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# CONTENT

## FROM THE CHIEF EDITOR



## DEVELOPMENT STRATEGY



## BRANCH-WISE ECONOMY



## SOCIAL DEVELOPMENT

## SOCIAL FINANCES



## PROBLEMS OF MUNICIPAL ENTITIES



## INNOVATION DEVELOPMENT



## ENVIRONMENTAL ECONOMICS



## YOUNG RESEARCHERS

# FROM THE CHIEF EDITOR

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## New agenda and state management efficiency

Many experts compare the speech that the President of the Russian Federation V.V. Putin made at the plenary session of the Valdai International Club to his famous speech in Munich in 2007[1], in which he sharply criticized the doctrine of the unipolar world and called for the abandonment of double standards in international politics.

In 2012–2013 Russia successfully continues its foreign policy, stated by V.V. Putin at the Munich conference.

Presidential candidate V.V. Putin's election articles, embodied in the Decrees of the RF President dated May 7, 2012 set before the Russian society and the RF Government the major tasks of shifting to the new industrialization of Russia, they define specific objectives for enhancing Russia's security and competitiveness by 2020.

Speaking at the Valdai forum, a year and a half after the publication of his Decrees of May 2012, the President urges to discuss in-depth and internal problems, as Russia will not achieve the necessary strategic goals if these issues remain unsettled.

An expert described the President's speech at this forum as follows:

*"Vladimir Putin defined a new agenda for the society. Not for one week, not for one political season. For a long time. He started talking about the criteria of national identity, on the restoration of historical continuity of the country. The simplest questions occurred to be, strangely enough, the most important and unexpected ones: "Who are we?", "What do we want to be?"*[2].

[1] V.V. Putin's speech in Munich, February 10, 2007. Available at: http: //okoplanet.su/politik/41120

[2] Shchipkov A. Unlocking the tongue. On the possible consequences of President V. Putin's Valdai speech. Literaturnaya gazeta. 2013. No. 40. October 9. P. 9.

The President expressed the understanding of the fact that in the 21st century strategic security and competitiveness cannot be provided *"without spiritual, cultural and national self-determination. Without this we will not be able to withstand internal and external challenges, nor we will succeed in global competitions" and to achieve these goals it is necessary "to have military, technological and economic strength, but nevertheless the main thing that will determine success is the quality of citizens, the quality of society: their intellectual, spiritual and moral strength"* [3].

The President enumerated the reasons that have led to the current state of the Russian society: *"The consequences of the national catastrophes of the 20th century, when we experienced the collapse of our state two different times. The result was a devastating blow to our nation's cultural and spiritual codes; we were faced with the disruption of traditions and the consonance of history, with the demoralization of society, with a deficit of trust and responsibility. These are the root causes of many pressing problems we face"* [4].

*"After 1991 there was the illusion that a new national ideology, a development ideology, would simply appear by itself. The state, authorities, intellectual and political classes virtually rejected engaging in this work... In addition,* ***the lack of a national idea stemming from a national identity profited the quasi-colonial element of the elite – those determined to steal and remove capital, and who did not link their future to that of the country, the place where they earned their money"*** [5].

The President of Russia returns to the discussion of moral consensus in the Russian society. He has already addressed this issue in his election speeches. For instance, speaking at the congress of the Russian Union of Industrialists and Entrepreneurs (RUIE), V.V. Putin pointed out: *"...concerning what was going on in the 1990s. We spoke a lot on this issue, when doing business was often reduced to slicing the state pie"*;

***"...we should, of course, turn over this very page as well****... we have to end this period. Different options are proposed; it is necessary to discuss them with the society, with expert community, but it should be done in such a way that the society would really accept these proposals for solving the issues of the 1990s: unfair privatization, to speak plainly, and various auctions";*

*"...to ensure public legitimacy of the very institution of private property, public trust in business; otherwise we will not be able to develop a modern market economy and, what is more, we will not be able to create a healthy civil society****...the most important decisions must be taken in 2012 already"*** [6].

Apparently, the President believes that the time has come when it is necessary to reduce the influence of the part of the ruling elite that reached its present position by socially unjust ways, and does not link its future with the country.

V.V. Putin has to show the dissatisfaction with the pace of implementation of the reform strategy set out in the Decrees of May 7, 2012.

[3] Putin V.V. Speech at the session of the Valdai International Discussion Club on September 19, 2013. Available at: htpp://www.kremlin.ru/news/19243

[4] Ibidem.

[5] Ibidem.

[6] V.V. Putin's speech at the RUIE congress of on February 9, 2012. Official website of V.V. Putin. Available at: http://premier.gov.ru/events/news/18052/

This was clearly demonstrated at the session held by the RF President in Elista on April 16, 2013. The Head of State sharply criticized government officials for the lack of profes-sionalism in the implementation of the Decrees of May 2012 that contain his election pledges: *"How do we work? The quality of the work is pathetic, everything is done superficially. If we continue this way, we won't do a thing! But if we work persistently and competently, we will make it. Let's raise the quality of our work. It ought to be done! If we don't do it, it will have to be admitted that it is either me working inefficiently or it is you failing to do your job properly. Take notice that, judging by the current situation, I, personally, lean toward the latter. I think it's clear. No one should have any illusions"*[7].

Such unambiguous reaction of the President on the performance of Russia's executive power in the post-election period clearly shows the urgency of the situation and proves that the Head of State is highly worried for the future of those commitments he made in front of his voters. Those very obligations, the execution of which will determine the improvement of the quality of life, quality of the state, quality of civil society development and, ultimately, the competitiveness of the country.

V.V. Putin's speech at the Valdai Club reveals what the President considers to be the main reason of a low efficiency of modern public management in Russia: it is the lack of moral consensus in the society, and it should be achieved on the basis of historical creative synthesis of the best national experience.

[7] NEWSru.com. News of Russia. Wednesday, April 17, 2013.

The Accounts Chamber of the Russian Federation in its official report on the 2014–2016 draft federal budget[8] provides some evidence of the impact of the "quasi-colonial part of the elite" on the formation of Russia's budget for 2014–2016. Comparing this report with the report on the 2013–2015 draft federal budget, the researchers at the Institute of Socio-Economic Development of Territories of RAS came to the following conclusions.

**The Government ignored the repeated recommendations of the RF Accounts Chamber concerning the necessity of elaborating specific measures aimed at:**

– development of the earning power of Russia's budgetary system;

– reduction of the shadow sector of the economy;

– elimination of evasions from the payment of taxes and from other obligatory payments, including the use of transfer pricing and transactions through offshore zones;

– improvement of the control activities of tax and customs authorities;

– increase in the efficiency of tax control in terms of VAT refund from the federal budget;

– optimization of the existing system of privileges and preferences;

– reduction of tax and non-tax arrears;

– increase in the revenues from management and disposal of federal property;

– enhancement of the efficiency of state control in the sphere of regulation of production and turnover of alcohol and alcohol products;

[8] Official report of the Accounts Chamber of the Russian Federation on the draft federal law "On the federal budget for 2014 and the planned period of 2015 and 2016". Available at: htpp://www.ach.gov.ru

– adoption of measures to maintain a moderate debt burden both on the federal and regional budgets;

– timely influence on the debt policy of the corporate sector, and on the enhancement of the quality of debt sustainability forecasting.

It should be noted that many experts, analyzing the socio-economic and political situation in the Russian Federation in their publications, pointed out the inefficiency of decisions made by the Government, which under the influence of lobbyists from oligarchic structures makes decisions counter to the interests of the state budget[9].

One of the main messages contained in the President's speech consists in the necessity of creating the situation of political, economic and moral consensus in the country and in the Russian society. National values and public ethics, according to V.V. Putin, are a crucial stem of the power vertical, both political and economic, in the federal centre and the regions and municipalities. Only this approach can lead to the consolidation of the Russian society. But this requires radical changes in the socially unjust, immoral situation that has taken shape in Russia's society over the past decades.

[9] With regard to the measures proposed by authoritative experts, a calculation has been made, which shows a potential opportunity to increase the revenues of Russia's consolidated budget by 8.0–12.8 trillion rubles per year, or by 20–33%.

Calculation of the possible increase in the revenues of the Russian Federation budget system, trillion rubles per year

| Source | Actual value | Proposed option | RF consolidated budget | Budgets of extra-budgetary funds | Federal budget | Budgets of RF subjects |
|---|---|---|---|---|---|---|
| Abolition of VAT refunds to exporters of raw materials, introduction of differentiated rates of VAT refunds to exporters of semi-finished products | 18% | 0–6%*1) | 1.5 | | 1.5 | |
| Abolition of exemptions on VAT payment for the financial sector | 0% | 18%*2) | 3.0–5.0 | | 3.0–5.0 | |
| Abolition of privileges on property tax for subjects of natural monopolies | 0% | 2.2%*2) | 0.2 | | | 0.2 |
| Increase in the dividend tax rate | 5–9% | 13–15%*1) | 0.2–0.5 | | | 0.2–0.5 |
| Introduction of the progressive scale of income tax | 13%** | 13–50%*3) | 2.0–4.5 | | | 2.0–4.5 |
| Introduction of tax on the export of currency | – | 20%*4) | 0.5 | | 0.5 | |
| Abolition of the limit value of annual income, above which insurance premiums are not taken | 568 thousand rubles | 0*5) | 0.6 | 0.6 | | |
| Total | | | 8.0–12.8 | 0.6 | 5.0–7.0 | 2.4–5.2 |

*1) Doctor of Economics N.A. Krichevskiy (full abolition), ISEDT RAS (abolition for exporters of raw materials, introduction of differentiated rates).
*2) ISEDT RAS.
*3) RAS Academician R.I. Nigmatulin, Doctor of Economics V.L. Inozemtsev, Doctor of Economics N.A. Krichevskiy, A.V. Bagryakov, political parties "Just Russia", KPRF.
*4) Party "Just Russia", Chairman of the Tax Consultants Chamber D. Chernik.
*5) Doctor of Economics V.L. Inozemtsev, Economic Expert Group.

63.6% of the electorate voted for V.V. Putin at the Presidential elections on March 6, 2012. Undoubtedly, the overwhelming majority of Russia's citizens will support the implementatin of the ideas set forth by the RF President at the Valdai International Club, the ideas that are associated with the rule of national values and social ethics in the life of all the population groups. Examples of real actions in addressing these issues **should be provided by the vertical of power in its purification from "the quasi-colonial element of the elite – those determined to steal and remove capital, and who did not link their future to that of the country, the place where they earned their money"**[10].

[10] Putin V.V. Speech at the session of the Valdai International Discussion Club on September 19, 2013. Available at: htpp://www.kremlin.ru/news/19243

# Public opinion monitoring of the state of the Russian society

As in the previous issues, we publish the results of the public opinion monitoring of the state of the Russian society conducted by ISEDT RAS in the Vologda Oblast[1].

The following tables show the dynamics of a number of parameters indicating the social feeling and socio-political sentiment of the Vologda Oblast population on average for the last 6 surveys (December 2012 – October 2013) in comparison with the data for 2012, as well as for 2011, when D.A. Medvedev's presidential term was due to expire, and for 2007, the last year of V.V. Putin's second Presidency.

The survey results show that in 2012–2013 the evaluation of the performance of Russia's President and the Vologda Oblast Governor is becoming more positive, although the pace of positive changes is insignificant. The situation remains less favourable than it was in 2011 and 2007. There still exist certain negative trends in the public opinion concerning the performance of the RF Government.

Along with the lack of positive changes in the assessment of the authorities' performance, a steady growth in social mood and stock of patience, and a reduction in the level of protest potential is observed in all the social groups. This dynamics indicates that the people tend to pin their expectations and hopes on the activities of the authorities to a lesser extent now. They concentrate more on their personal, family and private life; that is an alarming trend, because it increases the disconnection between the state and society.

## Estimation of performance of the authorities

On average for the past 6 surveys in comparison with 2012, the assessments of the performance of Russia's President and the Vologda Oblast Governor have somewhat improved (the share of positive evaluations has increased by 3% and 2% accordingly).

At the same time, from February 2013 the level of approval of the President's performance has not been increasing, it remains at about 55%, which is lower by 20 percentage points than it was at the end of V. Putin's second Presidency in 2007 (75%). The share of negative estimations has increased almost by the same amount (by 20 percentage points – from 11% up to 30%) on average for the past 6 surveys in comparison with 2007.

[1] The polls are held six times a year in Vologda, Cherepovets, and in eight districts of the oblast (Babayevsky District, Velikoustyugsky District, Vozhegodsky District, Gryazovetsky District, Kirillovsky District, Nikolsky District, Tarnogsky District and Sheksninsky District). The method of the survey is a questionnaire poll by place of residence of respondents. The volume of a sample population is 1500 people aged from 18 and older. The sample is purposeful and quoted. Representativeness of the sample is ensured by the observance of the proportions between the urban and rural population, the proportions between the inhabitants of settlements of various types (rural communities, small and medium-sized cities), age and sex structure of the oblast's adult population. Sampling error does not exceed 3%.

More details on the results of ISEDT RAS polls are available at http://www.vscc.ac.ru/.

Table 1. Dynamics of the answers to the question: "How do you assess the current performance of..?", as a percentage of the number of respondents

| Indicator | 2007 | 2011 | 2012 | Oct. 2013 | Average for the last 6 surveys (December 2012 – October 2013) | Dynamics (+/-), the last 6 surveys in comparison with... | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 2012 | 2011 | 2007 |
| **RF President** | | | | | | | | |
| Approve | 75.3 | 58.7 | 51.7 | 54.3 | 54.7 | +3 | -4 | -21 |
| Do not approve | 11.5 | 25.6 | 32.6 | 28.7 | 30.4 | -2 | +5 | +19 |
| **Chairman of the RF Government *** | | | | | | | | |
| Approve | - | 59.3 | 49.6 | 49.0 | 48.4 | -1 | -11 | - |
| Do not approve | - | 24.7 | 33.3 | 30.6 | 33.4 | 0 | +9 | - |
| **Governor** | | | | | | | | |
| Approve | 55.8 | 45.7 | 41.9 | 45.9 | 44.2 | +2 | -2 | -12 |
| Do not approve | 22.2 | 30.5 | 33.3 | 32.4 | 33.3 | 0 | +3 | +11 |
| * included into the survey since 2008. | | | | | | | | |

## Assessment of the RF President's performance by different social groups

A slight improvement in the assessments of the President's activity for the last 6 surveys compared with the 2012 is observed in all socio-demographic groups of the population (by 1–5 percentage points). However, in all the groups, the situation remains considerably more negative than it was at the end of V. Putin's second Presidency (the level of approval of the RF President decreased by 19–24 percentage points).

Table 2. Dynamics of the RF President's activity approval by different social groups of population, as a percentage of the number of respondents

| Groups of population | 2007 | 2011 | 2012 | Oct. 2013 | Average for the last 6 surveys (December 2012 – October 2013) | Dynamics (+/-), the last 6 surveys in comparison with… | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 2012 | 2011 | 2007 |
| **Sex** | | | | | | | | |
| Men | 73.6 | 55.6 | 48.9 | 48.1 | 51.9 | +3 | -4 | -22 |
| Women | 76.7 | 61.2 | 53.9 | 59.3 | 56.9 | +3 | -4 | -20 |
| **Age** | | | | | | | | |
| Under 30 | 76.6 | 58.3 | 49.7 | 53.4 | 52.5 | +3 | -6 | -24 |
| 30–55 | 75.1 | 57.6 | 50.9 | 54.1 | 55.0 | +4 | -3 | -20 |
| Over 55 | 74.6 | 60.7 | 54.6 | 55.1 | 56.0 | +1 | -5 | -19 |
| **Education** | | | | | | | | |
| Incomplete secondary, secondary | 70.3 | 54.9 | 46.0 | 47.5 | 49.4 | +3 | -6 | -21 |
| Secondary vocational | 76.4 | 59.8 | 51.8 | 54.3 | 55.3 | +4 | -5 | -21 |
| Incomplete higher, higher | 80.1 | 61.3 | 56.6 | 61.4 | 59.3 | +3 | -2 | -21 |
| **Income groups** | | | | | | | | |
| 20% of the poorest people | 65.1 | 45.7 | 40.9 | 50.7 | 45.2 | +4 | -1 | -20 |
| 60% of the people with middle-sized income | 78.0 | 60.4 | 53.8 | 54.4 | 55.9 | +2 | -5 | -22 |
| 20% of the most prosperous people | 82.6 | 68.9 | 59.4 | 60.8 | 63.9 | +5 | -5 | -19 |
| **Territories** | | | | | | | | |
| Vologda | 74.1 | 58.3 | 51.6 | 52.7 | 52.9 | +1 | -5 | -21 |
| Cherepovets | 82.8 | 68.5 | 62.3 | 63.8 | 63.4 | +1 | -5 | -19 |
| Districts | 72.2 | 53.9 | 46.3 | 49.8 | 50.9 | +5 | -3 | -21 |

## Assessment of the RF President's performance in coping with challenging issues

Some "critical points" in the public opinion can be noted using the index method, the essence of which consists in identifying the correlation between positive and negative moods in the society[2].

In 2007 the level of positive assessments of the President's performance in solving the key problems of the country was significantly higher than the level of negative assessments. During D. Medvedev's Presidency an opposite situation was observed: the share of negative opinions prevailed over positive assessments for most of the points.

On average for the past 6 surveys the prevalence of negative characteristics remains; however, public opinion has somewhat improved compared to 2012. And this is reflected in the assessments of almost all the social groups.

