.9% in China – 32.8%. Russia’s share in the global export of science-intensive products does not exceed 0.3%. Domestic production accounts for no more than 1% of all machine tools, purchased by the Russian

Figure 1. Gross world product, growth rates in % [16]



business. Depreciation of fixed assets in 2009 reached 46%, and it exceeds 50% with regard to machines and equipment [2].

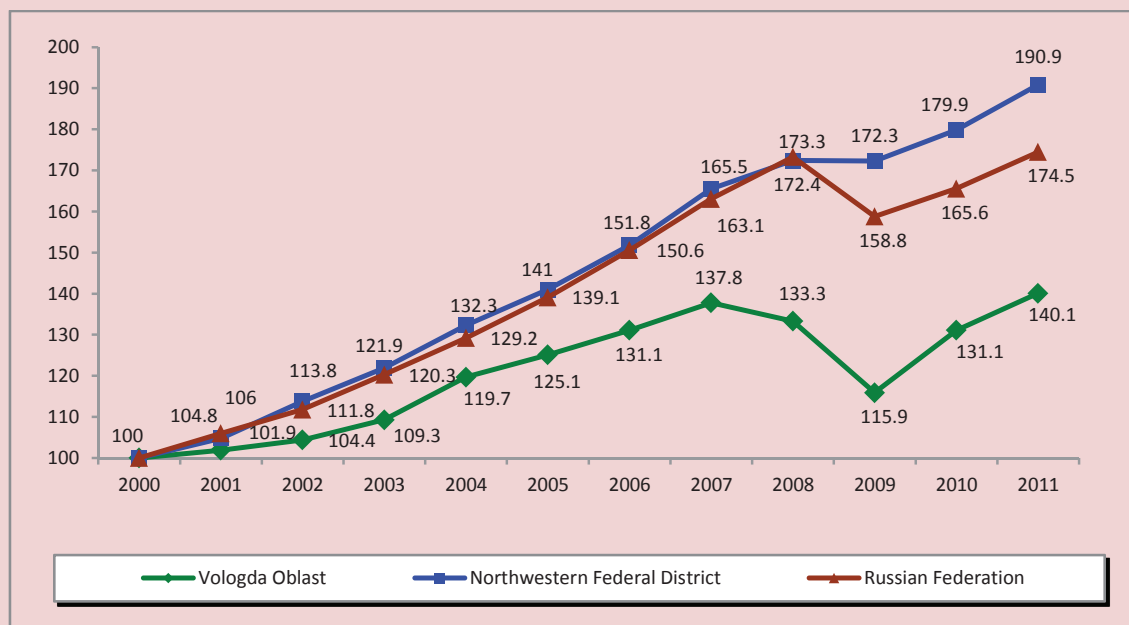
It is necessary for Russia to achieve such rates of economic growth that would exceed the global ones in order to reach the following strategic goals: to maintain the status of the great power and independent centre of influence for enhancing the population's welfare, and to develop the economy up to the level of advanced countries.

At the beginning of 2012 the then Prime Minister V.V. Putin emphasized that "it is necessary not just to increase physical volumes of GDP, but to fill the development with new quality". As President of the Russian Federation, he pointed out in his Address to the Federal Assembly on December 12, 2012: "One-sided commodity-based economy... is not just vulnerable to external shocks... And, finally, the reserves of the commodity-based model have been depleted, but Russia's development requires annual GDP growth by at least 5–6 percent in the next decade" [17].

The vulnerability of resource-based economy is clearly shown by the dynamics of the Vologda Oblast GRP (*fig. 2*). Growth rate of the gross product of the Vologda Oblast is substantially lower than in the Northwestern Federal District and Russia as a whole. The main reason for such situation in the region lies in the dependence on the external market environment, where the demand for commodities (including metal) has dropped in recent years. It is necessary to point out that the share of metallurgical and chemical industries, i.e. primary sector of the economy, is very high (about 80%). At that, the share of high-tech industries is constantly decreasing. For instance, the share of machine building accounted for 6.2% in 2000, in 2011 – for only 3.8%; the share of woodworking for this period has decreased from 8.3% to 3.5%.

Low GDP growth rates in the conditions of high world prices for raw materials and products of the first processing prove the inefficiency of the selected model of the economy based on the export of raw materials. These circumstances

Figure 2. Index of physical volume of gross product, as a percentage of that in 2000 [1]



once again show the relevance of the research into modernization of economy, its transition to the innovation way of development for achieving sustainable growth.

The study of theoretical and methodological foundations for sustainable economic growth makes it possible to conclude that investments play the major role in dealing with this issue. This is shown in the studies initiated by the works of P. Romer, R. Lucas and, a little later, S. Rebelo. The contribution of P. Romer and R. Lucas resulted in the formation of a new direction of long-term economic growth called the endogenous growth theory [11, 22]. Depending on the sources of economic growth and investment objects, the endogenous models of long-term sustainable economic growth were created.

The models with the accumulation of physical capital assume that the technology and knowledge that are embodied in physical capital become public good and, due to the spillover effect, they influence economy-wide productivity growth (fig. 3).

Assumption of R. Lucas about the possibility of continuous economic growth through investment in human capital, allowed him to create a model, according to which the investments in human capital generate an effect that increases the level of development of technologies faster than investments in physical capital do (fig. 4).

The research into the origin of technological progress and the pattern of emergence and implementation of innovations facilitated the creation of models, which present two main

Figure 3. Model of economic growth with investments in physical capital that generate the spillover effect

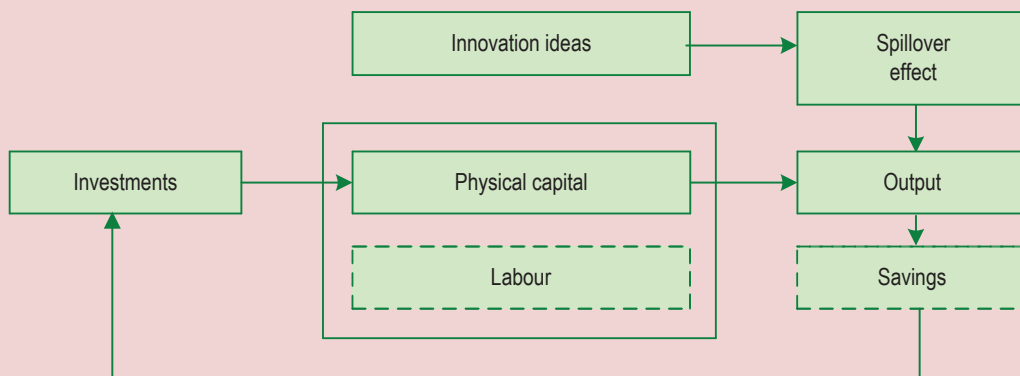
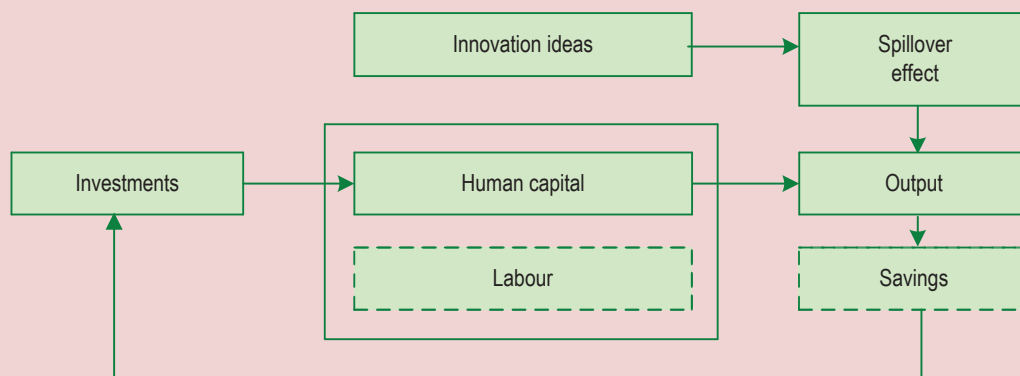


Figure 4. Model of economic growth with investments in human capital that generate the spillover effect



sectors of the economy, participating in the formation of science and technology progress: the sector for generation and accumulation of knowledge (ideas), the sector for production of goods (items) the means of production and the final product. Ideas are a tool for production of goods with a greater added value, and, therefore, they are a more significant factor in economic growth (fig. 5).

Thus, ensuring sustainable economic growth requires investments in physical capital, first of all, in machinery and equipment, in human capital, and in the knowledge sector. At that,

investment in human capital and knowledge are preferable because they create prerequisites for the emergence of scientific and technological innovations, which, in turn, serve as internal sources of sustainable economic growth.

At the same time, the analysis of investment processes in the Russian economy proves that the share of investments in machinery, equipment and vehicles is reducing. Since 2005 alone, this index in Russia has decreased by 4.7 percentage points, in the Vologda Oblast even more significantly – by 7.6 percentage points (fig. 6).