Table 3. Assessment of the RF President's success in dealing with **the issue of strengthening Russia's international standing** (index in social groups, in points)

| Groups of population | 2007 | 2011 | 2012 | Oct. 2013 | Average for the last 6 surveys (December 2012 – October 2013) | Dynamics (+/-), the last 6 surveys in comparison with… | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 2012 | 2011 | 2007 |
| **Sex** | | | | | | | | |
| Men | 131.9 | 109.1 | 101.2 | 106.7 | 104.2 | +3 | -5 | -28 |
| Women | 134.8 | 115.1 | 108.4 | 119.9 | 111.8 | +3 | -3 | -23 |
| **Age** | | | | | | | | |
| Under 30 | 138.5 | 113.6 | 108.6 | 118.4 | 109.7 | +1 | -4 | -29 |
| 30–55 | 133.6 | 112.6 | 105.6 | 112.1 | 110.3 | +5 | -2 | -23 |
| Over 55 | 128.8 | 111.3 | 101.8 | 113.4 | 104.4 | +3 | -7 | -24 |
| **Education** | | | | | | | | |
| Secondary and incomplete secondary | 123.6 | 106.0 | 97.5 | 110.1 | 102.3 | +5 | -4 | -21 |
| Secondary vocational | 131.8 | 112.8 | 103.8 | 113.1 | 107.8 | +4 | -5 | -24 |
| Higher and incomplete higher | 147.7 | 118.6 | 113.3 | 118.7 | 114.8 | +2 | -4 | -33 |
| **Income groups** | | | | | | | | |
| 20% of the poorest people | 103.4 | 83.9 | 80.9 | 95.5 | 84.8 | +4 | +1 | -19 |
| 60% of the people with middle-sized income | 137.7 | 117.2 | 109.6 | 117.9 | 113.4 | +4 | -4 | -24 |
| 20% of the most prosperous people | 155.2 | 128.7 | 122.2 | 128.7 | 122.0 | 0 | -7 | -33 |
| **Territories** | | | | | | | | |
| Vologda | 130.6 | 114.0 | 99.6 | 116.6 | 106.1 | +6 | -8 | -25 |
| Cherepovets | 158.2 | 131.4 | 121.5 | 117.3 | 114.2 | -7 | -17 | -44 |
| Districts | 122.6 | 102.2 | 99.6 | 110.6 | 106.5 | +7 | +4 | -16 |
| Oblast | 133.5 | 112.5 | 105.2 | 114.0 | 108.4 | +3 | -4 | -25 |

[2] Russian Public Opinion Research Center database: social wellbeing indices. Available at: http://wciom.ru/178/. For calculating each index the share of negative answers is subtracted from the share of positive answers, after that 100 is added to the obtained figure in order to avoid negative values. Consequently, fully negative answers would give the total index 0, fully positive answers – index 200, the balance between the former and the latter – index 100, which is, in fact, a neutral mark. The index of social strain has a reversed order of values: 0 points is an absolutely positive value, 200 points – an absolutely negative value.

On average for the past 6 surveys in comparison with 2012 and 2011 the share of the oblast residents who believe that the President successfully handles the issue of restoring order in the country has slightly increased. Stable positive changes are observed in most socio-demographic groups of the population, especially among the population of the districts (the index of success has increased by 8–9 points). Negative trends are observed only in the group of the 20% of the poorest people (the index is lower by 1 point in comparison with 2012 and 2011 and by 29 points in comparison with 2007), and also among the Vologda residents (index is lower by 13 points in comparison with 2011 and by 35 points in comparison with 2007).

Table 4. Assessment of the RF President's success in dealing with **the issue of imposing order in the country** (index in social groups, in points)

| Groups of population | 2007 | 2011 | 2012 | Oct. 2013 | Average for the last 6 surveys (December 2012 – October 2013) | Dynamics (+/-), the last 6 surveys in comparison with… | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 2012 | 2011 | 2007 |
| **Sex** | | | | | | | | |
| Men | 118.6 | 84.4 | 82.1 | 88.3 | 86.8 | +5 | +2 | -32 |
| Women | 119.5 | 89.9 | 86.7 | 100.5 | 92.2 | +6 | +2 | -27 |
| **Age** | | | | | | | | |
| Under 30 | 129.1 | 91.7 | 87.8 | 99.7 | 91.7 | +4 | 0 | -37 |
| 30-55 | 119.4 | 85.1 | 83.9 | 90.9 | 89.0 | +5 | +4 | -30 |
| Over 55 | 109.7 | 87.7 | 83.3 | 97.7 | 89.5 | +6 | +2 | -20 |
| **Education** | | | | | | | | |
| Secondary and incomplete secondary | 111.9 | 81.3 | 78.8 | 91.6 | 85.8 | +7 | +5 | -26 |
| Secondary vocational | 118.6 | 90.2 | 85.6 | 97.9 | 90.8 | +5 | +1 | -28 |
| Higher and incomplete higher | 128.5 | 90.8 | 88.9 | 95.6 | 92.9 | +4 | +2 | -36 |
| **Income groups** | | | | | | | | |
| 20% of the poorest people | 98.6 | 70.8 | 70.3 | 75.3 | 69.4 | -1 | -1 | -29 |
| 60% of the people with middle-sized income | 121.6 | 91.1 | 86.7 | 96.9 | 93.2 | +7 | +2 | -28 |
| 20% of the most prosperous people | 136.7 | 92.9 | 98.3 | 114.2 | 102.3 | +4 | +9 | -34 |
| **Territories** | | | | | | | | |
| Vologda | 118.5 | 96.1 | 82.8 | 90.3 | 83.2 | 0 | -13 | -35 |
| Cherepovets | 136.8 | 94.1 | 94.2 | 106.5 | 97.6 | +3 | +3 | -39 |
| Districts | 110.6 | 80.0 | 80.7 | 91.1 | 89.0 | +8 | +9 | -22 |
| Oblast | 119.1 | 87.4 | 84.7 | 95.0 | 89.8 | +5 | +2 | -29 |

Less positive assessments among the oblast population can be observed with regard to the President's performance in coping with the issues of protecting democracy and strengthening the freedoms of citizens. On average for the past 6 surveys, the increase in the index of success in most socio-demographic groups is indicated only by comparison with 2012, especially among people with secondary and incomplete secondary education, and also the residents of the districts (the index is higher by 8 and 11 points, respectively).

Negative trends remain in the assessments of persons with secondary vocational education, the residents of Vologda and Cherepovets. The index of success on average for the past 6 surveys has decreased in these groups by 1–7 points in comparison with 2012, by 9–17 points in comparison with 2011 and by 24–43 points in comparison with 2007.

In comparison with 2011 and especially to 2007, the deterioration of the index values is observed for the majority of the population groups.

Table 5. Assessment of the RF President's success in dealing with **the issue of protecting democracy and strengthening the citizens' freedoms** (index in social groups, in points)

| Groups of population | 2007 | 2011 | 2012 | Oct. 2013 | Average for the last 6 surveys (December 2012 – October 2013) | Dynamics (+/-), the last 6 surveys in comparison with… | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 2012 | 2011 | 2007 |
| **Sex** | | | | | | | | |
| Men | 107.0 | 80.9 | 72.8 | 77.0 | 76.8 | +4 | -4 | -30 |
| Women | 107.7 | 87.4 | 79.4 | 87.1 | 81.8 | +2 | -6 | -26 |
| **Age** | | | | | | | | |
| Under 30 | 115.0 | 84.7 | 79.0 | 82.8 | 79.5 | +1 | -5 | -35 |
| 30-55 | 106.3 | 81.9 | 74.6 | 78.2 | 79.7 | +5 | -2 | -27 |
| Over 55 | 102.4 | 88.6 | 77.4 | 88.9 | 79.4 | +2 | -9 | -23 |
| **Education** | | | | | | | | |
| Secondary and incomplete secondary | 100.4 | 78.1 | 69.5 | 80.8 | 77.5 | +8 | -1 | -23 |
| Secondary vocational | 109.0 | 87.0 | 78.8 | 82.5 | 78.2 | -1 | -9 | -31 |
| Higher and incomplete higher | 113.9 | 88.3 | 80.3 | 84.7 | 83.1 | +3 | -5 | -31 |
| **Income groups** | | | | | | | | |
| 20% of the poorest people | 94.3 | 62.6 | 61.9 | 73.5 | 67.3 | +5 | +5 | -27 |
| 60% of the people with middle-sized income | 108.7 | 89.0 | 78.2 | 80.8 | 80.3 | +2 | -9 | -28 |
| 20% of the most prosperous people | 122.3 | 93.8 | 87.3 | 97.1 | 86.8 | 0 | -7 | -35 |
| **Territories** | | | | | | | | |
| Vologda | 98.6 | 91.3 | 76.8 | 76.9 | 74.8 | -2 | -17 | -24 |
| Cherepovets | 122.0 | 91.8 | 85.9 | 85.4 | 79.2 | -7 | -13 | -43 |
| Districts | 104.3 | 77.6 | 71.6 | 84.1 | 82.3 | +11 | +5 | -22 |
| Oblast | 107.4 | 84.5 | 76.5 | 82.6 | 79.6 | +3 | -5 | -28 |

In December 2012 – October 2013 in comparison with 2012, the opinion of the districts' residents about the President's activities aimed at recovery of the economy and improvement of citizens's welfare improved significantly (the index increased by 9 points). At the same time, the trends in the assessments of the Vologda and Cherepovets residents remain negative (the index dropped by 34 and 53 points, respectively on average for the past 6 surveys in comparison with 2007). Public opinion in the age group over 55 years old is not improwing as well (like in 2012, the index was 74 points, in 2007 – 98 points).

In general, compared to 2012, the index of success in the majority of socio-demographic groups increased by 1–6 points, which is insignificant if we compare the data for the last 6 surveys with the period, when V. Putin's second term in office was due to expire (2007). During this time, the index of the President's success in coping with such a vital issue as the growth of citizens' welfare, has considerably decreased in all the population groups (by 25–45 points).

Table 6. Assessment of the RF President's success in dealing with **the issue of economic recovery and increase in the citizens' welfare** (index in social groups, in points)

| Groups of population | 2007 | 2011 | 2012 | Oct. 2013 | Average for the last 6 surveys (December 2012 – October 2013) | Dynamics (+/-), the last 6 surveys in comparison with… | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 2012 | 2011 | 2007 |
| **Sex** | | | | | | | | |
| Men | 106.6 | 73.0 | 67.5 | 72.9 | 73.4 | +6 | 0 | -33 |
| Women | 109.5 | 76.5 | 72.9 | 75.2 | 74.4 | +1 | -2 | -35 |
| **Age** | | | | | | | | |
| Under 30 | 117.9 | 77.3 | 69.1 | 82.2 | 74.1 | +5 | -3 | -44 |
| 30-55 | 109.2 | 71.5 | 69.1 | 72.3 | 74.0 | +5 | +3 | -35 |
| Over 55 | 97.8 | 78.4 | 74.0 | 71.3 | 73.7 | 0 | -5 | -24 |
| **Education** | | | | | | | | |
| Secondary and incomplete secondary | 102.2 | 72.1 | 68.8 | 63.0 | 71.6 | +3 | -1 | -31 |
| Secondary vocational | 108.8 | 76.3 | 71.1 | 78.4 | 73.4 | +2 | -3 | -35 |
| Higher and incomplete higher | 114.8 | 76.5 | 71.1 | 82.1 | 77.0 | +6 | 0 | -38 |
| **Income groups** | | | | | | | | |
| 20% of the poorest people | 99.0 | 58.0 | 57.5 | 58.6 | 59.9 | +2 | +2 | -39 |
| 60% of the people with middle-sized income | 106.5 | 77.4 | 72.9 | 73.3 | 74.4 | +1 | -3 | -32 |
| 20% of the most prosperous people | 129.8 | 83.8 | 81.0 | 91.8 | 85.2 | +4 | +1 | -45 |
| **Territories** | | | | | | | | |
| Vologda | 99.3 | 77.9 | 67.5 | 69.1 | 65.7 | -2 | -12 | -34 |
| Cherepovets | 124.3 | 79.0 | 72.3 | 77.9 | 70.8 | -1 | -8 | -53 |
| Districts | 104.3 | 71.5 | 71.0 | 74.9 | 79.8 | +9 | +8 | -25 |
| Oblast | 108.2 | 74.9 | 70.5 | 74.2 | 74.0 | +3 | -1 | -34 |

## Estimation of social condition

The share of positive assessments of social mood and stock of patience continues to grow, despite more negative opinions concerning the activity of the Head of State on average for the past 6 surveys in comparison with 2007, as well as the increase in the share of the oblast population, who consider themselves "poor" and "extremely poor".

Table 7. Estimation of social condition (as a percentage of the number of respondents)

| Answer options | 2007 | 2011 | 2012 | Oct. 2013 | Average for the last 6 surveys (December 2012 – October 2013) | Dynamics (+/-), the last 6 surveys in comparison with… | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 2012 | 2011 | 2007 |
| **Mood** | | | | | | | | |
| Usual condition, good mood | 63.6 | 63.1 | 67.3 | 71.5 | 68.3 | +1 | +5 | +5 |
| Feeling stress, anger, fear, depression | 27.8 | 28.9 | 27.0 | 24.0 | 26.5 | -1 | -2 | -1 |
| **Stock of patience** | | | | | | | | |
| Everything is not so bad; it's difficult to live, but it's possible to stand it | 74.1 | 74.8 | 76.6 | 81.6 | 78.7 | +2 | +4 | +5 |
| It's impossible to bear such plight | 13.6 | 15.3 | 15.8 | 12.3 | 14.5 | -1 | -1 | +1 |
| **Social self-identification** | | | | | | | | |
| The share of people who consider themselves to have average income | 48.2 | 43.1 | 44.7 | 45.7 | 43.8 | -1 | +1 | -4 |
| The share of people who consider themselves to be poor and extremely poor | 42.4 | 44.3 | 44.5 | 45.4 | 46.9 | +2 | +3 | +5 |
| **Consumer Sentiment Index** | | | | | | | | |
| Index value, points | 105.9 | 89.6 | 91.5 | 90.4 | 90.9 | -1 | +1 | -1 |

## Attitude of the population toward political parties

The dynamics of support to the party of power shows no positive changes. As in 2007 and in 2011, on average for the past 6 surveys, the level of support was 29–30%. At that, there has been a continuous increase in the share of the oblast residents, who consider that no political party among currently existing ones expresses their interests (in 2007 – 18%, in 2011 – 29%, in 2012 – 31%, on average for the last 6 surveys – 35%).

Table 8. Dynamics of the answers to the question: "Which party expresses your interests?", as a percentage of the number of respondents

| Party | 2007 | Election to the RF State Duma 2007, fact | 2011 | Election to the RF State Duma 2011, fact | 2012 | Oct. 2013 | Average for the last 6 surveys (December 2012 – October 2013) | Dynamics (+/-), the last 6 surveys in comparison with… | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2012 | 2011 | 2007 |
| United Russia | 30.2 | 60.5 | 31.1 | 33.4 | 29.1 | 26.9 | 29.5 | 0 | -2 | -1 |
| KPRF | 7.0 | 9.3 | 10.3 | 16.8 | 10.6 | 11.9 | 11.4 | +1 | +1 | +4 |
| LDPR | 7.5 | 11.0 | 7.8 | 15.4 | 7.8 | 8.4 | 7.1 | -1 | -1 | 0 |
| Just Russia | 7.8 | 8.8 | 5.6 | 27.2 | 6.6 | 4.0 | 4.8 | -2 | -1 | -3 |
| Other | 1.8 | – | 1.9 | – | 2.1 | 1.0 | 2.8 | +1 | +1 | +1 |
| No party | 17.8 | – | 29.4 | – | 31.3 | 37.3 | 34.6 | +3 | +5 | +17 |
| It is difficult to answer | 21.2 | – | 13.2 | – | 11.7 | 10.5 | 9.9 | -2 | -3 | -11 |

*From the Editorial Board.* The following interview with Ye.S. Savchenko has been reprinted from the Russian Economic Journal (Rossiyskiy Ekonomicheskiy Zhurnal) (2013. No.4. P. 40-45).

Ye.S. Savchenko worked as a collective farm agronomist, then he was appointed Director of a state farm; he also worked in the district and regional party bodies, in the CPSU Central Committee and the RSFSR Ministry of Agriculture. Since 1993 he has been the Head of Administration, and then the Governor of the Belgorod Oblast. He was re-elected as the Oblast Governor in October 2012. He is a Professor and has a Doctor of Economics degree.

Ye.S. Savchenko writes in his blog: "Life has proved that our estimations and actions are right. The landmarks in the region's economy, which we have chosen, proved to be right as well. Having focused on the production of meat and milk in agriculture, on individual housing construction in the construction industry, on the modernization of mining and metallurgical industry and boosting small business, we have laid the foundations, which helps overcome difficulties and develop our country... At present, we have managed to implement many programmes aimed at improving the quality of life of our fellow citizens... But I think that our main priority is the creation of such spiritual and moral environment in society that raises the quality of human relations to a new level" (quoted from: http//www/savchenko.ru/info).

**Savchenko Ye.S.**

# On the necessity and content of the change in macroeconomic policy

For more details on the results of the socio-economic development of the Belgorod Oblast over the recent years see the above article from the Chief Editor of our journal.

*The facts indicate that the urgency of such a change is openly declared even by certain representatives of the "power vertical" (moreover, they propose the actual options for this change in keeping with the recommendations appeared in our journal as well) that has for 13 years pursued a socio-economic course, which, under the conditions of maintaining high world oil prices reduced Russia's economy to a condition, argued to be "still a stagnation or already a recession?"* Considerations of this sort are expressed in the media and scientific*

* The main features of this condition and the substantiation of proposals on its alteration can be found in the following publications of the Russian Economic Journal in the current year: Yershov M., Tatuzov V., Uryeva Ye. Guidelines for innovation development: "memories of the future"? (Macroeconomic dynamics–2013 denies the pre-crisis forecasts). 2013. No. 2; Zhukovskiy V. Oil and gas Titanic at the end of the first year of the "new-old" political cycle (commentary to the official macroeconomic statistics). Ibid.; Glazyev S. Once more on the alternative system of measures of the state policy for the modernization and development of domestic economy (proposals for 2013–2014). 2013. No. 3.

*journal publications, in particular, by* ***Yevgeniy Stepanovich Savchenko****, the Corresponding Member of the Russian Academy of Agricultural Sciences**, the Governor of the Belgorod Oblast, the territory famous for its achievements in agriculture and animal husbandry (its profile economic specialization). These considerations are expressed in the following interview.*

**– How would you evaluate the current situation in Russia's economy?**

– It is a known fact that the country has developed a classic raw material (neocolonial) type of economy, main features of which are: the growing export of raw materials – oil, gas, iron ore, coal, wood, grain, fish; the loss of competitiveness; the dominance of imported goods and services in the domestic consumer market; the violation of the balance of interests and the growth of contradictions between national producers and consumers (at that, consumers' interests dominate).

A relative economic stability of the recent years is explained by an exceptionally favorable situation for export goods and raw materials; though it is no longer preventing the actual stagnation of economic growth. Moreover, our accession to the World Trade Organization legally secures Russia's status-quo as a source of raw materials in the global economy.