Figure 5. Model of economic growth with investments in knowledge sector

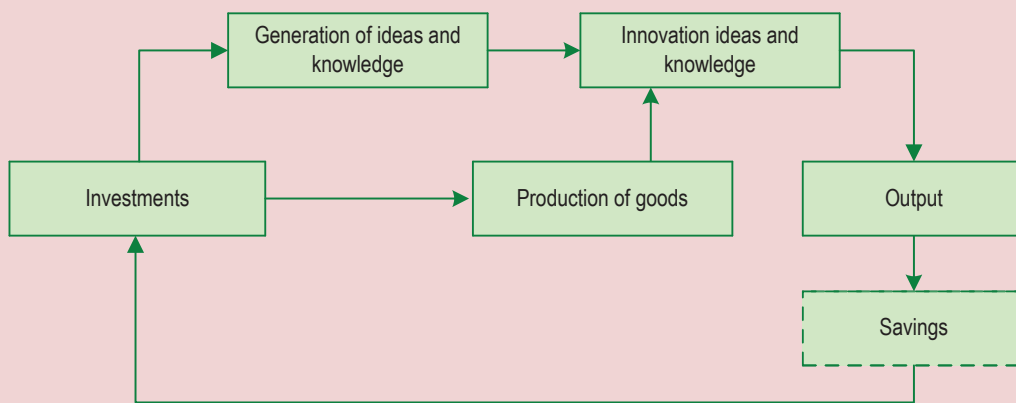
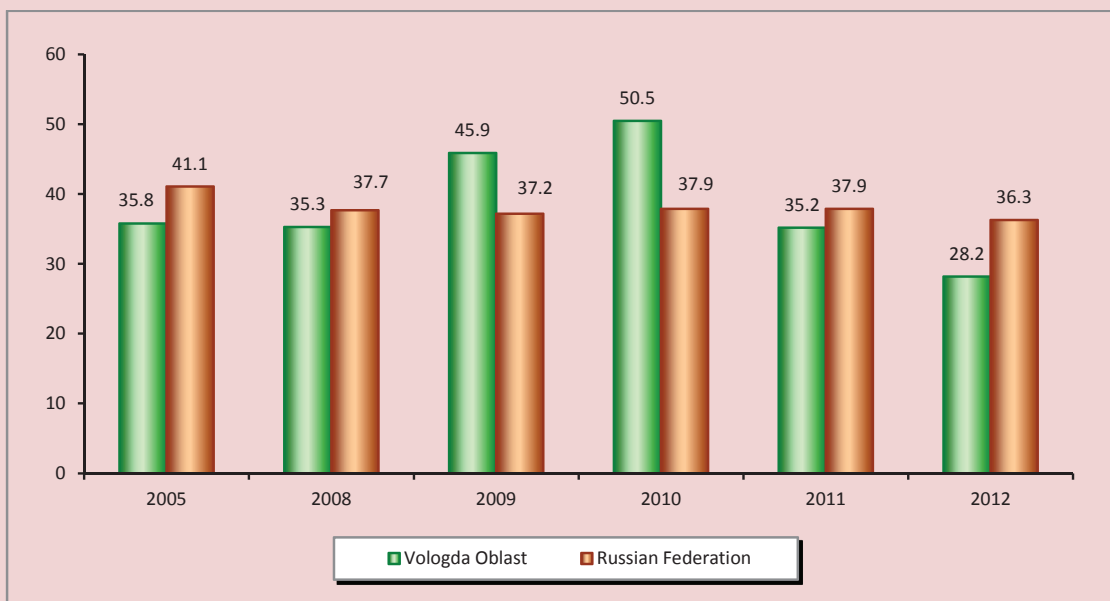


Figure 6. The share of investments in machinery, equipment and vehicles in the total amount of investments in fixed capital, percent [7, 8]



The main reason for the current situation is seen in the lack of own resources: in 2012 it was pointed out by 64% of the heads of enterprises participating in the survey¹. At the same time, the country's financial system is mainly focused on the financing of a rather small group of the largest companies integrated in the global economy. The development of mass funding can rely at present almost exclusively on bank loans [17]. However, lending conditions remain unprofitable for manufacturers because of high interest rates and high requirements to the borrowers (+5 percentage points). More than half of the respondents think so. The managers named the following main problems they had to face when obtaining a loan: high interest rate (68%); the requirement of collateral for securing loans (32%); refusal of the bank in granting long-term loans (21%); terms of the loan (20%); long procedure of loan formalization (17%).

Thus, many large-scale enterprises and the vast majority of medium enterprises remain excluded from external financing and have no funds for upgrading their facilities and infrastructure. As a result, the main production assets have a high level of physical and moral depreciation. Depreciation of capital assets in the Vologda Oblast amounted to 54.6% at the end of 2012 [18]. This, in turn, is a crucial factor determining the low competitiveness of production, and, consequently, demand.

The structure of investments in fixed capital is inefficient as well (*fig. 7*). Their main volume, as before, is directed to the raw materials sector of the economy. The share of investments in agriculture, manufacturing and construction is reducing. Similar situation is observed in the Russian regions. Moreover, the situation can be characterized as critical in many regions. For example, in the Vologda Oblast in 2012, 68% of all the investments in fixed capital were investments in transport and

communications, out of them 61.4% – investments in pipeline transport, 1.5% – investments in communication. Therefore, about 5% was invested directly in transport (*fig. 8*).

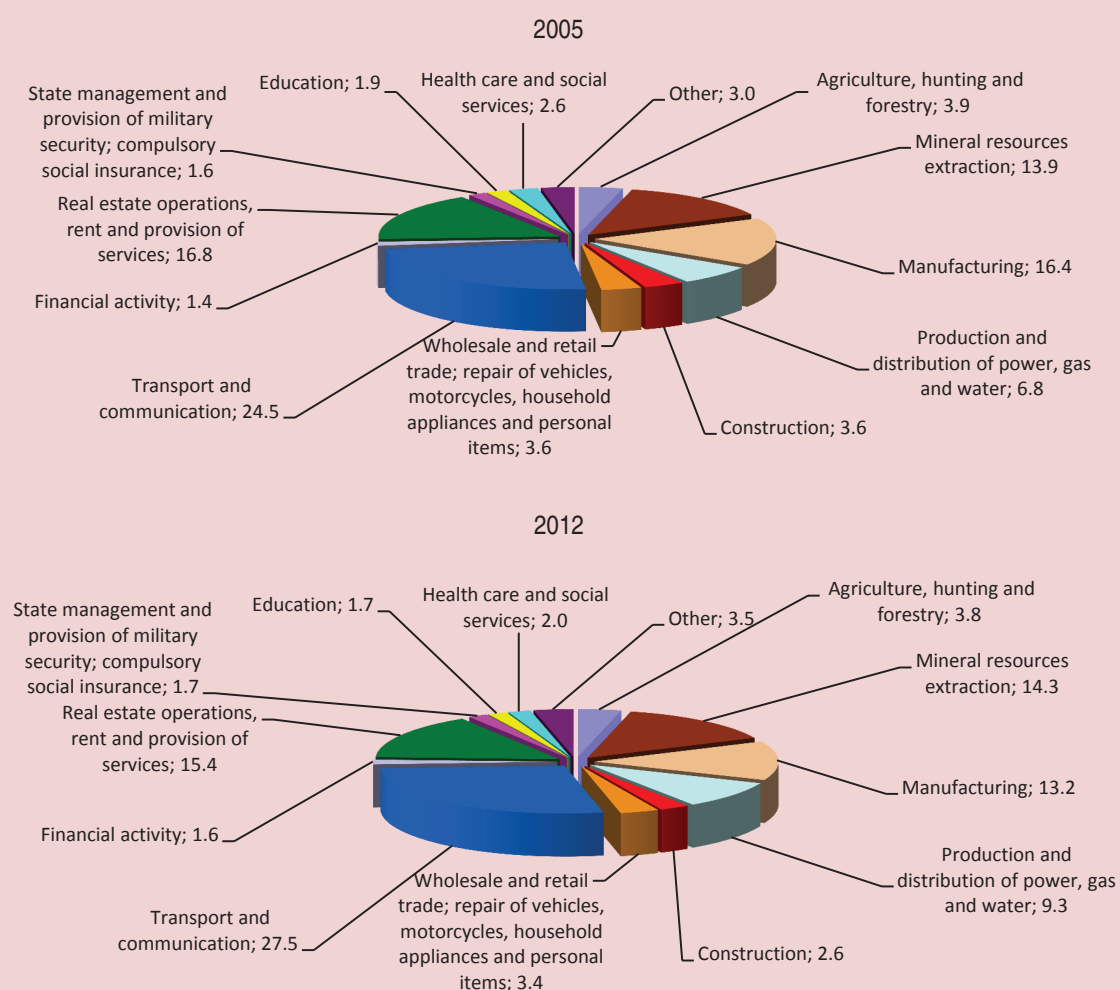
The share of finances allocated for manufacturing industries is constantly decreasing. In Russia as a whole, this figure for the period from 2005 to 2012 has decreased by 3.2 percentage points, and at the end of 2012 it was about 13%, of which only 2.6% was allocated for mechanical engineering. In the Vologda Oblast, for example, the share of investment in fixed capital of manufacturing industries for the period from 2005 to 2012 has decreased from 39.7% to 16.8%. At that, the main volume of investments was intended for metallurgical and chemical industries, i.e. for the sectors of primary processing of raw materials: in 2012 these industries received 68% (24% and 44% in metallurgy and chemistry, respectively) of all the investments in manufacturing productions. At the same time, the share of investments in mechanical engineering during this period did not exceed 1% (*fig. 9*).

At the same time, mechanical engineering should provide equipment to key sectors of the economy and, first of all, manufacturing industries; it thereby determines the state of the country's production potential. The level of development of mechanical engineering influences material consumption, energy intensity of the gross domestic product, labour productivity, industrial safety and defense capability of the state. Shortage of investments in this sector leads to reduction in industrial, intellectual and technological potential of the country and its national security; it also reduces the competitiveness of the economy and hampers its growth.

We have already pointed out that investments in human capital ensure sustained economic growth. Note that human capital is understood as a certain stock of health, knowledge, skills, abilities, and motivations formed as a result of investments and accumulated by