Thus, the state of national economy is determined largely by the influence of external factors. Their slightest changes, in whatever region of the world they may occur, have an impact on Russia, and not only on its economic situation, but also on the social sphere and internal policy.

**– In your opinion, what are the main reasons for such a poor condition of Russia's economy? Is it possible, without repeating the well-known stories concerning the "turbulent 1990s", just to stay in the given aspect within the limits of the post-default period that covers the years of the second, third and the beginning of the fourth ("new old") post-Soviet political cycles?**

– I think that these reasons are connected with the wrong macroeconomic policy pursued since the turn of the century. The famous post-default economic growth in Russia was determined by the then sharp rise in world prices for hydrocarbon energy as our main export commodity, and, moreover, in the first years after the 1998 events, by the post-devaluation effect to a greater extent. Import price hikes made our manufacturers competitive, especially in the domestic market, which gave an impetus to the development of the non-resource sector of the economy, the import substitution processes, in particular, in the consumer goods industry and food production. Unfortunately, Russia completely lost this advantage afterwards, and the so-called economic stability is maintained only at the expense of high export prices for oil and gas.

The mechanism of this loss for over ten years has been largely associated with the paradox consisting in the fact that domestic inflation in this period had been continuously strengthening the ruble exchange rate. Since the average annual inflation over the past 13 years has amounted to approximately 12%, it is easy to calculate that it has reached 400% in total for the specified period. But since the official rate of US dollar in 2000 and 2013 remained unchanged and was approximately 30 rubles, this has led to the fourfold increase in the cost of production of one and the same product (while the technology remained essentially unchanged) not only in rubles, but also in US dollars.

This means only one thing: the competitiveness of Russia's economy has decreased in four times over 13 years in relation to the world economy (except for a little minus associated with the US dollar inflation).

** See, for example: Savchenko Ye. Russia's macroeconomic policy: problems and solutions. APK: ekonomika i upravleniye. 2013. No. 6.

For instance, in 2000 the costs for production of a conventional unit of output in Russia in hard currency were 1.5–2 times lower that those in Western countries; in the beginning of 2013, however, they increased by the same rate. The outcome is clear: over this historical period Russia's economy has shifted from a sustainable competitiveness to its complete loss.

I will not dwell on the motives for the adoption of respective macroeconomic decisions in the period of "fat petrodollar years", though it is obvious: the persons responsible for their adoption, strived above all to bring domestic prices for goods and services of natural monopolies in line with the world prices, to ensure Russia's accession to the WTO and facilitate the "general integration of the country into the global economy", at the same time improving the condition of banks and corporations that have accumulated huge external currency liabilities. The fact remains that Russian economy is now in a macroeconomic deadlock; certain stability rests only on the shaky foundations of trends in world prices for Russia's export commodities, primarily oil and gas. It seems necessary to substantiate this fact with several informational and analytical statements.

Firstly, due to inflation at the constant exchange rate, Russia's economy "gained more weight" not only in rubles, but also in dollars. Its dollar capacity over these years has increased in at least eight times, including that in connection with inflation – in four times, and in connection with actual growth – in two times. Under the conditions of an almost tenfold rise in hydrocarbons prices, the country has become a vessel for the bundling of US dollars, the annual emission of which has recently exceeded one trillion. This circumstance was a powerful factor in maintaining the stability of the global financial system, but Russia has paid for this by losing competitiveness of its national economy.

Secondly, if the actual value of the ruble in terms of dollar (exchange rate) in the period under consideration had been the same as in 2000, then our country would have additionally received about 200 trillion rubles with regard to export alone; this figure is almost equal to three annual GDP or ten consolidated budgets of Russia. In other words, due to the ruble appreciation, our country has been working for the benefit of a foreign economy for three out of thirteen years.

Thirdly, although an ordinary buyer is known to be the main investor of any economy, three-quarters of Russia's retail turnover, due to the revaluation of the ruble, is currently formed on the basis of imported goods, that makes over 10 trillion rubles (or more than 300 billion US dollars), which are annually withdrawn from the country to support foreign manufacturers. We should also point out the capital outflow of around 100 billion US dollars a year. This is another component of the price that we pay for the excessive appreciation of ruble.

Fourthly, all these years, Russian banks granted credits to our economy under 12–18% per annum, explaining such a high interest rate by the level of inflation. The Bank of Russia gave similar explanations in respect of an over-the-top refinancing rate. At the same time, the bankers of different levels did not highlight an important fact, to put it mildly, that under the conditions of the constant exchange rate of the ruble, the ruble interest rate remains identical to that of the dollar. Therefore, for 13 years our commercial banks have loaned money to legal and natural persons under the terms three-five times more tight than those of Western banks. As for the Central Bank's refinancing rate, it was actually dozens of times higher than the price of money, established by similar global financial regulators. Yet it is not clear why in such circumstances the Bank of Russia placed the country's gold and foreign currency reserves abroad under 1–2% per annum?

After all, over these years, it would have been possible to earn not less than a trillion US dollars by crediting our financial system at least under 8–10% per annum in rubles at the constant exchange rate of the national currency. As a result, the profitability of the country's banking system for the past years has increased both in rubles and in foreign currency almost by a factor of ten; but the other side of the coin has been the increase in production costs, rise in the prices for goods and services, and most importantly, the loss of competitiveness. Thus, freezing the exchange rate of ruble has launched a powerful "finance-pumping" mechanism concerning the facilitation of not only the outflow of capital abroad, but also the transfer of capital from the real sector to the financial sector.

Fifthly, it seems appropriate to refer in this regard to the experience of other countries with a much more flexible macroeconomic policy. Take, for example, China, which has created the world's second largest economy with a powerful export potential over a short period of time. One can name quite a few reasons for the "Chinese economic miracle", but one of its fundamental factors was the devaluation of the national currency at the end of the previous century – from 0.40 to 0.12 US dollars for the yuan, i.e. in 3.3 times. And only recently, under the powerful pressure of the United States, China has slightly appreciated its currency up to 16 cents per yuan.

Similar behavior was once demonstrated by Japan, which in the conditions of the advantageous exchange rate of the yen has achieved the "economic miracle". Only after a long "arm twisting" did the U.S. succeed in getting Japan to sign the Plaza Accord in 1985, which resulted in an almost twofold revaluation of the yen exchange rate. A quarter century later, the Japanese are forced to devalue the national currency once again in order to take the country out of prolonged economic stagnation. Let me remind you, by the way, that on the eve of Belarus, Kazakhstan and the Russian Federation joining the Customs Union, Belarus devalued its national currency in three times; as a result, Belarusian goods, especially foodstuffs, have become more competitive than the similar products of Russian manufacturers in our market.

Sixthly, the macroeconomic policy under our consideration was profitable not only for "oligarchs", raw materials producers and bankers, but also for other groups of the Russian society, the incomes of which, including average wages, were increasing and catching up with inflation in rubles as well as in US dollars (the indicator of the national average monthly wage has still increased significantly – from 150 to 1000 US dollars, with regard to all of its justly criticized shortcomings: in particular, that it hides an excessive income stratification of the citizens). However, a number of essential remarks should be made in this connection. First, it was possible due to the high prices for export goods, which can slump overnight; speaking of which, the good example is the 2008–2009 global crisis. Second, a significant share of population's incomes has been and is going abroad (purchases of imported goods, buying goods and real estate abroad, capital outflow, etc.); the share of incomes of the population is unlikely to exceed 25% in the general revenues structure of our dollarized economy. Third, the increase in the incomes of Russia's citizens in the recent years results from the revaluation of the ruble exchange rate, rather than from the growth of national economy, let alone the enhancement of its efficiency. And this could not but affect the political situation in Russia, because it triggered a contradiction between the interests of national consumers and domestic producers, which led to open social and political excesses at the end of 2011–2012. And if the criticized macroeconomic policy is carried on, the contradiction between consumers and commodity producers will only grow, in my opinion.

Consequently, it is necessary to change this policy in order to solve this contradiction and in a broader sense – to shift our economy from a raw-materials-based growth to a rapid, sustainable and balanced growth.

**– What do you think this change will be, what are the contents and the subordination of the relevant proposed measures?**

– Since there is a problem of facilitating the development of any market economy, it is necessary, first of all, to pay attention to the task of stimulating the impact on the aggregate effective demand and on its structure. I believe that, given the current situation in Russia, it is more expedient to reorient the general demand of the population, business and government toward import-substituting products, i.e. goods and services of domestic origin, than just to expand this demand. Meanwhile, in order to create the proper environment for boosting domestic producers, a large-scale application of administrative methods that conflict with the legal framework of the WTO is almost impossible. Using the set of economic methods that are directly associated with the increase in production efficiency and labour productivity requires substantial financial resources and a lot of time; and the application of institutional methods, related mainly to the improvement of innovation climate, may turn out unsuccessful in the current circumstances. Hence and in the context of the above, the devaluation of the Russian ruble is considered to be the top-priority and the most efficient way to re-orient the demand from the external to domestic market.

However, we can not simply devaluate the national currency, as it may cause a surge of inflation and downfall of incomes, which means that the standard of living in Russia will deteriorate, like it happened in the August 1998 and in the first months after the default. However, in my opinion, there is a possibility to curb these negative processes efficiently by supplementing the specified initial measure with a complex of other ones. I will mention only the main guidelines of action without producing a comprehensive list of related measures.

A reduction in the value of the ruble should, first of all, be accompanied by certain measures to control the prices for goods and services (wholesale and retail), well known from the experience of the developed countries. Here we should admit that Russia has such an inefficient policy concerning prices regulation, which, perhaps, no other country does. This very circumstance – an exceptional weakness of state regulation in the sphere of production costs, profitability, inter-sectoral costs etc., combined with the poor "self-regulating" market competitive environment, instigates manufacturers and intermediaries in their presumptuous desire to jack up prices in pursuit of super profits and special benefits. And no wonder that, for instance, the actual crisis that is observed in the meat sector of agriculture due to a 30–40% reduction in procurement prices after Russia's accession to the WTO has in no way affected the prices for meat and meat products in trade: the latter continues gaining super profits by using its monopolistic opportunities.

If we could optimize and mutually harmonize the expenses on intermediary services, administration and management, on the provision of business safety, the amount of rent payments for the use of real estate and land, the cost of services of numerous regulatory and licensing organizations, the payments to creditors, the cost of access to infrastructure, etc.; if, in addition, we could restrict the level of profitability for all economic entities in the domestic market by at least 25%, it would be possible, I suppose, to reduce the cost of goods and services in general by 30–40%. In the conditions of inevitable increase in prices for imported goods under the ruble devaluation this would become a major economic and social damper in the consumer market of the country.

Secondly, the refinancing rate of the Bank of Russia should be limited at 0.5–1.0% per year, and granting loans of commercial banks – 3–5% per annum. Up to this level, it would be important to reconsider the rates for all previously issued commercial credits, including mortgage loans; as for the loans granted in foreign currency, they should be translated into rubles at the exchange rate at the time of their provision. It is also considered expedient to abandon the current practice of subsidizing interest rates for individual industries and business entities by the state; the saved hundreds of billions of budget money should be spent on the temporary maintenance of the rates on bank deposits of the population.

It is clear that restoring order in the financial sphere would lead to a powerful revival of economic life in Russia. At that, the possible temporary lack of resources in the banking system would be expedient to cover at the expense of loans of the Bank of Russia, especially since it would develop significant ruble liquidity after the revaluation of gold and foreign currency reserves due to the devaluation of the national currency.

Thirdly, the state should be a powerful driving force in promoting economic growth and domestic demand concerning the allocation of funds for the development of transport infrastructure, primarily, motor roads. In this case it will be necessary to establish control over the pricing in road construction. For instance, the cost of a four-lane road, conforming to all modern standards, should not exceed 3–4 million US dollars per kilometer. Until 2020 it is actually possible to build no less than 50 thousand km of modern highways, which would connect not only the regional centres, but the majority of district centres as well. A source of funding could be found in the target infrastructure loans granted by the Central Bank to Russia's regions; these loans would pay off within 10–12 years through the annual GDP growth of 4–6% only due to the increase of the quality of roads.

Another promising area of economic growth, stimulated by the government, is individual housing construction and creation of the relevant infrastructure. By establishing a skillfully organized system of collaboration and partnership between the state, regions, builders and banks, it is quite possible to bring the annual volume of individual housing construction in the country up to one million individual houses, or 130–150 million square meters per year. The support to only these two areas would generate a powerful multiplicative effect of economic growth in all sectors over the next 10–15 years, with actual positive consequences in terms of strengthening social stability and consolidation of the Russian society.

Fourthly, proceeding from the fact that any actions for stimulating economic growth are doomed to failure without the availability of a necessary amount of qualified personnel in the labour market, the country should urgently launch the reform of vocational education, aimed at its revival and its maximum adaptation to economic needs. Here it is necessary to establish the balance of interests of the state, employers, educational institutions and students.

**– It is obvious that such changes in the state economic policy require, as it is commonly believed, "a due expression of the supreme political will"...**

– Yes, the economic recovery is impossible without consolidated actions of all the members of society; these actions can be provided only by the supreme official of the country, who enjoys the trust of people. The proposed changes are the transformations that should be the concern of the presidential level.

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# Accounts Chamber of the Russian Federation: 2014–2016 draft budget will not allow Presidential Decrees of May, 2012 to be executed

*The article presents the comparative analysis of the conclusions of the Accounts Chamber on the draft laws on the federal budget, executed in 2013 and 2012. The specifics of the conclusion on the draft law on the federal budget for 2014–2016 are characterized. The article highlights critical remarks of the Accounts Chamber of the Russian Federation on the given draft law, in particular with regard to the economic and financial parameters associated with the implementation of the Decrees of the President of the Russian Federation of May 7, 2012.*

*Accounts Chamber of the Russian Federation, draft federal budget, economic parameters, income and expenses, risks.*

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In compliance with the Budget Code of the Russian Federation, the Law "On the Accounts Chamber of the Russian Federation" and other legislative acts of the Russian Federation, the Accounts Chamber of the Russian Federation annually prepares the conclusions on the draft law on the federal budget for the forthcoming and two subsequent years.

On October 14, 2013 the Accounts Chamber executed the conclusion on the draft Law on the budget of the Russian Federation for 2014–2016 and submitted it to the federal authorities. We have studied the document's content and compared it with the conclusion made in 2012.

The comparative analysis of the main theses of the conclusions of the Accounts Chamber of the Russian Federation on the draft laws on the federal budget for 2013–2015 and 2014–2016 showed that the comments made by the main controlling body of the country are a lot alike.

First of all, it concerns the following aspects of fiscal policy:

• the presence of system risks of budget implementation related to a slowdown in Russia's economic growth, probable crises in the world commodity and financial markets, high dependence of the economy and the budget system on the foreign economic environment, limited domestic financial resources, insufficient development of the financial infrastructure;

• low quality of macroeconomic forecasts, which is manifested in material inconsistency of the dynamics of forecast and reporting macroeconomic indicators for a number of years;

• certain provisions of the President's budget message have not been implemented by the Government of the Russian Federation;

• existing risks of non-compliance with the Presidential Decrees of May 7, 2013, indicated by the negative dynamics of certain target indicators characterizing economic state (labour productivity, investments in fixed capital);

• income, not substantiated by relevant calculations, amount of which makes annually over 400 billion rubles, or about 3% of the anticipated profits, which reduces the budget transparency and exceeds the indicators of the previous budget cycle;

• growth of interest payments, exceeding the amount of many important funding streams;

• lack of the forecasting of debt sustainability of the Russian Federation;

• failure to provide the required financing of the implementation of federal target programmes;

• annual reduction of budget funds for the implementation of the target investment programme, accompanied by an adequate reduction in the number of commissioned facilities (from 11.6% for 8 months of 2012 to 1.8% for the same period in 2013);

• retention of risks in the stabilization of territorial budgets, related to the growing volume of debt obligations of the subjects of the Russian Federation and annual reduction of interbudgetary transfers.

However, it is impossible to ignore fundamentally new points contained in the conclusion on the draft law on the budget for 2014–2016.

1. This is the first time the Accounts Chamber concluded that the **forecasts, on the basis of which the budget is made up, are insufficiently accurate and reliable.**

The conclusion states the following: "The dynamics of macroeconomic indicators in the forecast does not comply with the dynamics of the corresponding indicators in any of the scenarios, presented in the forecast of socio-economic development of the Russian Federation until 2030".

**2. The Accounts Chamber questions the possibility of achieving the planned parameters of internal loans and proceeds from privatization**. In 2012, only 911.9 billion rubles, or 69.6% of the forecasted volume, were attracted to the domestic market, and the income from privatization amounted to 43.9 billion rubles, or to 74.7%. For the eight months of 2013 loan performance in the domestic financial market will make 42.8% and the cash flows from privatization – 38.7%. It can be concluded that in case of shortfalls of proceeds from privatization, the government will have to search for additional sources to cover the 2014–2016 deficit.

3. The auditors of the Accounts Chamber are also concerned with the growth of Russia's foreign national debt: it increased from 28.3 to 31.6% of GDP in 2012, and to 33.5% of GDP for the nine months of 2013. Now this corresponds to average risk, while in 2011, the ratio amounted to approximately 29% and corresponded to low risk in the IMF measurement system.

4. The omissions of the certain provisions of the Budget Message are enumerated in greater detail in comparison with the previous conclusion, in particular:

✓ long-term budget strategy until 2030 has not been approved;

✓ Tax Code has not been amended with regard to taxation of real estate;

✓ the comprehensive system of state programmes that allows the goals and strategic objectives of socio-economic development to be achieved through the complex of interrelated activities and interindustry cooperation, has not been formed. The structure and the content of most government programmes are to be finalized. The transition to performance-oriented budgeting at this stage in most of the state programmes is substituted by the financing from progress (the achieved), and most of the executed programmes to a considerable degree are a set of expenditure requirements, insufficiently substantiated with well-grounded goals, objectives, indicators[1];

✓ the issue concerning the consolidation of subsidies to the regional budgets, and transfer of accurate information on the volume of interbudgetary transfers to the regions prior to the beginning of territorial budgets formation, has not been solved.

5. **The shortfall in income of the federal budget in case of the changes in macroeconomic indicators is estimated**: from payment of income tax – 380.1 billion rubles, VAT – 2142.6 billion rubles, export duties – 71.9 billion rubles. Total budget is at the risk of not receiving 2.6 trillion rubles.