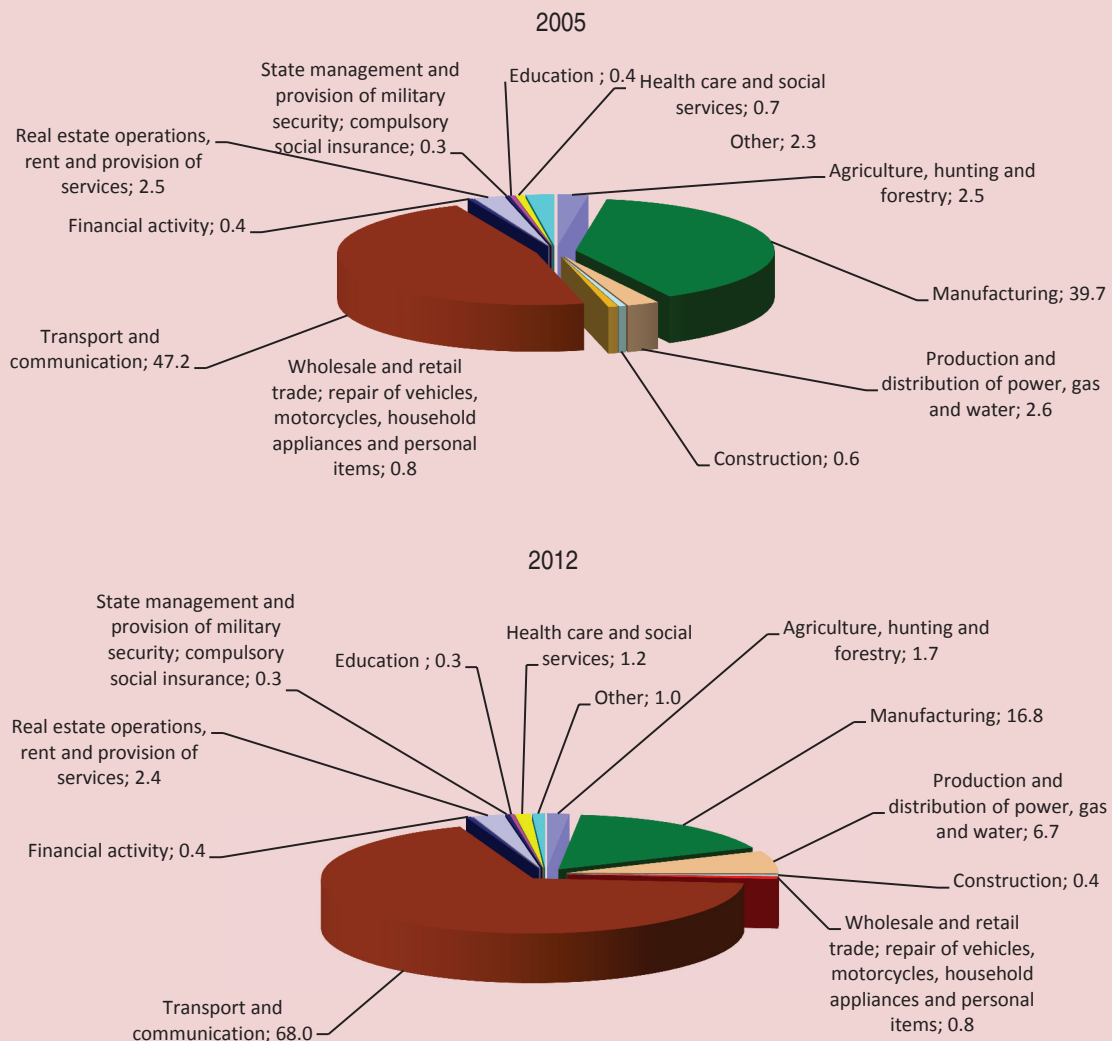
¹ The survey of enterprises' heads is carried out annually by ISED T RAS.

Figure 7. Structure of investments in fixed capital of the Russian Federation in 2005 and 2012, %



Activity	2005	2012	Dynamics, p.p.
Agriculture, hunting and forestry	3.9	3.8	-0.1
Mineral resources extraction	13.9	14.3	+0.4
Manufacturing	16.4	13.2	-3.2
Production and distribution of power, gas and water	6.8	9.3	+2.5
Construction	3.6	2.6	-1.0
Wholesale and retail trade; repair of vehicles, motorcycles, household appliances and personal items	3.6	3.4	-0.2
Transport and communication	24.5	27.5	+3.0
Financial activity	1.4	1.6	+0.2
Real estate operations, rent and provision of services	16.8	15.4	-0.6
State management and provision of military security; compulsory social insurance	1.6	1.7	+0.1
Education	1.9	1.7	-0.2
Health care and social services	2.6	2.0	-0.6
Other	3.0	3.5	+0.5

Figure 8. Structure of investments in fixed capital of the Vologda Oblast in 2005 and 2012, %



Activity	2005	2012	Dynamics, p.p.
Agriculture, hunting and forestry	2.5	1.7	-0.8
Manufacturing	39.7	16.8	-22.9
Production and distribution of power, gas and water	2.6	6.7	+4.1
Construction	0.6	0.4	-0.2
Wholesale and retail trade; repair of vehicles, motorcycles, household appliances and personal items	0.8	0.8	-
Transport and communication	47.2	68.0	+19.8
Financial activity	0.4	0.4	-
Real estate operations, rent and provision of services	2.5	2.4	-0.1
State management and provision of military security; compulsory social insurance	0.3	0.3	-
Education	0.4	0.3	-0.1
Health care and social services	0.7	1.2	+0.5
Other	2.3	1.0	-1.3

man; this stock is used appropriately in any sphere of social reproduction, enhances labor productivity and production efficiency and thus leads to the increase in earnings of an individual [3]. Therefore, human capital – the capital represented in man by the potential to bring profit based on inherent physical and intellectual abilities and knowledge and practical skills obtained in the course of socialization, education and practical activities – has the ability to accumulate and multiply. It is formed, first of all, through investments contributing to the increase in the level and quality of life, including education, health, knowledge (science), culture, art and other components. Such spheres of economy as education and health care have the greatest influence on its development. Therefore, investment in these sectors contributes to the development of human capital. However, the situation is extremely unfavorable in this sphere as well. The increase of investments in the fixed capital of sectors that are aimed at the development of human capital, slowed down in

2011–2012. In 2010 the growth was 109.2%, in 2011 – 107.5%, and in 2012 – only 102.9%. By the beginning of 2013 the investments in this sector have not reach the pre-crisis level of 2008 (they have amounted to 97.2%). The main factor that impeded the growth in 2012 consisted in the reduction of investments in education (by 6.4% after a growth by 11.3% in 2011) mainly due to reduction of capital investments in higher professional education (by 33% after the 25.6% increase in 2011). As for the investments in the fixed capital of health care, they increased in 2012 and amounted to 111.8% of the previous year. In general, however, the share of investments allocated for the development of human capital, has not even reached 4%, and it is continuously declining (*tab. 1*). Insufficient financing of industries that are aimed at the development of human capital, leads, in turn, to reduction in the number of economically active population and people employed in the economy and, consequently, to reduction in the production of gross domestic product.

Figure 9. Dynamics of investment in manufacturing industries of the Vologda Oblast, as a percentage of the total volume of investments in fixed capital [7, 8]

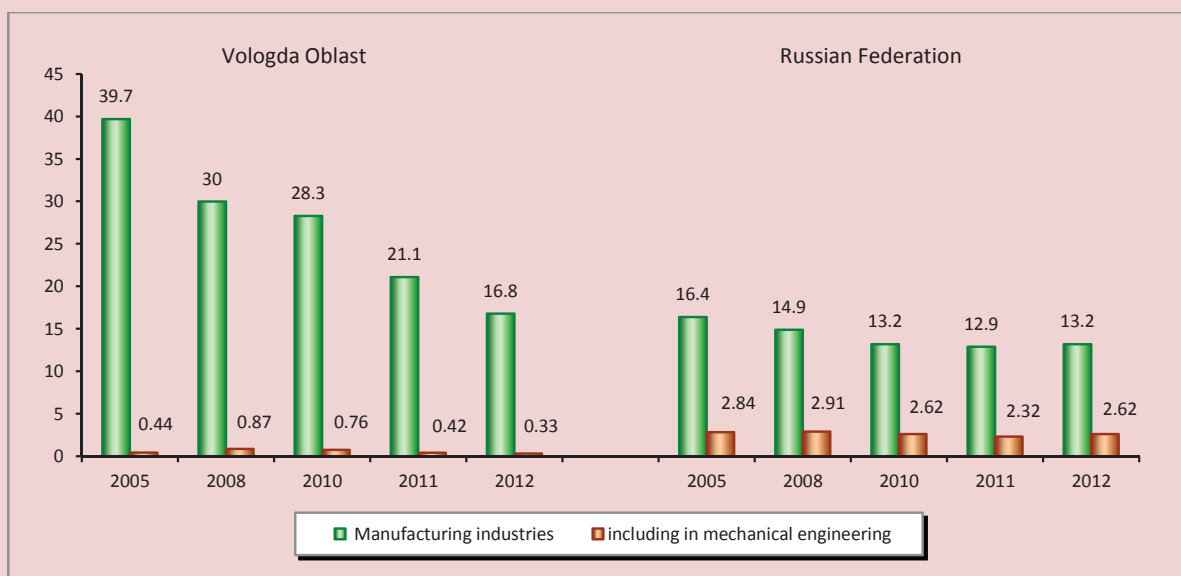


Table 1. The share of investments in the fixed capital of economic sectors aimed at the development of human potential, in the total volume of investments in fixed capital, % [7, 8]

Territory	Sector	2005	2008	2010	2011	2012	Dynamics, p.p.
Russian Federation	Education	1.9	1.9	1.8	1.8	1.7	-0.2
	Health care and social services	2.6	2.4	2.1	2.0	2.0	-0.6
	Total	4.5	4.3	3.9	3.8	3.7	-0.8
Vologda Oblast	Education	0.4	1.0	0.9	0.4	0.3	-0.1
	Health care and social services	0.7	1.5	1.9	0.5	1.2	+0.5
	Total	1.1	2.5	2.8	0.9	1.5	+0.4

In recent decades knowledge has been playing a decisive role in facilitating economic growth. Knowledge establishes the basis for innovation and creation of skilled workforce. It is no accident that science-intensive industries of manufacturing and services account for a large and increasing share of gross domestic product of the leading industrial countries. The share of industries with increased demand for knowledge (high-tech industries, telecommunications, financial and business services) in gross domestic product accounts for an average of 30–35%. In Russia this indicator is 11.5–12%. Such industries are characterized by high growth rates of output, employment, investment, foreign trade turnover. In developed countries, investments in basic research are considered as a highly efficient sphere of government spending [14, 15]. Therefore, investments in knowledge in these countries are growing faster than investments in fixed assets.

Unfortunately, the knowledge sector in the Russian Federation has been diminished significantly during the period of market transformations. For two decades (from 1992 to 2011) the number of research organizations in Russia has decreased by almost 20% (from 4555 to 3682); the number of industrial organizations that have research and design departments – by 18% (from 340 to 280). The number of design bureaus has decreased in 2.4 times (from 865 to 364), the number of design organizations – in 13 times (from 495 to 38) [20].

Our country occupies still lower positions by such key indicator as the share of researchers in the structure of labour force, which is one of the main factors in the intellectual development of society. For instance, in 2000 Russia accounted for 78 scientific researchers per 10 000 people employed in the economy, in 2011 – for only 63. During this period, the indicator has increased in South Korea from 51 to 117 in Germany – from 65 to 81, in France – from 67 to 918. At that, we are falling behind not only the leaders of the world's science and technology development, but also behind such states like Slovenia and Estonia [20]. Therefore it is premature to speak about transition of the Russian economy to the innovation development model.

At the same time, the knowledge sector in the Russian Federation is funded on leftovers. Investments in the objects of intellectual property and R&D slightly exceed 1%. In some regions the situation is even more critical. For example, in the Vologda Oblast this sector accounts for 0.35% of all the investments, despite the fact that the 2005–2012 period witnessed an increase in the share of investments (*tab. 2*). With such level of investments, the knowledge sector cannot influence economic growth.

As a result, according to the Ministry of Economic Development, energy products account for almost 70% in the total volume of Russian export in value terms, including oil and oil products – over 53%, gas – over 12%.