6. It is indicated **that the submitted draft law does not assess the impact of special procedure of tax computation by consolidated taxpayer groups on the volume of profits from income tax of organizations** (in the author's opinion, the reasons are clear: the first year of CTG operation has shown the ineffectiveness of this institution).

7. The section devoted to subfederal budgets is presented more fully. The attention is given to **the change in the government debt structure of regions towards the increase in the number of credits** received in commercial banks (the proportion of borrowings rose from 25.6% to 32.4% for 2011–2012). In the future it may negatively affect the stability of not only the budget, but the banking system as well.

The amount of subsidies to regions is reduced by 10 as compared to 2013-level (from 93 to 83). And only 10 subsidies are distributed in terms of the subjects of the Russian Federation. The rest are not distributed, that, undoubtedly, will affect the formation quality of territorial budgets.

8. **The methodology of the federal budget formation has been criticized:** methodological guidelines for income calculation have not been developed; the budget classification in terms of reflecting programme expenditures has not been amended[2]; the target indicators assessing the effectiveness of providing single subventions to the regions has not been approved. All this reduces the budget transparency.

[1] From the notes of the statement, made by the Chairman of the Accounts Chamber of the Russian Federation T.A. Golikova during the parliamentary hearings on the draft federal budget for 2014–2016 (October 8, 2013): "At present, the budget parameters exist by themselves, the state's programmes with their passports, which are additional materials to the draft budget for 2014–2016, exist independently and do not intersect. Yes, Anton Germanovich Siluanov stated that these programmes should be finalized within the specified period (deadline – October 29), but nonetheless, the volume for the finalization is so large (as they don't match neither to the indicators, stated in the programmes, nor to the budgetary allocations from the 2014–2016 budget) that the shortcomings of the state programmes will most probably not be covered for the current period of one month".

[2] From the notes of the statement, made by the Chairman of the Accounts Chamber of the Russian Federation T.A. Golikova during the parliamentary hearings on the draft federal budget for 2014–2016 (October 8, 2013): "Unfortunately, at present the budget classification, that was applied to the state programmes, has not worked. It is almost impossible for non-specialists to compare the indicators of 2014, 2015 and 2016 with the indicators of 2013".

The government of the Russian Federation ignored the repeated recommendations of the Accounts Chamber to elaborate a set of specific measures aimed at the development of the income potential of the country's budget system, including those relating to the curtailment of the shadow economy; evasion of taxes and other obligatory payments, including both transfer pricing and operations through offshore zones; improvement of the control work of tax and customs authorities, enhanced performance of tax control with regard to VAT refund from the federal budget; optimization of the existing system of privileges and preferences; reduction in tax and non-tax liabilities; revenue increase from the management and disposal of the state property; enhancement of the state control efficiency in the sphere regulating production and turnover of alcohol and alcohol-containing products.

The supreme executive branch ignored the recommendations on the adoption of measures to maintain the moderate debt burden both on the federal and on the regional budgets, to affect appropriately the debt policy of the corporate sector, and to improve the quality of debt sustainability forecasting.

The Annex to the article provides a comparison of the conclusions of the Accounts Chamber on the draft laws on the federal budget for 2013–2015 and 2014–2016.

Annex

Comparison of the main theses of the conclusions of the Accounts Chamber of the Russian Federation on the draft laws on the federal budget for 2013–2015 and 2014–2016

| **Conclusion on the budget plan for 2013–2015** | **Conclusion on the budget plan for 2014–2016** |
|---|---|
| The forecasted volumes of investments in the fixed capital could be insufficient for settlement of the tasks, set by the President of the Russian Federation, aimed at modernization, technical re-equipment and transition of the economy to the innovative path of development**. Basic production assets to a large extent are physically out of date, and the process of their renewal is going very slowly. Besides the main part of investments is forwarded not to the high-technology spheres, but to the spheres, connected with production of goods with low share of added value.** | The forecasted volumes of investments in the fixed capital could be insufficient for settlement of the tasks, set by the President of the Russian Federation, aimed at modernization, technical re-equipment and transition of the economy to the innovative path of development.<br>Taking into account the state of basic production assets, it is necessary to emphasize that the insufficient volume and efficiency of investments in fixed capital reduce the improvement pace of economic structure, the growth of labour productivity and do not allow overcoming raw-material orientation. |
| Comparative analysis of the dynamics of macroeconomic indicators established over the past years, shows their significant deviation from the forecast values. | Comparative analysis of the dynamics of macroeconomic indicators, established over the past years, shows their significant deviation from the forecast values. **This indicates that the forecasts under development are insufficiently accurate and reliable.** |
| Comparison of the forecasts, made by the Government of the Russian Federation and leading international economic organizations, suggests that Russia's position regarding economically developed countries by important macroeconomic parameters will not improve fundamentally in the short term. In addition, the dynamics of macroeconomic indicators of Russia is much less than of the number of developing countries, including some CIS countries. | Comparison of the forecasts, made by the Government of the Russian Federation and leading international economic organizations, suggests that Russia's position regarding economically developed countries by important macroeconomic parameters will not improve fundamentally in the short term. Moreover, the dynamics of macroeconomic indicators, characterizing socio-economic development of the Russian Federation, is significantly exceeded by the dynamics of the corresponding indicators of the number of developing countries, including some CIS countries. |
| However, the work on the implementation of certain provisions of the Budget message was not completed, when elaborating the draft of the federal budget for 2013 and for the planned period 2014 and 2015 (data as of October 1, 2012). | However, the work on the implementation of certain provisions of the Budget message was not completed, when elaborating the draft of the (data as of October 1, 2013). |

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| The government of the Russian Federation, federal and regional executive authorities have been carrying out work to implement the decrees of the President of the Russian Federation of May 7, 2012. However, **it seems difficult to achieve the parameters, set by the President of the Russian Federation** by certain macroeconomic indicators (share of capital investments in GDP and productivity growth) **in the long term**. | The government of the Russian Federation, federal and regional executive authorities have been carrying out work to implement the decrees of the President of the Russian Federation of May 7, 2012. Nevertheless, the dynamics of certain target indicators, for example, characterizing the state of the economy (labour productivity, investment in fixed capital) forecasted for the 2014–2016 period, allows making a conclusion on the risks of the failure to achieve them within the established deadlines. |
| The materials to the draft law do not comprise the calculations of income, the share of which amounts to 2.8% of the forecasted amount of revenues to the federal budget in 2013, 2.7% in 2014, and 2.6% in 2015 | The materials and documents submitted along with the draft law, do not comprise the calculations of revenues that make up **annually more than 400 billion rubles**, or about 3% of the forecasted revenues, which reduces **the budget transparency and exceeds the indicators of the previous budget cycle.** |
| In 2013–2015 there are risks of implementing federal revenues due to a decrease in prices for the Urals oil and oil products as compared to the forecasted prices. | The main risks in receiving the forecasted volume of revenues may be also related to the lower prices for the Urals oil, oil products, natural gas, as compared to the forecasted **non-achievement of the forecasted volume of GDP and the export of goods.**<br>There are risks of delayed revenues in the federal budget, including the profit from **tax income (380.1 billion rubles in 2014), goods (works, services) VAT, implemented in the territory of the Russian Federation (2 142.6 billion rubles), in case of changing parameters of GDP and other macroeconomic indicators, export duties on oil and oil products, delivered to the Republic of Kazakhstan and the Republic of Belarus, in case the issue concerning duty-free supplies of Russian oil to the States of the Customs Union is not settled (71.9 billion rubles)** |
| The volume of the expenditures for the repayment and servicing of the state debt of the Russian Federation to the total volume of expenditures (debt-to-equity ratio) will amount to **87.5%** in 2013, 91.9% in 2014. | The volume of the expenditures for the repayment and servicing of the state debt of the Russian Federation to the total volume of expenditures (debt-to-equity ratio) will amount to **81%** in 2014 , 79,7% in 2015, 75.1% in 2016. |
| The state internal debt with the state guarantees will increase by *1.6* **trillion rubles,** or **2.5 times** in *2015*, as compared to 2012, and will make up 2.7 trillion rubles; the state external debt with government guarantees – **1.8 times** and will amount to *30.4* billion US dollars (**1 024.5 billion rubles**). | The state internal debt with the state guarantees in native currency will increase by **63.8%** in 2016, as compared to *2013*; state external debt with government guarantees in foreign currency – by **33%.** |
| The expenditures for servicing of the state debt will increase from 383.3 billion rubles in 2012 to 508.0 billion rubles in 2015. The volume of the indicated expenditures will considerably exceed the budgetary appropriations, which will be allocated in 2015 for public utilities sector, protection of environment, culture, cinematography, physical culture and sports, mass media **(327.6 billion rubles)**, healthcare **(373.1 billion rubles**) and are comparable with the expenditures for education **(591.9 billion rubles)**. | The expenditures for servicing of the state debt will increase from 408.4 billion rubles in 2013 up to 568.6 billion rubles in 2016 **(1.4 times)** and will considerably exceed the budgetary appropriations, which will be allocated in 2016 for public utilities sector, protection of environment, culture, cinematography, physical culture and sports, mass media, as well as for healthcare. |
| The established amount of the debt burden requires constant monitoring, analysis and assessment of possible risks associated with the growth of debt. Therefore, it is necessary to establish the mechanism of operational impact on the debt policy of the corporate sector, including the decision making procedure of state corporations with regard to borrowings in foreign currency. | Further increase in borrowings, expected in the next years, causes the necessity of the realistic assessment and forecasting of the debt sustainability of the Russian Federation, the monitoring of all debt types and requires **the Government of the Russian Federation to affect** the debt policy of the **corporate sector more significantly**. |
| The volume of budget allocations does not correspond to the amount of financing, stipulated by the passports of programmes in 26 programmes out of 50 (**46.4% of the overall number**) listed in the Federal Target Programmes, included in the draft law for 2013. Despite the incomplete use of budget funds by certain Federal Target Programmes in 2011, non-achievement of the target indicators, low application of funds in the past period of 2012, the draft law envisages the increase in appropriations for 2013–2015 by these programmes. | In 2014 the volume of budget allocations does not correspond to the amount of financing, stipulated by FTP passports, and is significantly below the level of previous years in **practically all Federal Target Programmes**.<br>Despite the incomplete use of budget funds by certain Federal Target Programmes in 2012, non-achievement of the target indicators, low application of funds in the past period of 2013, the draft law envisages the increase in appropriations for 2014–2016 by these programmes. |

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| The federal budget expenditures on the Federal target investment programme in 2013 are provided within 854.3 billion rubles, which is **by 55.5 billion rubles, or 6.1% below the level of the previous year,** in 2014 – 749.0 billion rubles, in 2015 – 781.1 billion rubles. FTIP share in the total volume of the departmental structure of the federal budget expenditures decreased from **7.4% in 2013 to 6.4% in 2014 and 2015**.<br>According to the Ministry of Economic Development of Russia, **161 facility, or 11.6% has been set in operation**, out of 1387 commissioned facilities **for 8 months of 2012**. | The federal budget expenditures on the Federal target investment programme in 2014 **decrease by 11.3%,** as compared to the previous year; increase by 9.4% in 2015, while in 2016 the expenditures are expected to decrease by 12.1%. FTIP share in the total volume of the federal budget expenditures is decreasing from **6.8% in 2014 to 6.1% in 2016**.<br>According to the Ministry of Economic Development of Russia, **18 facilities, or 1.8% have been set in operation**, out of 978 commissioned facilities **for 8 months of 2013**. |
| Risks in ensuring the stability of regional and local budgets associated with substantial debt obligations remain. According to the Ministry of Finance of the Russian Federation, the amount of the total budget debt of the subjects of the Russian Federation and municipalities was **1 319.25 billion rubles as of August 1, 2012 (1.9 times increase in comparison with the pre-crisis level of 2008)**, including the state debt of the subjects of the Russian Federation – 1 111.1 billion rubles (1.85 times). | Risks in ensuring the stability of regional and local budgets associated with substantial debt obligations remain. The amount of the total budget debt of the subjects of the Russian Federation and municipalities was **1 599.9 billion rubles as of August 1, 2013 (2.3 times increase in comparison with the pre-crisis level of 2008),** including the state debt of the subjects of the Russian Federation – 1 352.9 billion rubles (2.3 times). **Moreover, in 2012 the debt exceeded 50% of the income volume of the regional budget, excluding inter-budget revenues in more than one third of the regions.** |
| Considerable load on the regional and local budgets with regard to the repayment of the existing budget loans will remain in 2013-2015. **The total repayment of budget loans amounts to 400.3 billion rubles.** | Considerable load on the regional and local budgets with regard to the repayment of the existing budget loans will remain in 2014–2016. **The total repayment of budget loans amounts to 341.2 billion rubles.** |
| The increase in revenues of the consolidated budgets of the subjects of the Russian Federation is provided by the means of increase in receipt of tax and non-tax revenues, with simultaneous decrease in the volume of inter-budget transfers, granted from the federal budget. In 2015 the volume of inter-budget transfers to compare with 2012 will decrease by 14.9 %. | The increase in revenues of the consolidated budgets of the subjects of the Russian Federation is provided by the means of increase in receipt of tax and non-tax revenues, with simultaneous decrease in the volume of inter-budget transfers, granted from the federal budget. In 2016 the volume of inter-budget transfers to compare with 2013 will decrease by 6.1%, **and in the form of financial assistance (excluding subventions) – by 15.2%.** |
| Inter-budget transfers will amount to **46.7%** in 2013 (in 2012 – 49.4%) in the total revenues of the Pension Fund of the Russian Federation, 44.7% in 2014, and 45.1% in 2015. This indicates the continuing dependence of the PFR budget on the budget allocations from the federal budget at a sufficiently high level. | The share of inter-budget transfers will amount to **38.9%** in 2014 in the total revenues of the Pension Fund of the Russian Federation, and will make up 41.2% in 2015 and 2016 (in 2012 – 49.4%, in 2013 – 46.8%). This indicates the continuing dependence of the PFR budget on the budget allocations from the federal budget at a sufficiently high level. |
| In accordance with the opinion of the Accounts Chamber it is vital to prepare a complex of measures aimed at development of the revenue potential of the budgetary system of the Russian Federation in the volumes, which could provide long-term balance and sustainability of the budgetary system. | In accordance with the opinion of the Accounts Chamber it is vital to prepare a complex of measures aimed at development of the revenue potential of the budgetary system of the Russian Federation in the volumes, which could provide long-term balance and sustainability of the budgetary system. |

*From the Editorial Board.* In the previous issue of the journal we published a number of materials regarding the draft federal law on the reorganization of the Russian Academy of Sciences. Related problems have been set out clearly in the published "Open letter to the President of the Russian Federation V.V. Putin by Academician Zh.I. Alferov". As is known, in the course of further elaboration of the draft law it was possible to reach a compromise on a number of pressing issues. In September, the law was passed by the chambers of the Federal Assembly and signed by the President of the Russian Federation. The law establishes the Federal Agency of Scientific Organizations (FANO), which should become the structure that manages the property of the Academy of Sciences. A working group has been formed to work out the regulations of the Agency; the group includes representatives of RAS, the State Duma, the Council of Federation and the Ministry of Education and Science. Draft regulations have been submitted for public discussion. Conceptual aspects of organizing the activity of the reorganized Russian Academy of Sciences require careful consideration of the views expressed at the discussions. An article by the Deputy Director of the Institute of System Analysis, Doctor of Economics, Professor A.N. Shvetsov "Russian Academy of Sciences – another target of devastating reforms", published in the Russian economic journal, Issue No.4, 2013 can be distinguished among them, as it provides well-grounded argumentation and sound reasoning. Despite the fact that the proposals were formulated by the author prior to the adoption of the law, a number of them, especially in the final part of the article, are very important in the ongoing activities for the implementation of the law. This part of the article by A.N. Shvetsov is presented below.

**Shvetsov A.N.**

# Russian Academy of Sciences – another target of devastating reforms

**4. Controversial federal draft law – a sentence passed on RAS and Russia's fundamental science.**

Concluding the speculations concerning the future of Russia's academic science, I would like to make direct comment on this draft law ("On the Russian Academy of Sciences, the reorganization of the state academies of sciences and amendments to certain legislative acts of the Russian Federation"), adopted by the State Duma in the second reading at the end of the 2013 spring session. It is very likely that it will soon be enacted into law, and all the debates in this regard will, probably, acquire a purely historical interest. It might be, however, that this would not happen, for some reasons, and a decision would be made on a comprehensive revision of the draft law or even there might be a possibility of adopting a fundamentally different legal act on the issues of RAS reforming. And both cases would require expert assessments and proposals, and therefore, considerations on the essence of the given document, which is more than controversial, might be useful.

The considered version of the draft law, promulgated after its second reading in the Duma, judging by its easily predictable consequences for the present-day RAS, is not different from the initially version submitted to the Federal Parliament. An important thing is that the document, even in its new edition, "works" for the same purpose of the reform, namely, the disintegration of the Academy as a single self-regulatory system by singling out the team of full-fledged members of RAS (who, as

a matter of fact, will work under its guise in the new conditions), separating this new formation from research institutes and depriving it of the responsibility for organization, performance and efficiency of research activities carried out in the current network of academic institutions. All speculations about the "new role" of RAS are just idle talk not backed by anything, for the Academy will not be given the powers and resources to solve even those problems which are stated in the present draft law. The Academy will become an "interest club", the loyal behaviour of which is provided by significant intervention in its internal affairs.

The merging of the three academies will turn the general meeting into an inefficient, easily managed body at least due to the absence of internal historically established unity between the three components of its participants and because of their connectedness with different superior bodies (Russian Academy of Agricultural Sciences is "supervised" by the Ministry of Agriculture, the Academy of Medical Sciences – by the Ministry of Healthcare, the Academy of Sciences itself – by the Ministry of Education and Science). And RAS itself in its new form will become a structure (probably, departmental rather than governmental) with little authority, which is fully accountable to the executive power. It will lose its nationwide status and the ability to conduct more or less independent expert examinations; its separation from its own institutions will challenge the validity of electing new members and increase the probability of admitting random people by the patronage of officials. All this will also lead to a decrease in the international authority of RAS, and it will cease to be considered as the representative of the Russian science in the international arena.