Table 2. Investments in fixed capital in the knowledge sector in the total volume of investments in fixed capital, % [7, 8]

Territory	Sector	2005	2008	2010	2011	2012	Dynamics, p.p.
Russian Federation	Investments in the objects of intellectual property	0.8	0.5	0.4	0.5	0.5	-0.3
	Investments in R&D	0.3	0.3	0.4	0.4	0.6	+0.3
	Total	1.1	0.8	0.8	0.9	1.1	-
Vologda Oblast	Investments in the objects of intellectual property	0.03	0.05	0.04	0.0	0.3	+0.27
	Investments in R&D	0.0	0.0	0.04	0.0	0.05	+0.05
	Total	0.03	0.05	0.08	0.0	0.35	+0.32

Other exports items appear less significant: machines, equipment and vehicles – 4.2%; food, mainly grain – 2.2%, wood and pulp and paper products – 2.1%; other goods – 7.1%. Similar situation is observed in the Vologda Oblast, which has commodity orientation of export: ferrous metals and products of chemistry account for about 90% in the structure of its export. High-tech products export remains low. At that, the structure of import, in contrast, is dominated by high-tech goods. Retaining the commodity-oriented export model, the accelerated growth of machine building products imports in addition to the negative impact on economic dynamics creates a serious threat to the security of the country. In addition, “the habit of living off export earnings is still impeding innovation development” [13]. For comparison, the second largest economy in the world in terms of GDP – China, for which export is crucially important, exports mainly textiles and electronics. The basis of export in the U.S. is mechanical engineering. India, being a developing country, exports mainly transport equipment, clothing and medicines, and agricultural products.

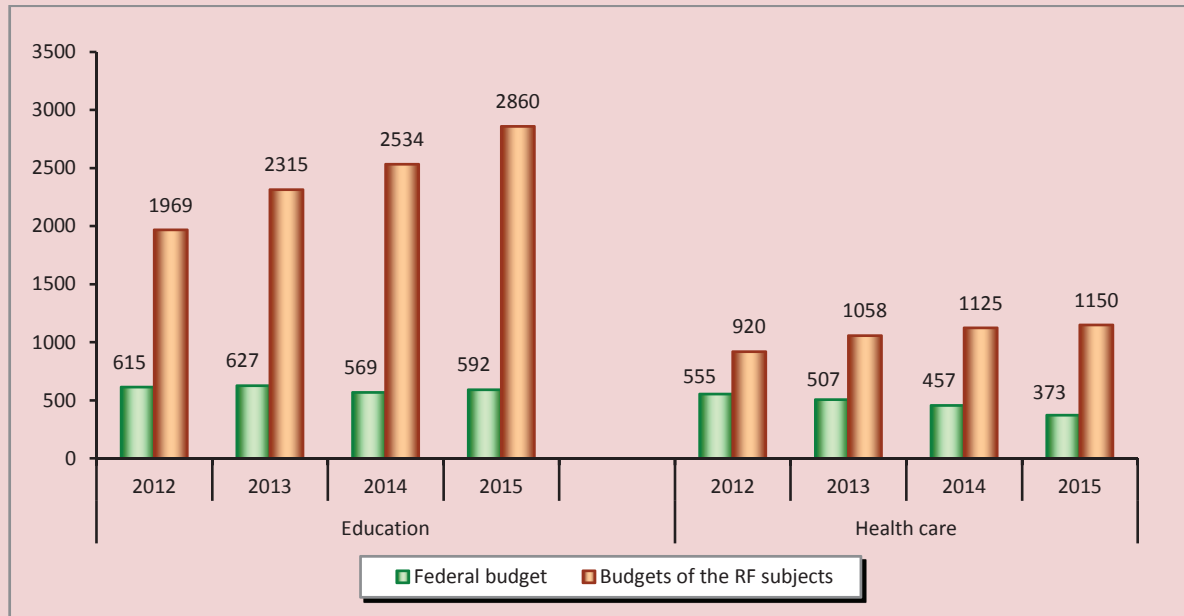
Lack of budgetary resources is the main problem. Very scarce resources are allocated for these purposes from the budgets of the federal subjects. The situation that is taking shape in the regions indicates the possibility of the budget crisis. In recent years, sub-federal budgets have been characterized by high debt burden, which from 2009 alone exceeds 20% of the amount of own revenues.

The main reason for the debt burden increase in the vast majority of RF subjects was the fall of income tax resulting in the deficit of territorial budgets. The decline in their own revenue base has made the RF subjects strictly dependent on external sources of funding. For instance, in the Vologda and Lipetsk oblasts (that specialize in metallurgy) in 2009–2012 in average the 25–33% implementation of expenditure obligations was provided through bank and budget loans and also through non-repayable financial aid from the federal budget. The situation is aggravated by the fact that the financing of social obligations is being transferred to the subjects of the Russian Federation to an increasing degree. This is evidenced by the forecast data on the expenditures on education and health care in the consolidated budget of the country for 2013–2015 (*fig. 10*).

In the following budgetary period the main share of budget funds will be directed also to the financing of the social sphere. In the Vologda Oblast it is about 70%. In the end, the volume of budget funds allocated to the development of the economy will continuously decrease: from 8.2 billion rubles in 2013 to 5.9 billion rubles in 2016 (*tab. 3*).