Adoption of the draft law in the legal sense would mean the elimination of the existing Russian Academy of Sciences; according to the basic logic, the members of the liquidated organization (academicians) should also disappear. However, the document provides for the convening of a kind of general meeting consisting of no one knows whom and in an unknown quantity; besides, it is not clear how this body will operate, how it is expected to adopt the Charter (which actually should define, who the academicians are and how they should function). This anti-logic and the disregard of legal correctness, apparently indicate not so much the low professionalism of the authors of the draft law, but that the issue of formation of the new Academy, from their point of view, is a secondary one. And the most important for them is the organizational separation of RAS as a subject of management (general meeting, Presidium, apparatus) and research institutes as an object of management.

At that, the fate of the national fundamental research and scientific institutions, where it is conducted, may be even more deplorable than that of the Russian Academy of Sciences itself. This forecast is based on the following two groups of considerations. The considerations of the first kind consist in the fact that sudden changes in the current (reformed) system will lead to failures in the implementation of all functions ensuring the existence of RAS – financing, procurement, maintenance, execution of contract works, conclusion of new contracts, etc. Budget financing will not open until the situation with the status of institutions becomes clear; but even when the status is gained, it will not lead to immediate opening of funding, because it is subject to its own budget-related rules and procedures. It is sad that the authors of the document have not proposed any transitional damping measures in this respect, which are mandatory when carrying out such radical transformations.

Further, the dysfunction will inevitably get worse through the gradation of institutions planned by the legislators, i.e. the organization of inspections, the work of commissions and other activities with the subsequent application of organizational measures.

Judging by the degree of morbidity of their consequences, the institutions subject to the immediate reorganization (liquidation) will be in the most favourable position. The institutions, re-subordinated to other agencies, will have a difficult period of searching for a place in the new structures, and they will also have to address the issues of financing, material and technological support, and to build relations with new higher-level institutions. The remaining institutions will face certification, structural changes, the shaking up of personnel, the increase of tension in labor collectives etc.; this will continue for an indefinitely long period. It is clear that the most active, healthy and important part of the researchers and personnel working with complex technical devices, will try to find other jobs, for in such circumstances, it would not make sense to lose the best years (which are so few in the scientific life), and young people will hardly find any incentives for choosing science as their occupation under the given circumstances.

In this connection it is necessary to point out some easily predictable challenges that are somehow not mentioned when discussing the reform. It primarily concerns the fact that the employees of institutions will loose a highly prestigious status of the associate of the Academy of Sciences. Although this status deteriorated significantly in the post-Soviet period, it still partly compensated for low salaries, and for the conditions of research work lagging behind the international standards, and other negative points; it also left a hope for radical improvements in the organization, which is fundamentally important for the country.

One more fact: the notorious "disposal of the burden of elderly workers" is fraught with the erosion of specific academic culture of communication, the loss of specific relationships and ways of ensuring professional integrity and reputation.

Thus, the adoption of the post-reform scientific system will start "from scratch" – without history, traditions, experience of older generations, which will be synergetically superimposed on the situation of financial, material and organizational confusion.

Such kind of stagnation situations are extremely favourable for adventurers, careerists and other rogues; such situations are often accompanied by arrogance, meanness, lie, treachery, hypocrisy – everything that is absolutely inconsistent with the maintenance of normal research environment. If our society in general still cannot fully recover psychologically after the "turbulent 1990s", then the especially "sensitive" academic community, which has already suffered greater than others, now has to face the described gloomy prospects. By the way, one should not forget the tragic precedent of Germany: German science, being the world leader in the early 20th century, was not able to regain its leadership after the Nazi interference, despite the outstanding achievements in the country's political and economic development.

The second group of fears concerning not only the development, but also the very existence of fundamental science in Russia, is connected with the fact that the reformers have presented virtually no evidence that the results of the reform would be positive. Its substantiation is reduced completely to the above mentioned rebuke for the inefficiency of RAS, but nothing has been said about the very reasons why the new system of organization of science will be better than the existing one. One can argue at length whether academicians, in principle, are able to manage scientific property efficiently, but, please, do prove that "a new federal body of the executive power", the functions and status of which are not stated in the draft law, will manage this property more efficiently. The actually state of affairs in the management of state property in general can be observed for more than 20 years: in fact there are no

examples of its effective involvement in national interests[1]. To put it mildly, the doubtfulness of the claim that the "new authority" will use state property more efficiently than the existing RAS, is aggravated in the context of the regulation, which transfers to this authority the *"management"* of all the institutions (Paragraph 9 of Article 18, Chapter 6 of the draft law), i.e. it assumes the responsibility not only for the effective disposal of property, but for scientific research as well. Here a rhetorical question arises: what resources, primarily intellectual, can the infamous "agency" possess to maintain the efficiency of scientific research at least on the same level?

It is difficult to abandon the assumption that this agency is not going to take part in the organization of scientific research. After the epic division of the institutions into three categories has come to an end, the agency will revise the property of the first two of them and will then withdraw the identified "surplus". Then the institutions, remaining in the sphere of RAS, will be transferred to universities according to the following specialization: physics – to MFTI, MEPhI, MSU and MPEI, chemistry – to MSU and some other, social sciences – to NRU HSE. The Siberian Branch of RAS will become part of NSU, Far-Eastern Branch will join FEFU (the stones of Russky Island are waiting for their intellectual framing!), etc. Although the real consequence of this maneuver will be the disappearance of the historical phenomenon of RAS, it will be possible to show the unprecedented pace of development of University science to the whole world!

Thus, the implementation of the considered draft law would lead to the collapse of Russia's fundamental science as an integrated state system. At best, it would be highly compressed and fragmented; maybe some of its centres would be preserved in some universities (for example, the department of mechanics and mathematics and the faculty of physics at MSU) and in the military-industrial complex. Fundamental science will be increasingly transformed into applied science, because the successful development of basic research requires special intellectual and institutional environment promoting free submissions and discussions of scientific problems; the defense sector, in the absence of RAS, can not ensure such an environment, of course. The forecasted evolution of the system will be aggravated by the resignation of active and able-bodied researchers, including youth and by their leaving the country, by the loss of academic traditions and culture, by the replacement of leaving scientists with adventurers, climbers, rouges and other human "scum", inevitably popping up in the periods of stagnation and troubles, triggered by large-scale destructive reforms.

**5. Summary conclusions and recommendations**

The main ones, addressed to the persons, making governmental decisions in the sphere of Russia's scientific development, are the following. You should not look up to the "West" with adoration and jealousy; and you should not blindly seek to adopt someone else's, in particular, American system of organization of science, without a clear understanding of its merits, and, most importantly, weaknesses. This approach will inevitably aggravate the situation: our own problems will multiply by serious flaws of the foreign system, which in all of its surface splendor is itself facing difficult challenges. The only reasonable efforts would consist in the conservation and development (of course, not ignoring foreign experience) of the unique Russian scientific-research sphere that is fundamentally different from Western science; these differences are not in the least a disadvantage of Russia's science;

[1] The latest shocking examples of its utilization in directly the opposite interests are given in the article: Dmitrieva O. Specifics of state property management in the Russian Federation. Russian economic journal. 2013. No. 2.

on the contrary, they are its most important competitive advantage. It is crucially important to aim the Russian science toward the increase in its contribution to the development of Russia's economy, industry, and high-tech sectors. And we can not place a priority on publishing research results in foreign journals, following the attempts to copy foreign forms of organizing research activities. Results of domestic scientific achievements should be published in the Russian language and Russian media; if this information is of interest abroad, let them translate the articles into English, as it was practiced in the past.

In conclusion, it remains only to repeat the title of this article and, following many other experts, to call on the public to react adequately to the next forthcoming Herostratos action.

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# Opportunities for and constraints in the modernization development of the regions of the Northwestern Federal District*

*Nation-wide modernization is possible only if it is carried out in all of the regions of a country. And the elaboration of the plans for the country's (regions') modernization implies quite reasonably the comparison of the key parameters of the territory's modernization with those of developed countries, the countries leading in innovation development. Due to significant territorial differences in Russia's development, it is necessary to differentiate the approach to determining the level of the regions' modernization. A scientifically proved strategy is required specifically for each federal district and region (supported by the population and implemented by management authorities), such a strategy should take into consideration the problems hindering modernization in the given territory.*

*Modernization of the regions, socio-economic development, levels of modernization, technological mode, R&D.*

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Modernization has become a worldwide process and it represents an objectively existing global challenge to each country. Recently, Russia has intensified its work on understanding the parameters of this challenge and working out the strategy of action that will ensure the safety and sustainability of our country's development.

Modernization has been a widely discussed issue in political speeches, periodicals, and academic research; the country's leaders set out the objectives, defined the guidelines for further development. The Commission under the President of the Russian Federation on modernization and technological development of Russia's economy [12], later renamed

* The work has been carried out with the support of the RFFR grant, project No. 13-06-00898.

the Council [13] was established in 2009 in order to promote sustainable technological development of Russia's economy, improve state management of modernization programmes. These steps are aimed not only at economic modernization and innovation development, but also at the improvement of state management in this sphere, which means the improvement of investment climate in the country, the establishment of public-private partnership. However, favorable business environment has not been created so far, the country's investment policy has not been stimulated, scientific-technological and economic progress has not been promoted.

*Russia in the world*

Russia's modernization, if considered from the point of view of prospects for a long-term development of economy and society, is primarily a process of transforming the country into innovation-driven power, whose products are competitive in international markets. At that, each new stage of modernization is based on technological, organizational and social innovations, on the changes of technological modes (TM). As S.Yu. Glazyev claims, the new sixth TM, coming to replace the fifth one, provides Russia with the opportunities for technological breakthrough and rapid growth on the crest of the new long wave of economic growth [4]. In this case the fundamental factors include the timely establishment of reserves to form the core of the sixth TM and priority modernization of its main industries: electronic industry, software, information technologies, nanotechnologies, genetic engineering.

The analysis of economic climate shows a great disproportion between Russia and the developed countries, due to technological multiformity, passed on from the Soviet times. The fourth technological mode developed in the USSR with 30 years time delay, as compared with the global trajectory of fuel and energy resources. Moreover, in the course of political and social transformations in Russia, little attention was given to the fifth technological mode connected with telecommunications, microelectronics, low-tonnage chemistry. Thus, for example, Russia has been significantly lagging behind other countries in the quality and quantity of computers. The share of our country on the world stage of supercomputers made up 1.6% in 2013, i.e. 4 times less than Japan and 31 times less than the US *(tab. 1)*. Although some positive growth has been registered in the sphere of computer technologies in the Russian Federation, the rate of increase is insufficient for taking the leading positions. China, aspiring to the position of global leader, has been constantly increasing the pace of growth and has risen from the 15th to the 2nd place over the last 13 years. Russia took the 9th place in the rating of supercomputers in 2013, with a significant lag in productivity, i.e. 25-fold lower than in China and 44-fold lower than in the USA.

Communication component of science and technology progress in Russia has been also developing rather slowly: the number of patents in the field of information and communication technologies (ICT), is not only 75 times lower than that in the three leaders (Japan, USA, European Union), it has declined by 11% from 2006 to 2009. Asian countries are increasingly expanding their domination spheres. For instance, in 2010 Japan caught up with the US, an absolute leader; China, judging by its growth rates, will do the same in the next 10 years *(tab. 2)*.

Analysis of R&D expenditures per capita in purchasing power parity (PPP) shows that Russia lags behind Sweden, USA, Japan, and Germany 5–6 times, from the European Union – 2.7 times *(tab. 3)*. And although Russia has experienced almost a 3-fold increase in expenses over the last 10 years with 71.6 to 235.9 US dollars per capita, growth rate is still lower than in China (for 9 years, the expenses have increased more than 6-fold), which also has one of the lowest values of this indicator.

Table 1. The largest holders of supercomputers
(500 of the most powerful socially well-known world computer systems) [3]

| No. | 10 leading countries | 1997 | | 2000 | | 2004 | | 2007 | | 2013** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Number (items) | TFlops | Number (items) | TFlops | Number (items) | TFlops | Number (items) | TFlops | Number (items) | TFlops |
| 1 | USA | 265 | 10 | 258 | 57 | 262 | 782 | 280 | 4436 | 252 | 152701 |
| 2 | China | – | – | 2 | 0.135 | 14 | 43 | 13 | 175 | 66 | 85176 |
| 3 | Japan | 87 | 0.381 | 62 | 12 | 35 | 124 | 23 | 393 | 30 | 24501 |
| 4 | Great Britain | 24 | 0.607 | 28 | 6 | 34 | 108 | 44 | 526 | 29 | 11032 |
| 5 | France | 19 | 0.677 | 20 | 3 | 19 | 39 | 13 | 198 | 23 | 10881 |
| 6 | Germany | 45 | 0.187 | 65 | 11 | 37 | 69 | 23 | 317 | 19 | 13521 |
| 7 | India | – | – | – | – | 6* | 10* | 8* | 87* | 11 | 3518 |
| 8 | Canada | 7 | 0.124 | 9 | 0.941 | 7* | 23 | 10* | 80 | 9 | 2288 |
| 9 | Russia | 1* | 0.024* | – | – | 2* | 2* | 5* | 44* | 8 | 3475 |
| 10 | Sweden | 8 | 0.215 | 5 | 0.580 | 3 | 6 | 10 | 88 | 7 | 1534 |

TFlops – (***T**rillion **FL**oating point **OP**eration* TFlops = $10^{12}$ Flops Teraflops) – peak performance – theoretical performance limit (expressed through floating point operations) for the given processors.
Letters of references:
* The country is not among the leaders in the given year.
** Sorted out by Number in 2013.

Table 2. Number of patents in the field of ICT – the applications filed
in accordance with the Patent Cooperation Treaty [2]

| | 2000 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|
| Japan | 4761 | 11764 | 11986 | 11997 | 11001 | 12000 | 15189 |
| USA | 18825 | 19514 | 20867 | 19238 | 15743 | 14714 | 15001 |
| EU (27) | 12524 | 13233 | 13723 | 13939 | 13103 | 12232 | 11942 |
| China | 231 | 1936 | 2671 | 3378 | 3207 | 4589 | 5932 |
| Germany | 3960 | 3994 | 4038 | 4204 | 3896 | 3780 | 3817 |
| France | 1498 | 2065 | 1890 | 1995 | 2022 | 1956 | 1995 |
| Great Britain | 2171 | 2063 | 2238 | 2149 | 1922 | 1641 | 1561 |
| Canada | 924 | 1139 | 1166 | 1310 | 1042 | 982 | 1046 |
| Sweden | 1216 | 850 | 1085 | 1229 | 1180 | 1029 | 941 |
| Russia | 179 | 210 | 211 | 191 | 173 | 187 | 203 |

Table 3. Gross domestic expenditures on R&D per capita at current prices by PPP, in US dollars [2]

| | 2000 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|
| Sweden | – | 1313.6 | 1305.5 | 1463.8 | 1340.1 | 1331.4 | 1399.7 |
| USA | 949.4 | 1182.4 | 1259.8 | 1334.0 | 1318.4 | 1319.2 | 1330.6 |
| Japan | 777.4 | 1082.7 | 1156.0 | 1164.7 | 1076.4 | 1100.7 | – |
| Germany | 636.9 | 851.2 | 899.8 | 998.2 | 1005.9 | 1055.3 | 1121.8 |
| France | 542.8 | 661.6 | 690.0 | 725.8 | 767.4 | 770.3 | 796.2 |
| Canada | 543.9 | 739.1 | 753 | 747.7 | 732.7 | 722.3 | 703.5 |
| EU (27) | 381.7 | 512.5 | 544.2 | 588.3 | 595.2 | 607.8 | 632.9 |
| Great Britain | 473.1 | 610.4 | 635.1 | 641.7 | 634.6 | 634.5 | 631.7 |
| Russia | 71.6 | 159.8 | 185.9 | 210.6 | 234.7 | 229.5 | 235.9 |
| China | 21.5 | 65.9 | 77.4 | 90.9 | 115.4 | 132.9 | – |

Sorted by the year 2010.

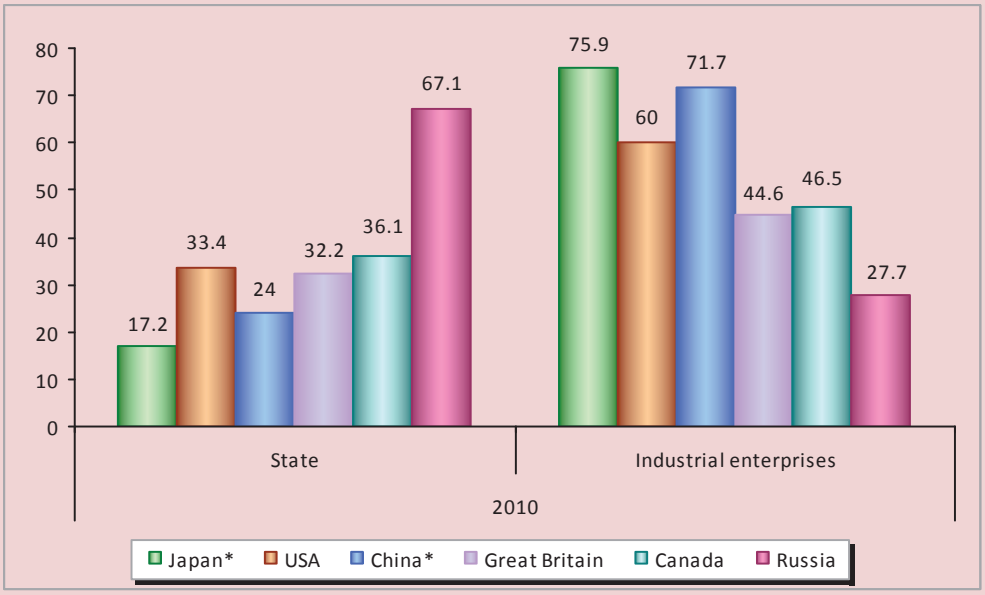
The share of expenditures of private sector on R&D 3–5 times exceeds public spending in the developed countries of the Organization for Economic Cooperation and Development (OECD), and in China *(fig. 1)*. In Russia, on the contrary, this ratio is 1 to 2.5. This is inconsistent with the world trend (see fig. 1). The government finances more than half of the R&D carried out by the private sector. The indicator makes up only 7% for OECD, for China – less than 5%. The main reason of such a situation in the Russian Federation consists in the lack of incentives of the private capital to invest in research and development. The share of budget financing for the last 10 years has increased from 54.8% in 2000 to 67.1% in 2010. This indicates that business is not interested in technological innovation and does not play an important part in choosing and implementing the technologies in production, which is the core of innovation policy.

This means that healthy competition, in which the increase in the volume of sales leads to the growth in the volume of funding of R&D carried out by them.

*Methodological aspects of assessing the territories' modernization level*

In light of the above aspects, special importance is attached to the issues of innovation and modernization development of Russia and each of its regions. China, being rather successful in enhancing the economy and prestige of the country in recent years, at all costs attempts to come into the world leading markets, striving to shift from the agrarian-industrial society to the information knowledge-based society. In this regard, a lot of analytical and forecast research has been carried out by Chinese scientists. At the beginning of the 21st century the Chinese Academy of Sciences (CAS) paid special attention to the issues of modernization in the world and in China [14].

Figure 1. Share of gross domestic expenditures on R&D financed by the government and industrial enterprises, % [2]




* Data for 2009.

Researchers at the China Center for Modernization Research (CCMR) of CAS proposed a comprehensive set of quantitative goals for development, according to the world level of economic modernization of the 20 most developed countries. Since 2001, CCMR annually calculates the indices and phases of the two stages of modernization and their integrated index for 131 countries (including Russia), ranks them and forecasts the main guidelines for the evolution of modernization in the world. The CCMR methodologies can be applied in the measurement of the state and dynamics of modernization processes in Russia's regions. The Centre for the Study of Social and Cultural Change of the Institute of Philosophy of RAS (CSSCC IP RAS, N.I. Lapin) made the most significant contribution to the adaptation of Chinese scientists' methodology for measuring the processes of modernization in Russia's regions [7], supplementing the typology of qualitative states of modernization level of Russia's regions with the types of modernization level, which include the measurement and evaluation of both the level and phase of each of the two stages of modernization – primary and secondary.

The scoring model of primary modernization (PM) was developed with regard to the indicators proposed by A. Inkeles and D. Smith [1]. It takes into account 10 indicators characterizing the three spheres of life of industrial society: economic sphere, social sphere, and the level of knowledge. The average values of indicators achieved by 1960 in the 19 most developed countries were adopted as standard. The ratio of actual value of the indicator to the standard value in a particular year is taken as the value of estimated indicator.

The scoring model of secondary modernization (SM) refers to the information society or knowledge-based society. The SM process began about 30 years ago, but its laws and specifics are still taking shape.

The assessment of SM includes four groups of indicators (innovation in knowledge, transfer of knowledge, quality of life, and quality of economy), comprising 16 separate parameters. Integrated modernization (IM) is understood as a set of state of the two above mentioned stages, which describes the nature of their mutual coordination in a particular country (region) and the difference from the advanced world level. The model of assessing IM takes into account 12 indicators: 10 of them are used in the models of PM and SM, and two were introduced in addition *(tab. 4)*.

*Modernization level in Russia's federal districts*

According to calculations (performed by the authors using a specially developed and patented information analytical system "Modernization", ISEDT RAS) the assessment of the primary modernization indices shows the positive dynamics in the growth of the index during the whole analyzed period (2000–2010) in four federal districts of Russia: the Central, Northwestern, Far Eastern and Ural. In 2009–2010 the PM index declined slightly (from 0.2 to 1.7 percentage points) in the Volga, Siberian, Southern, North-Caucasian federal districts, the reason for this lies apparently in the financial and economic crisis, marked by declining socio-economic indicators.

After 10 years, the gaps in the level of primary modernization between the districts remain steadily at 6 percentage points, while only in the Central Federal District the national level is exceeded. By 2008 the level of primary modernization in all the territories under consideration was above average (index ranged from 91 to 99.9), thus, the federal districts lack from 6.4 to 0.1 p.p to the full implementation of primary modernization. According to the conducted analysis, the implementation of the primary modernization in most districts is impeded by the low life span of the population.

Table 4. Set of indicators used when calculating the indices and phases of PM, SM and IM

| No. | Indicators | Association with indices and phases | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PM | SM | | | | IM | | | PM-phase | SM-phase |
| | | | KI | KT | LQ | EQ | EI | SI | KI | PFM | PSM |
| 1. | Gross regional product (GRP) per capita, US dollars | + | | | | + | + | | | | |
| 2. | Share of persons, employed in agriculture, as a percentage of the total number of employed population* | + | | | | | | | | + | |
| 3. | Share of value added in agriculture in relation to GDP* | + | | | | | | | | + | |
| 4. | Share of value added in the services sector as a percentage of GDP | + | | | | | + | | | | |
| 5. | Share of urban population as a percentage of the total population | + | | | + | | | + | | | |
| 6. | Number of doctors per 1000 population | + | | | + | | | + | | | |
| 7. | Infant mortality (aged under 12 months), per 1000 births* | + | | | + | | | | | | |
| 8. | Life expectancy, years | + | | | + | | | + | | | |
| 9. | Literacy rate among adults, % | + | | | | | | | | | |
| 10. | Share of students attending higher education institutions, among the population aged 18–22, % | + | | + | | | | | + | | |
| 11. | Share of R&D expenditures in GRP (GDP), % | | + | | | | | | + | | + |
| 12. | Number of scientists and engineers per 10 thousand people | | + | | | | | | | | |
| 13. | Number of persons who submitted patent applications, per 1 million people | | + | | | | | | + | | |
| 14. | Share of people attending vocational education institutions, among the population aged 12–17, % | | | + | | | | | | | |
| 15. | Number of TV-sets per 100 households | | | + | | | | | | | |
| 16. | Number of personal computers per 100 households | | | + | | | | | + | | |
| 17. | Energy efficiency: GDP (GRP) per capita/cost of energy consumption per capita, fold | | | | + | | | | | | |
| 18. | Gross national product (GNP) per capita at purchasing power parity, US dollars | | | | | + | + | | | | |
| 19. | Share of value added of the real sector (agriculture and industry) in GRP (GDP)*, % | | | | | + | | | | | + |
| 20. | Share of persons, employed in the real sector in the total employment*, % | | | | | + | | | | | + |
| 21. | Share of persons, employed in the services sphere in the total employment, % | | | | | | + | | | | |
| 22. | Ecological efficiency: GDP per capita/energy consumption per capita (price in US dollars), % | | | | | | | + | | | |
| 23. | Ratio of value added in agriculture to value added in industry, times | | | | | | | | | + | |
| 24. | Ration of employment in agriculture to employment in industry | | | | | | | | | + | |
| 25. | Share of innovation products, works, services, as a percentage of the total amount of shipped products, % | | | | | | | | | | + |

Notes: + indicator participates in the calculation of the index.
Sub-indices SM and IM: KI – knowledge innovations, KT – knowledge transfer, LQ – life quality, EQ – economy quality, EI – economic index, SI – social index, KI – knowledge index.
* Reverse indicator.
Source: The table was worked out by the author on the basis of [7, 14].

The analysis of the second period of regional modernization, which is more advanced and science-intensive and which involves greening and globalization, has revealed that most of the territories of Russia are not ready to meet the world standards. In 2000–2010 Russia's trend of SM indices increased from 61 to 72, thereby it managed to overcome the medial threshold, and the Russian Federation caught up with the Czech Republic. The prolongation of the data shows that by 2020 Russia can join the group of developed countries, in which the SM index is in the range from 81 to 120. However, at the same time, the applied standards are being enhanced, because the indicative socio-economic indicators of developed countries are increasing every year. Thus, considering the competition of countries in overcoming the threshold, the rate of growth in Russia may prove insufficient for modernization breakthrough. Regional gaps between the SM indices were more significant than those between the PM indexes. In 2010, as well as in PM, the leaders in the Russian Federation were the cities of Moscow and St. Petersburg, the list was supplemented with the Moscow, Tomsk oblasts and the Central Federal District. A significant part of the regions had the average level of SM, and in half of them it was below the median level *(tab. 5)*.

Thus, the process of regional modernization in Russia is uneven and asymmetrical, the index of secondary modernization often differs significantly even in adjacent territories.

For example, St. Petersburg outpaces the Leningrad Oblast by 29 points; Moscow is getting ahead of the Moscow Oblast by 23 points. It would seem that the difference is great in both cases, however, the Leningrad Oblast occupies only the 33rd place in the national rating and meets only the median level of SM (SM index is 63), while the Moscow Oblast – 3rd place (SM index is 84). In the first case, a lot of efforts will be required to increase the level of SM, namely:

– to increase the share of expenditures on research and development (R&D) in GRP (2–2.5 times);

– to increase the number of scientists and engineers, fully engaged in R&D per 10 thousand population (2–2.5 times);

– to increase the number of the country's residents, who have filed patent applications, by 1 million people (6–8 times);

– to increase the number of personal computers per 100 households (2 times);

– to increase GRP per capita (4–5 times);

– to increase of GRP per capita at purchasing power parity (2.5–3 times);

– to reduce the share of value added in the material sphere (2 times);

– to reduce the share of persons employed in the material sphere (1.5–2 times).

Since integrated modernization is a coordinated interaction of both stages, the rating of Russia's regions in many respects corresponds to their distribution in the two previous cases.

Table 5. Hierarchy of the levels of secondary modernization of Russia's regions (2010)

| Level | Low | Median | | | High |
|---|---|---|---|---|---|
| | | Below median | Median | Above median | |
| Index | 30–50 | 51–60 | 61–70 | 71–80 | Over 81 |
| Federal District | – | Southern (59)<br>North-Caucasian (54) | Ural (66)<br>Volga (64)<br>Siberian (63)<br>Far Eastern (62) | Northwestern (79) | Central (84) |
| Number of RF regions | 3 | 38 | 30 | 9 | 4 |

Source: compiled by the author with the use of information-analytical system of monitoring the parameters of Russian regions' modernization (IS "Modernization", patent No. 2012661285, 2012), in accordance with the methodological developments of the Centre for the Study of Social and Cultural Change of the Institute of Philosophy of RAS.

The Central and Northwestern federal districts became leaders again, reaching the average level (interval from 64 to 77) by 2005 and 2008, respectively. Starting from 2009, Russia is complying to this standard, and the other 6 federal districts (Ural, Far Eastern, Volga, Siberian, Southern, North-Caucasian) – to a level below average (interval from 48 to 63).

The definition of the phase of Russia's primary modernization shows that in 10 years it has increased by 0.5, shifting from a phase of maturity to the phase of transition to the secondary modernization. Three more federal districts have the values similar to the national ones, however, their SM-phases are significantly differentiated: from 1.5 in the Central FD to 0 in the Ural FD. The national values and the values in the Northwestern FD are equal to 1, this corresponds to the starting phase. However, not all the federal districts made such a leap, a large part of them (Far Eastern, Volga, Siberian, Southern, North-Caucasian FD) are in the phase of maturity, i.e. primary modernization has not yet entered a phase of transition to the secondary modernization. A relatively high employment in agriculture, which does not comply with the standards of industrialized countries in the early 1960s, is a limitation impeding the onset of this phase.

*Modernization level in the regions of the Northwestern Federal District*

For obtaining a more detailed picture of modernization in the regions within the Federal District let us study and compare the level of primary, secondary and integrated modernization in the regions of the Northwestern Federal District. The index of primary modernization of NWFD has increased by nearly 8% for 10 years, and in 2010 it was 99.7 that corresponds to the second place in the general rating of Russia's federal districts (the Central Federal District occupies the first place). By 2010, nine out of ten accounted indicators of PM have been realized by 100% in the district in general. Full implementation (achievement of 100%) is impeded by an insufficiently high life expectancy (LE) of population (mainly due to the mortality of working-age men). A similar situation is observed in the Murmansk Oblast. In the Vologda, Kaliningrad, Novgorod, Pskov oblasts and in the Republic of Karelia the limiting factor, besides LE, is low income per capita. The constraining factors in the Arkhangelsk, Leningrad oblasts, Nenets Autonomous Okrug and the Komi Republic are low life expectancy and a high share of value added in the services sector with regard to GDP (below 45% by the standards of PM). It is not until 2020 that these "hindrances to modernization" will be possible to eliminate, even with great effort. Saint Petersburg is the only territory, which has already achieved full implementation of PM by 2008.

Eight subjects of the district experienced a decrease in the PM indices by 0.1–0.7 units in 2010 compared with 2009. It should be noted that growth rates of the index, given its low values, in a number of regions (Pskov Oblast, Republic of Karelia, Nenets Autonomous Okrug) are also low. For example, the 'outsider' region, Nenets Autonomous Okrug, has the PM index equal to 92, and its growth for 10 years was only 1 point. If current trends are maintained, the speedy completion of this stage of modernization will be problematic, which can be seen from the forecast calculations (according to the inertia scenario, *tab. 6*).

While analyzing the NWFD regions, we should point out that another five territories have the median level of SM, the first region (Murmansk Oblast) is above the median level, Saint Petersburg has the high level, and the three regions of the Federal District have the level below median *(fig. 2)*.

The positive dynamics of the NWFD regions in the period from 2000 to 2010 is obvious; all the territories have enhanced their level of secondary modernization. As a result, five regions (Republic of Karelia, Arkhangelsk, Novgorod, Vologda, Pskov oblasts) recovered from the low level, and first approached the

Table 6. Prospects for the modernization of the regions in the Northwestern Federal District

| Indicator | Fact | | | | Forecast | |
|---|---|---|---|---|---|---|
| | 2000 | 2005 | 2008 | 2010 | 2015 | 2020 |
| Number of regions that implemented PM by less than 99% | 11 | 11 | 6 | 7 | 4 | 3 |
| Number of regions that implemented PM by 99% | – | – | 4 | 3 | 5 | 5 |
| Number of regions that implemented PM by 100% | – | – | 1 | 1 | 2 | 3 |

Source: author's calculations with the use of information-analytical system of monitoring the parameters of Russian regions' modernization (IS "Modernization", patent No. 2012661285, 2012), in accordance with the methodological developments of the Centre for the Study of Social and Cultural Change of the Institute of Philosophy of RAS.

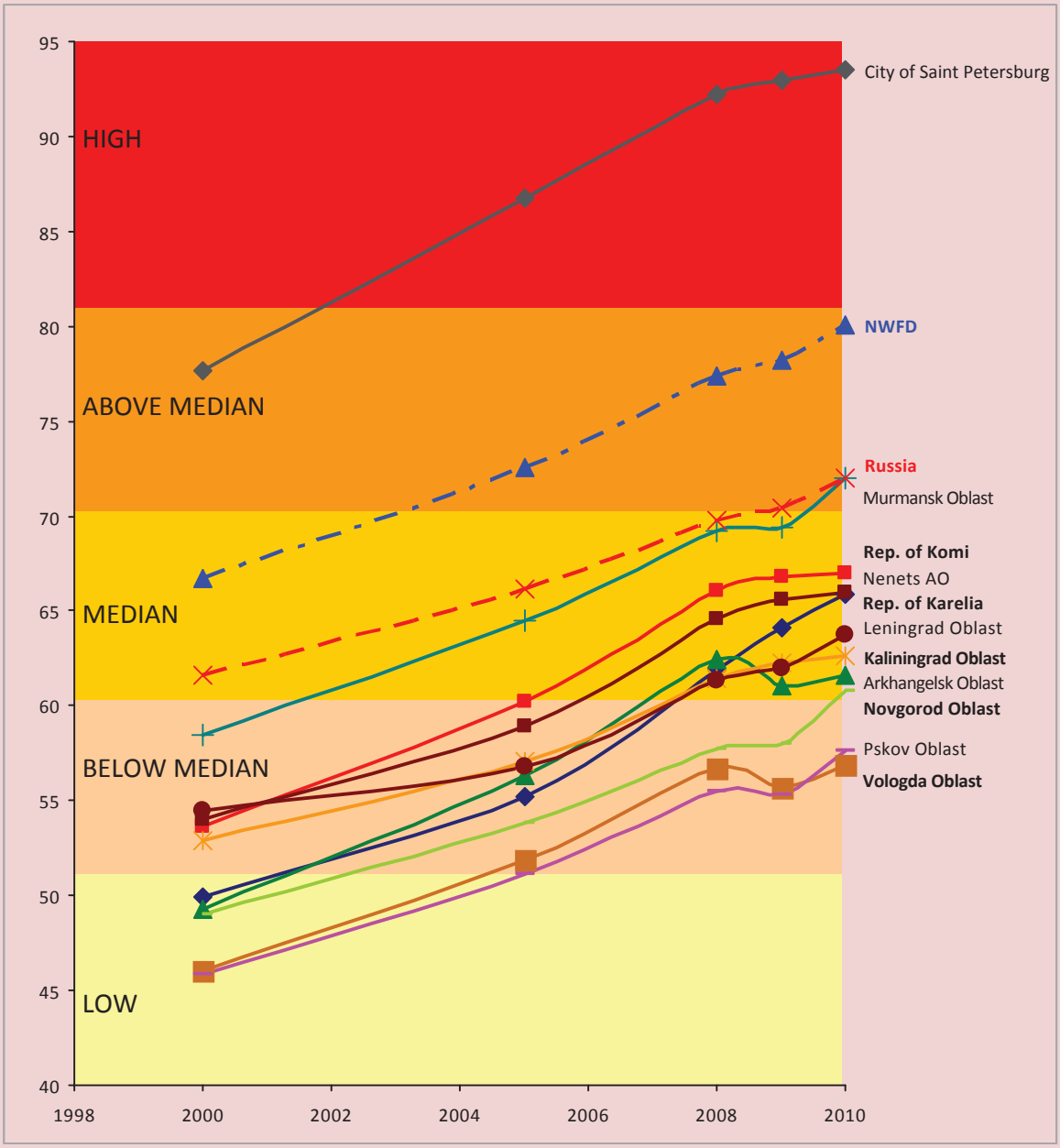
level below median (2005); and in 2010 three of them (Republic of Karelia, Arkhangelsk, Novgorod oblasts) corresponded to the median level. Over the period of ten years two regions (Leningrad Oblast, Komi Republic) have reached the median level and the Murmansk Oblast has reached the level above median out of the level below median. Only the Kaliningrad Oblast, despite its positive dynamics, remains below the median PM-level from year to year. Saint Petersburg stands out significantly among all the territories: no other NWFD region was able to reach the level that the city had in 2000. This difference is ensured by a high index of innovation in knowledge that 3–12 times exceeds the indicators in the other regions.