Russia’s fiscal policy does not contribute to the solution of the task of investing modernization of the economy. The system of state administration in this sphere requires significant revision. ISED T RAS studies show that the increase in tax collection and a series of unpopular measures, primarily in the sphere

Figure 10. Forecast expenditures of Russia's consolidated budget* on education and health care in 2012–2015 (billion rubles, in the prices of 2011)



* Note: Excluding the expenditures of state extra-budgetary funds.

Source: Accounts Chamber of the Russian Federation.

Table 3. Structure of the oblast budget expenditures in 2011–2016*

Sections	2011, fact		2012, fact		2013, estimation		2014, forecast		2015, forecast		2016, forecast	
	million rub.	%	million rub.	%	million rub.	%	million rub.	%	million rub.	%	million rub.	%
TOTAL expenditures	46519	100	45182	100	44756	100	44093	100	43857	100	46617	100
State issues	2053	4.4	1836	4.1	1995	4.5	2150	4.9	1865	4.3	1930	4.1
National security and law enforcement activity	2449	5.3	493	1.1	445	1.0	420	1.0	326	0.7	317	0.7
National economy	6698	14.4	8239	18.2	8202	18.3	6280	14.2	5720	13.0	5952	12.8
Housing and utilities sector**	1917	4.1	1848	4.1	393	0.9	1138	2.6	605	1.4	256	0.5
Environmental protection	236	0.5	164	0.4	145	0.3	185	0.4	149	0.3	146	0.3
Social sphere	27421	58.9	30013	66.4	27651	61.8	30869	70.0	31209	71.2	32866	70.5
education	7043	15.1	8285	18.3	10180	22.7	12382	28.1	12616	28.8	13238	28.4
culture, cinematography	882	1.9	594	1.3	504	1.1	477	1.1	506	1.2	594	1.3
health care	6643	14.3	10265	22.7	6598	14.7	7750	17.6	7726	17.6	8361	17.9
social policy	10870	23.4	10331	22.9	9924	22.2	9966	22.6	10177	23.2	10486	22.5
physical culture and sport	1764	3.8	431	1.0	289	0.6	118	0.3	117	0.3	130	0.3
mass media	219	0.5	107	0.2	156	0.3	176	0.4	68	0.2	56	0.1
Debt management	789	1.7	1310	2.9	1930	4.3	1919	4.4	1739	4.0	1697	3.6

Source: Draft Law of the Vologda Oblast "On the oblast budget for 2014 and the planned period of 2015 and 2016".

* For the purposes of comparability of the data, the expenditures for 2008–2010 are not presented here, since inter-budget transfers in this period were not included in the functional sections of the budget classification.

** In 2013–2016 the expenditures do not include non-repayable receipts.

of large business add 8–13 trillion rubles per year into the country's budgetary system [5, 6]. However, no practical steps have been made in this direction so far. Besides, at present, certain significant financial assets such as the reserve fund and the national welfare fund do not virtually participate in solving the priority tasks of socio-economic development.

As for economic entities, they hesitate to invest in the domestic economy. Innovation activity of enterprises remains extremely low, about 10% (their share is over 70% in developed countries) [9]. As a result, Russia's share in the global high-tech markets is less than 0.3%; it is by more than 2 orders less than that of the U.S., by an order less than that of Mexico, three times less than that of the Philippines [12]. According to expert estimates, production of high-tech consumer electronics, instrument making and machine-tool construction have turned out in a zone of "uncompensated technological inferiority" [21]. Rapid destruction of the contemporary technological mode means the destruction of the foundations of sustainable economic growth, the maintenance of backwardness of the Russian economy.

Russia's economy remains unattractive for foreign investors. For reference: the last year's volume amounted to 51 billion US dollars, the year of 2011 brought 55 billion US dollars to the economy, and 2008 – 75 billion US dollars [10]. Despite the fact that in the first half of 2013, their inflow in the Russian economy increased by 32.1% compared to the same period of last year (98.795 billion US dollars), Russia's investments abroad for the same period have increased in 1.8 times, reaching 126.4 billion US dollars. That is, the balance of investments remains negative: in the first half of 2013 –

27.6 billion US dollars. Therefore, in recent years, when Russia's regions require significant internal investments for the restructuring of the economy, substantial assets of Russian origin are being accumulated abroad [17]. In many respects it became possible after the 2006 withdrawal of restrictions on transborder movement of capital [4].

Thus, the issues of economy modernization, overcoming of technological backwardness on this basis, ensuring competitiveness and sustainability of economic growth require significant volume of investments, the level of which is currently insufficient. In this regard, it is crucial to create favorable investment climate, to reduce investment risks and thereby increase the investment attractiveness of the Russian economy.

It is possible to solve the urgent problems of the Russian Federation only when changing the principles of socio-economic policy at the federal level; when Russia abandons the destructive model of economic development based on raw materials and leading to financial bankruptcy and prolonged depression for the majority of the country's regions.

The situation that is taking shape, determines the need for significant adjustment of Russia's socio-economic policy, its focus on the priority development of the branches of the fifth and sixth technological modes, on expanding opportunities for investment in technological and engineering infrastructure, in human capital and knowledge. It concerns first and foremost the development of mass crediting of the real sector, primarily investment crediting. Only the implementation of the set of measures will make it possible to achieve sustainable economic growth and place the Russian Federation among the leading countries.

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