A phase of modernization (primary and secondary) is of fundamental importance. According to the methodology that we use, the phase of SM can be defined only provided that the territory enters the transitional phase of PM. In 2000, NWFD on the whole and another 5 subjects corresponded to the phase of transition to SM, however every year their number was reducing, and by 2010 three regions have remained *(fig. 3)*. Such trends can be explained by the increase in the ratio of value added in agriculture to GDP, which should be less than 5%, and also by the increase in the rate of employment in agriculture (less than 10%). Thus, only the Komi Republic and Arkhangelsk Oblast, as well as NWFD as a whole, were in the preparatory phase of SM by the end of the analyzed period, Saint Petersburg was in a more advanced phase, i.e. in the phase of development.

A slight positive dynamics can be observed in the index of integrated modernization in NWFD in the 2000–2010 period: its value has increased from 59 to 71, which corresponds to that in the countries with a medium level of development (interval from 53 to 83). Of the three groups of parameters of this indicator, the situation is least favorable in economic sphere (index is 56%). However, upon considering regional modernization in detail, we can point out that the index of knowledge transmission is the smallest (from 41 to 59) in all the territories except for Saint Petersburg (93). Such dissonance results from the fact that the share of R&D expenditures in GRP in Saint Petersburg is rather significant, and the number of people applying for patents (per 1 million people), is 6–13-fold greater than that in the neighbouring regions.

For the majority of constituent territories of NWFD (except for Saint Petersburg) the major factors constraining modernization are low GRP and the low level of research and innovation. Intellectual development, scientific development, the preservation and enhancement of the elements of innovation infrastructure become critically important in modern conditions. In this respect significant importance is attached not only to quantitative characteristics (for instance, if the Vologda Oblast intends to reach the level of the leader, the Murmansk Oblast, it should enhance the performance of R&D in 5–10 times), but also to the qualitative parameters of the Vologda Oblast's R&D sphere: the degree of knowledge intensity of research institutions, the quality of fundamental and applied research [8].

Figure 2. Trends in the dynamics of secondary modernization indices in the regions of the RF Northwestern Federal District

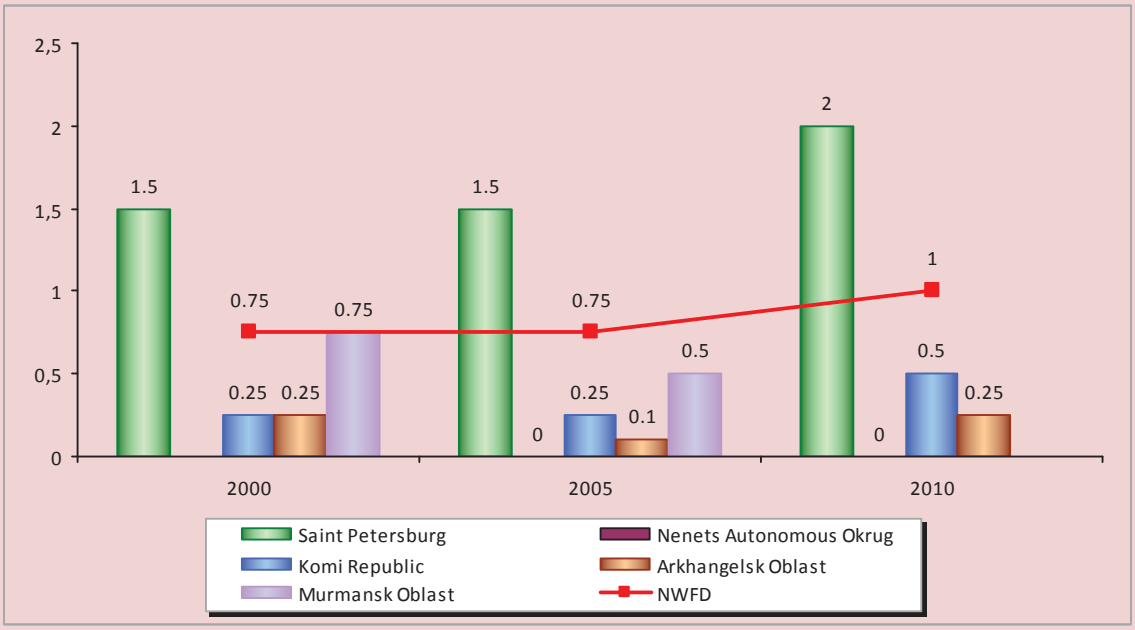



Source: compiled by the author with the use of information-analytical system of monitoring the modernization parameters of Russia's regions (IS "Modernization", patent No. 2012661285, year 2012), in accordance with the methodological developments of the Centre for the Study of Social and Cultural Change of the Institute of Philosophy of RAS.

The intentions to implement new mega-projects should make a powerful impetus in the leading branches of the oblast's industry: mechanical engineering, metallurgy, wood processing, as well as in research institutions [9].

The strategy for the development of the Vologda Oblast should be based on the principle of growth and concentration of scientific knowledge, and production capacity as well, in the most promising spheres, which form the centres of socio-economic efficiency [15].

Figure 3. Phases of secondary modernization of the territories in the Northwestern Federal District, which have achieved the transition phase of primary modernization




Source: compiled by the author with the use of information-analytical system of monitoring the modernization parameters of Russia's regions (IS "Modernization", patent No. 2012661285, year 2012), in accordance with the methodological developments of the Centre for the Study of Social and Cultural Change of the Institute of Philosophy of RAS.

The pace and orientation of innovation modernization in the Murmansk Oblast, where the industrial sector is formed by several large and medium-sized resource corporations, largely depend on the internal corporate policy. Here the success of innovation modernization depends on the joint actions of local authorities and business community. Financial resources for innovation modernization are the scarcest in the regions-recipients of financial assistance from the federal budget. Therefore, they should efficiently use the potential of Russian and international development institutions to implement the process of intellectual transformation of economic system [10]. It is necessary to create the programme for the development of Northern regions in the era of knowledge economy, which would be facing the challenges of innovation development, facilitate the exchange of information and knowledge within NWFD, between the centre and periphery.

Thus, all the constituent territories of NWFD (and Russia, for sure) have similar barriers, consisting in the low level of innovation modernization. Regional policy should be aimed first and foremost at creating conditions for extensive cooperation of regions in the development of territories, for working out the solutions to common problems and for the implementation of joint projects [10]. In order to succeed in the formation of innovation economy it is necessary to establish a national innovation system of institutions, social practices, strengthening the achieved results and creating the actual opportunities for moving along the innovation-driven path of development. In this case, it is possible to overcome the main obstacle, consisting in the absence of qualified managers rather than in the lack of finance, through the joint work of scientists, entrepreneurs, innovators and representatives of power.

Modernization is a strategic task of national and regional development. As the analysis shows, all the NWFD regions are lower than the national trend, except for Saint Petersburg, which on its own "pulls" the federal district to the position above the national average level. The shift from PM to SM should become the main principle of modernization of the NWFD constituent territories in the coming years. It is natural to assume that even the neighboring territories would require different time-frames for achieving it. Innovation, knowledge and human resources should become the main sources of energy, which should help in a difficult competition of the regions in the implementation of modernization [6]. Russia's regions require the mixed-type modernization with efficient application of advanced foreign achievements and opportunities of national research and innovation potential.

*Conclusion*

The evaluation of modernization carried out in this study for each region and federal district of Russia shows that

– modernization processes in the country's regions are going on very unevenly;

– primary modernization in most of the territories has been carried out by 95–99%;

– major difficulties are associated with secondary and integrated modernization. In these kinds of modernization the processes of economic and cultural-cognitive modernization are the weak spots.

Given the basic factors of Russia's spatial development, the prospects of socio-economic transformation in Russia's regions will have inertial character. There will be no rapid changes in the next decade due to the fact that the priorities of regional policy have not been established yet. The same territories will remain points of growth (Moscow, Saint Petersburg, the leading regions of the fuel and energy complex); they currently occupy a leading position in the spatial modernization of Russia. The numerous group of regions with a medium level of development will remain, with a possible slight movement up or down. Underdeveloped constituent entities of the Russian Federation will be a burden to the country's budget. In general, the inequality among the regions will increase. Investments in more developed areas will facilitate the modernization development of Russia as a whole. The problems of lagging regions should be solved not only by stimulating regional policy, but primarily by social policy aimed at enhancing human capital.

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# Region management in terms of sustainable development*

*The article considers the approach towards the improvement of the management of regional development, which is based on determining the character and direction of the influence of a number of factors on regional development by applying the method of principal components. The approbation of the suggested approach to the statistical data of Russian regions for 2000–2010 in terms of the region's major subsystems indicated the absence of progressive development tendencies, as well as made it possible to determine the character and the direction of the influence of the investigated factors, which in the regional management practice permit taking the regions to the sustainable development pathway, to be determined.*

*Sustainable development, safe and balanced development, regional development management, method of principal components, vector of generalized influence, vector of development, factors of regional efficiency.*

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The intensification of globalization processes, growth of cross-country and interregional competition, combined with increasing constraints on further development as a consequence of the accumulated economic, environmental and social issues, determine the necessity of transferring Russian regions to the sustainable development pathway.

The main requirement of such transition is to improve the system of territorial management, focused on the achievement of the main development goal – survival of the region, the enhancement of its viability.

Despite apparent simplicity, there are many interpretations of the term "sustainable development".

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Classical understanding of "sustainable development", was suggested in the 1987 report "Our common future", where it was defined as "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [7, p. 50].

According to A.P. Tyapukhin and A.T. Raimova, "sustainable development" is "socio-economic and ecological development, aimed at the maintenance of peace on the planet, reasonable satisfaction of human needs with the simultaneous improvement of the living standards of the present and future generations, careful resource management and the preservation of natural environment" [11, p. 21]. T.V. Uskova defines the sustainability of socio-economic system as its ability to function and develop steadily in the long term [12].

In the Macmillan Dictionary of Modern Economics sustainable development is understood as "maximization of net profits from economic development, while preserving natural resources... The latter is understood by the economists – proposers of the theory..., as the use of renewable natural resources with the intensity, not exceeding the regenerative capacity of the resources, and the use of non-renewable resources with optimal efficiency, which implies the substitution of the use of natural resources with the technological progress" [9, p. 481].

According to V.A. Koptyug, the concept of sustainable development "suggests the achievement of the rational equilibrium of social-economic development of humanity and the preservation of the environment, as well as requires a sharp decrease in the economic disparity between advanced and developing countries by means of both technological process and the rationalization of resource use" [6].

It is necessary to highlight the evolution of ideas concerning the category "sustainable development" from the concept interpretation in terms of environmental aspects and the need to ensure the reproduction of limited renewable and non-renewable resources to the consideration of sustainability mainly from the perspective of its socio-economic aspects.

The authors are more familiar with the concept of O.K. Tsapieva that considers balanced, safe and efficient development, providing the achievement of the set goals and priorities of social, environmental and economic issues to be the main imperative of sustainable development [13].

Understanding the essence of sustainable development from the perspective of safe and balanced development of the region's major subsystems – economy, ecology, social sphere – improvement of the system of regional development is to be carried out taking into account the ratio of output development parameters of the region's basic subsystems (economic, social and environmental) and some extremely critical values, on the one hand, and the fulfillment of the requirement of development of these subsystems on a parity basis, on the other hand.

The parameters of safe development, defined on the basis of the indicators rather widely used at present [1, 5, 8], suggests that the development of Russian regions for a long time have been carried out beyond its critical limit values *(tab. 1)*.

With regard to balanced development, it should be noted that at present this kind of record is not sufficiently developed in regional studies, which determines the relevance of the topic development.

While the use of critical limit values of indicators in the practice of regional management allows the fixed estimate of the development of various subsystems as components of the regional systems to be obtained, the assessment of the regions' state in terms of balanced development provides not only the identification of the equitable development of

Table 1. Correspondence of the indicators of socio-economic development of the Russian Federation with the critical limit values

| No. | Name of indicator | Indicator | 2000 | 2011 |
|---|---|---|---|---|
| 1. | Volume of capital investments, as a percentage of GDP | 25.0 | 20.25 | 23.81 |
| 2. | Depreciation of fixed assets, % | 40.0 | 43.5 | 46.3 |
| 3. | Share of machine-building in the industry, % | 25.0 | 20.5 | 14.0 |
| 4. | Share of manufacturing sectors in the industry, % | 70.0 | No data | 65.1 |
| 5. | Share of unprofitable enterprises, % | 25.0 | 39.8 | 30.0 |
| 6. | Production profitability, % | 15.0 | 18.9 | 9.6 |
| 7. | Return on assets, % | 12.0 | 7.6 | 6.5 |
| 8. | Inflation rate, % | 15.0 | 20.2 | 6.1 |
| 9. | Monetization rate M2 at the year-end, as a percentage of GDP | 50.0 | 11.98 | 35.86 |
| 10. | Overall external debt, as a percentage of GDP at the end of the year | 25.0 | 61.67 | 31.20 |
| 11. | Share of foreign capital investments, % | 25.0 | 26.48 | 55.05 |
| 12. | Ratio of the volume of foreign trade turnover, as a percentage of GDP | 30.0 | 57.78 | 43.15 |
| 13. | Share of innovation enterprises, % | 40.0 | 8.8 | 10.4 |
| 14. | Share of innovation, % GDP | 3.2 | No data | 6.3 |
| 15. | Expenditures on research activities, as a percentage of GDP | 3.0 | 0.24 | 0.56 |
| 16. | Share of public environmental expenditures, as a percentage of GDP | 5.0 | 1.47 | 0.74 |

these subsystems, but also the focus and nature of changes occurring in the region under the influence of various factors.

A region is a complex socio-economic system, the development of which is a multi-dimensional and multifaceted process of multidirectional character. A priori the category "development" is identified with positive orientation changes. Nevertheless, the development can be positive (progress), negative (regress), stagnant (slack). In fact, the progress in certain areas is often combined with regress or stagnation in others. Jointly these processes form the so-called vector of regional development, reflecting the cumulative result of the current regional trends, the direction and extent of which depend on the results of the development of its subsystems.

As the development and activities of regions are affected by many factors of the internal and external environments, the improvement of the regional management system suggests the identification of factors affecting the processes, the nature and extent of their influence, to be considered as a matter of high priority.

According to the concept of development stages, each stage has its own set of factors, mainly ensuring the development [10, p. 114-115]. Thus, territorial systems located at the first stage, develop due to production factors, primarily unskilled labour and natural resources. The territorial development at this stage depends primarily on well-functioning public and private institutions, adequate infrastructure, macroeconomic stability, and healthy and literate workforce.

The income level of population has been increasing in the process of economic development, so the territories move on to the next phase, in which the development is primarily provided by efficiency, more efficient production processes, quality improvement of products (services). At this stage the development is increasingly determined by the quality of human capital – level of secondary and higher education and training, the availability of effective market mechanisms, well-functioning labour market, developed financial markets, the large size of the domestic and foreign markets, as well as the ability to use the existing

technologies with the maximum benefit. And finally, the transition of territories to the third stage implies the possibility of its support at the expense of innovation activity, production of new unique products (services) with the use of modern production technologies.

In terms of sustainable development this concept needs to be adjusted considering the following circumstances: firstly, the objectively existing limited resources condition the requirement to use the resources efficiently in order to maximize the ability of systems to exist at all stages of development, and secondly, the need to ensure a balance between economic growth, social justice and environmental security [2, 3].

Traditional approaches of correlation-regression analysis and econometric modeling, applying multiple regression methods for establishing interrelation between endogenous and exogenous variables are widely used, when solving the task of identifying the determinants of regional development. However, the use is complicated, on the one hand, by the limited possibility of actually identifying the independent variables, due to the fact that, as a rule, all of the factors characterizing the complex socio-ecological-economic systems, are closely related to each other, and on the other hand, by wider range of issues, resolving which is impossible, if using the above methods. An example of such problems is the task of determining the degree of influence of each considered factor on the whole system, provided that the resulting factor (or factors) is (are) not selected.

In this regard, it seems productive to use the method of principal components (MPC), which allows examining the impact of the analyzed factors on the total dispersion within the framework of the comprehensive analysis of the variability of multifactor structures. The MPC essence consists in the transition from the system description, applying a great number of measured characteristics, to the description with the use of less variables, representing the most informative system attributes. In other words, the application of MPC allows reducing the dimensionality of the original data. Taking into account the complexity of regional systems, it is this MPC feature that allows determining the effect of each factor on the overall changes in the system, providing for the consideration of a significant number of panel data. In compliance with MPC, the linearly independent combination of the most significant factors is the first major component, the combination of factors of secondary importance is the second principal component, etc.

The authors suggest an approach that, as opposed to the classical interpretation of the results of MPC application, allows considering the influence of all identified linear independent combinations of total factors (principal components) in the first place, and of each individual factor in the second place, exerted on the process of the development of a complex dynamic system that is the region.

In case the system state is described by n factors, the number of all principal components is also n, and each *i*-th principal component is of the form:

$$a_1^i x_1 + a_2^i x_2 + \ldots + a_n^i x_n,\ i = \overline{1,n}. \quad (1)$$

Thus, the influence of each *j*-th factor in all of principal components characterizes the values $\{a_j^i\}$, $i = \overline{1,n}$, $j = \overline{1,n}$. It is necessary to introduce the consideration of some aggregate, in order to record the generalized influence of each j-factor in all principal components: $b_j = f\left(a_j^1,\ldots,a_j^n\right)$, $j = \overline{1,n}$.

It is known that each *i*-th principal component (1) contributes to the total variance of the system $\lambda^i$, at that $\sum_{i=1}^{n} \lambda^i = 1$. Thereupon, these values can be also interpreted as the relevant characteristics of the influence, exerted by individual factors.

This interpretation allows calculating the generalized influence of each factor as the weighted average:

$$b_j = \lambda^1 a_j^1 + \lambda^2 a_j^2 + \ldots + \lambda^n a_j^n,$$
$$j = \overline{1,n}. \quad (2)$$

Thus, it is possible to determine a vector, which is the vector of generalized influence of factors, whereas each component of the vector is the effect of a particular factor.

In turn, it is necessary to determine the character of regional development by logic of balanced development, in terms of economic aspects, and its social and environmental characteristics as well. In other words, regional development can be identified with a certain vector, the size and position of which in the spatial coordinate system will make it possible to interpret the character of the region's development and balance as a whole not only quantitatively, but visually as well. Such vector is suggested to be considered as the generalized vector of the factors' influence. A hypothetical vector, adopted as standard, the components of which are approximately the same, can be taken as the guideline, relatively to which the region's development is identified as positive or negative, i.e. characterizes situation, in which all the considered factors exert approximately the same influence on the examined system. In the given study the vector, exerting equal impact on the constituent components was adopted as a reference vector, which will be henceforth called the vector of balanced influence.

In terms of the proposed approach the formalized representation of the character of regional development can be obtained by applying the following criteria:

– module of the generalized vector of the factors' influence at a fixed point in time (hereinafter Cr 1) as the characteristic of its absolute value (the higher the absolute value of this vector, the greater is, obviously, the factors' influence on the system);

– angle between the vectors of generalized and balanced influence (hereinafter Cr 2) (the smaller the angle, the more the actual influence of factors corresponds to the standard, i.e. balanced one).

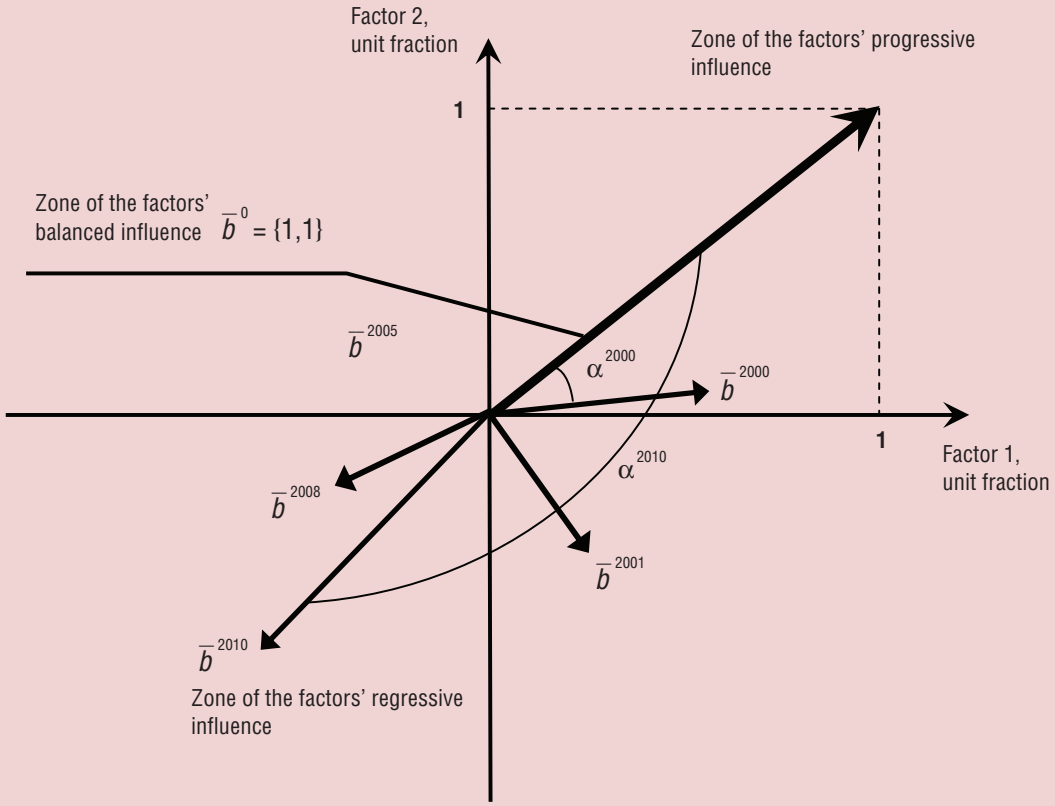
The selection logic of the above mentioned criteria can be illustrated on the example of the dynamics of the hypothetical vector of the generalized influence of two factors *(fig. 1)*.

The range of possible positive or negative values of the vector of the generalized influence determines the zone of progressive or regressive influence of the analyzed factors, respectively. The situation, presented in figure 1, shows the gradual shift of the generalized influence of the factors ($\bar{b}^t$) from the progressive zone to the regressive zone of influence, accompanied by its strengthening, over the 2000–2010 period. This is proved by the increase in the values of both criteria – the angle between the vectors of the generalized and balanced influence ($\alpha^{2000} < \alpha^{2010}$), and the vector of the generalized influence of the factors ($\left|\bar{b}^{2000}\right| < \left|\bar{b}^{2010}\right|$).

With regard to earlier conducted studies [4], it seems reasonable to consider the factors influencing the regions' development, factors of regional efficiency as the factors, determining the development of Russian regions at the present stage. The system of indicators was constructed mostly in the format of the results – costs grouped by regional subsystems (social sphere, economy, ecology, financing and management). According to the authors, the system of indicators provides the opportunity for the objective characteristics of the produc-tivity of available resources and can be used as the basis for analyzing balanced regional development.

Taking the above statements as the basis for identifying the factors, determining the balance of regional development, the authors formed the system with 33 indicators, including partial indicators, characterizing the efficiency of the use of certain types of resources (labour, investments, fixed assets), the efficiency of

Figure 1. Dynamics of the hypothetical vector of the generalized influence of factors $\bar{b}^t$ in 2000–2010




budget spending in the social sectors, the functioning efficiency of these industries, of the environment, the efficiency of the activities of the public control and administration authorities, the indices of living standards and life quality of the population.

The panel data of regional efficiency for 2000–2010 throughout the regions of the Russian Federation serve as the information base for testing the offered approach. The results of applying the above approach allowed determining the absence of progressive trends in the development of Russian regions, as evidenced by the growth of the development imbalance and decreasing value of the module of the vector of the generalized influence of factors *(fig. 2)*.

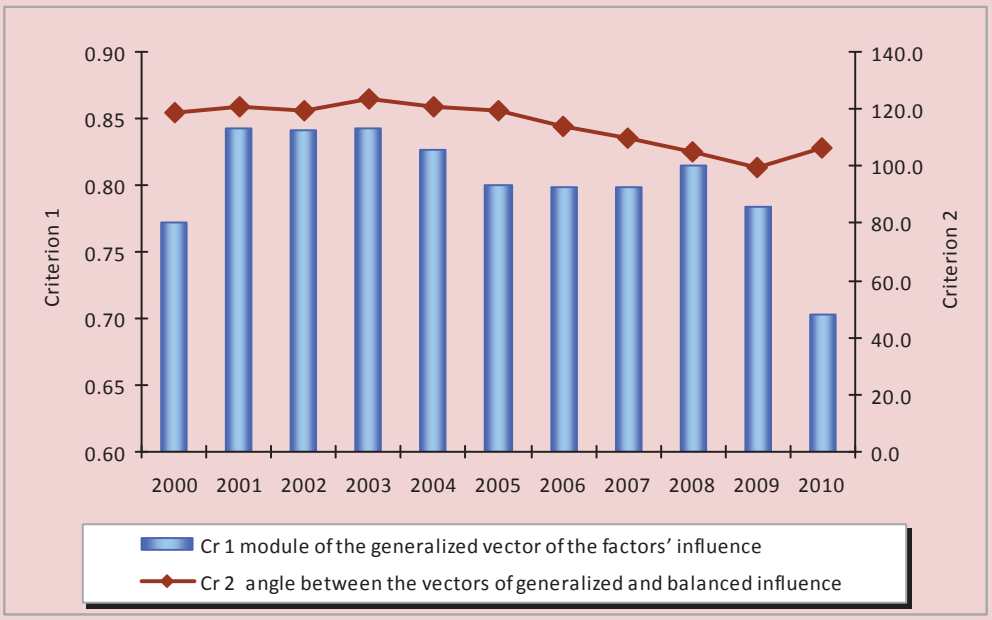
Given that the values $b_j$, $j = \overline{1,n}$ characterize the generalized influence of the *j*-th factor on the system as a whole (that is, on all principal components), it is reasonable to analyze the set of values $\{b_j^{t_1}, \ldots, b_j^{t_k}\}$, suggested to be considered as vector one, in order to assess the impact of each factor separately at a fixed point in time *t* and on the basis of the obtained information to determine the nature and extent of the influence on the regional development process in the time interval $[t_1, \ldots, t_k]$.

Then the generalized influence of the *j*-th factor on the system in the dynamics is characterized by the vector $\bar{b}_j\big|_{[t_1,\ldots,t_k]} = \{b_j^{t_1}, \ldots, b_j^{t_k}\}$ and:

– the longer the length of the vector, the more significant is the influence of the corresponding factor;

– the more frequent is the change of the digit in the vector's components $\bar{b}_j\big|_{[t_1,\ldots,t_k]}$, the more unstable is the influence of the *j*-th factor, determining it;

Figure 2. Dynamics of the balance of the development of Russia's regions regions in 2000–2010




– the more positive/negative components the vector $\bar{b}_j\big|_{[t_1,\ldots,t_k]}$ has, the more frequent is the positive/negative contribution of the *j*-th factor to the principal components, and consequently, its positive/negative influence on the system as a whole.

In this connection, the following criteria have been applied in the study, in order to determine the extent and nature of the influence of the factors of regional development: the vector of the generalized influence of the factor $\bar{b}_j\big|_{[t_1,\ldots,t_k]}$, the number of the turning points of the vector of the factor's influence (number of changes of the digit in the components of the vector $\bar{b}_j\big|_{[t_1,\ldots,t_k]}$) and the share of the positive/negative influence of the factors (percentage of positive/negative components of the vector $\bar{b}_j\big|_{[t_1,\ldots,t_k]}$).

In order to interpret the results of the calculations, the encoding of regional rating is introduced in the study. It represents a visual assessment of the influence of the considered factors, on the examined system.

The assignment of the three-symbol code to each factor was carried out on the basis of the calculated values of the above criteria *(tab. 2)*.

As the shares of the negative and positive effects of the factors total 1, the value of the second symbol of the rating 'C" automatically indicates a high proportion of the positive influence of the factor. The third symbol of the rating ("+" and "–") reflects the sustainable character of the influence of the analyzed factor on the regional system. In accordance with the above logic, the typologisation of regional rating in terms of of the degree of the factor's negative influence on the balanced development is suggested to be carried out the following way *(tab. 3)*.

Thus, the diagnostics of the influence of factors on the development of regional systems contributes to unbiased sampling and substantiation of a set of measures aimed at leading the regions to the path of balanced development. Depending on the calculated parameters of the influence, the extent, character and sequence of the developed measures are determined, in compliance with the introduced verbal scale –

Table 2. Encoding of regional rating

| Code symbol number | Criterion | Variation range of the criterion value | Code symbol value | Degree and character of the negative influence of the factors on the balance of regional development |
|---|---|---|---|---|
| 1 | Module of the vector of the factor's influence | 0.581–0.797 | A | High |
| | | 0.365–0.580 | B | Medium |
| | | 0.147–0.364 | C | Low |
| 2 | Share of the factor's negative influence | 0.500–1.000 | A | High |
| | | 0.201–0.499 | B | Medium |
| | | 0.000–0.200 | C | Low |
| 3 | Number of turning points | 0–4 | + | Stable |
| | | 5–10 | – | Unstable |

Table 3. Matrix of the degree of the influence of the factors on the balanced regional development

| Vector module of the factor's influence | | Share of the factor's negative influence | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| | High | AA+, AA– | AB+, AB– | AC+ |
| | Medium | BA+, BA– | BB+, BB– | BC+ |
| | Low | CA+, CA– | CB+, CB– | CC+ |

from priority neutralization of the factors, having a considerable negative effect on the development of regional systems (with the rating AA+, AA, AB+, AB, BA+, BA), to support measures in case of positive (CC+, BC+CB+CB–) or implicit (neutral) (CA+, CA, BB+, BB–AC+) impact.

The results of the calculations allowed performing the detailed analysis of the influence of the considered factors on the system and assess their significance from the position of ensuring the balanced development and overcoming the negative development trend of Russian regions (tab. 4).

The factors, negatively affecting the subsystem "Economy" include the following: labour productivity, capital productivity and the share of export in GRP with the negative impact share constituting 1.00 (AA+, BA+). This conclusion reflects the current situation of economic degradation in the country, its industrial and technological potential, functioning in the conditions of high degree of capital consumption, with little share of innovation technologies.

The second group of factors, positively affecting the development process include capital productivity, the share of gross fixed capital formation in GRP, the ratio of the volume of innovation products (works, services) to the expenditures on technological innovation (CB-, CB+).

Special attention should be paid to the factors of the management subsystem, that has negatively affected the development of regional systems (AA+) in 2000–2010, while developing measures aimed at the qualitative improvement of the system functioning.

According to the selected scheme, the group, positively affecting the subsystem "Demography" (CC+), includes the factors characterizing the efficiency of the physical reproduction of the population: "the ratio of the number of births to the number of deaths" and "the ratio of natural increase of the population to the amount of the expenditures from the consolidated budget of the RF subject on healthcare and social policy". At the same time the mechanical reproduction of the population, reflected by the migration gain ratio, characterized by the high share (0.909) and degree (0.427) of negative influence, extremely negatively affects the development of Russian regions.

Table 4. Factors, determining the development of the regions of the Russian Federation in 2000–2010

| № p/p | Indicator | Evaluation criteria | | | Rating | Verbal assessment of the factor's influence |
|---|---|---|---|---|---|---|
| | | Module of the influence vector | Number of turning points | Share of negative influence | | |
| 1. | 2 | 3 | 4 | 5 | 6 | 7 |
| | **Economic subsystem** | | | | | |
| 1. | Labour productivity, thousand rubles/person | 0.576 | 0 | 1.000 | BA+ | Negative |
| 2. | Capital productivity, rubles/rubles | 0.270 | 5 | 0.364 | CB– | Positive |
| 3. | Return on assets, rubles/rubles | 0.665 | 0 | 1.000 | AA+ | Negative |
| 4. | Share of gross fixed capital formation in GRP, % | 0.160 | 3 | 0.364 | CB+ | Positive |
| 5. | Share of export in GRP, % | 0.563 | 0 | 1.000 | BA+ | Negative |
| 6. | Ratio of the volume of innovation products (works, services) to the expenditures on technological innovation, rubles/rubles | 0.181 | 4 | 0.273 | CB+ | Positive |
| | **Subsystem of finance and management** | | | | | |
| 7. | Fiscal capacity, % | 0.185 | 4 | 0.273 | CB+ | Positive |
| 8. | Ratio of GRP to the number of employees of the public control and local administration authorities, billion rubles/person | 0.797 | 0 | 1.000 | AA+ | Negative |
| 9. | Ratio of the GRP to the non-excludable costs of the consolidated budgets, % | 0.695 | 0 | 1.000 | AA+ | Negative |
| | **Social subsystem** | | | | | |
| | **Demography** | | | | | |
| 10. | Ratio of the number of births to the number of deaths, % | 0.316 | 2 | 0.091 | CC+ | Positive |
| 11. | Migration gain ratio | 0.427 | 2 | 0.909 | BA+ | Negative |
| 12. | Ratio of natural increase of the population to the amount of the expenditures from the consolidated budget of the RF subject on health and social policy, people/thousand rubles | 0.205 | 2 | 0.091 | CC+ | Positive |
| | **Healthcare** | | | | | |
| 13. | Number of doctors and nursing staff, persons per 10000 people | 0.167 | 7 | 0.636 | CA– | Neutral |
| 14. | Ratio of the healthy to the number of doctors and nursing staff, people/people | 0.250 | 0 | 0.000 | CC+ | Positive |
| 15. | Ratio of the healthy to the amount of expenditures from the consolidated budget of the RF subject for healthcare, people/thousand rubles | 0.361 | 0 | 0.000 | CC+ | Positive |
| 16. | Ratio of the healthy to the amount of investments in fixed capital by the type of economic activity "Healthcare", people/thousand rubles | 0.372 | 0 | 0.000 | BC+ | Positive |
| 17. | Morbidity rate, persons/1000 people | 0.264 | 2 | 0.909 | CA+ | Neutral |
| | **Education** | | | | | |
| 18. | Ratio of graduates of specialized secondary educational establishments to the expenditures from the consolidated budget of the RF subject on general education, people/rubles | 0.244 | 3 | 0.364 | CB+ | Positive |
| 19. | Ratio of graduates of specialized secondary educational establishments to the volume of investments in fixed capital by the type of economic activity "Education", people/thousand rubles | 0.298 | 5 | 0.273 | CB– | Positive |
| 20. | Ratio of graduates of specialized secondary educational establishments to the number of population, % | 0.426 | 0 | 1.000 | BA+ | Negative |

End of table 4

| | | | | | | |
|---|---|---|---|---|---|---|
| | **Living standards** | | | | | |
| 21. | Actual final consumption of households to the number of the employed in the economy, thousand rubles/people | 0.651 | 0 | 1.000 | AA+ | Negative |
| 22. | Actual final consumption of households per capita, thousand rubles/person | 0.691 | 0 | 1.000 | AA+ | Negative |
| 23. | Share of actual final consumption of households in GRP, % | 0.487 | 1 | 0.182 | BC+ | Positive |
| 24. | Inverting indicator of the unemployment level, 1/% | 0.743 | 0 | 1.000 | AA+ | Negative |
| 25. | Total area of residential facilities per one citizen on average, square metres | 0.183 | 2 | 0.909 | CA+ | Neutral |
| 26. | Number of private motor-cars, units per 1000 people | 0.555 | 0 | 1.000 | BA+ | Negative |
| 27. | Retail trade turnover per capita, rubles/people | 0.786 | 0 | 1.000 | AA+ | Negative |
| 28. | Volume of paid services per capita, rubles/people | 0.727 | 0 | 1.000 | AA+ | Negative |
| | **Subsystem of ecology** | | | | | |
| 29. | Share of trapped air pollutants in the total volume of emissions of polluting substances into the atmospheric air, % | 0.234 | 0 | 0.000 | CC+ | Positive |
| 30. | Share of circulating and consistently used water in the total volume of fresh water, % | 0.183 | 5 | 0.727 | CA– | Positive |
| 31. | Ratio of GRP to the total volume of emissions of polluting substances into the atmospheric air, thousand rubles/t on | 0.542 | 0 | 1.000 | BA+ | Negative |
| 32. | Ratio of GRP to the volume of polluted wastewater discharges into surface waters, thousand rubles/cubic metres | 0.147 | 5 | 0.545 | CA– | Positive |
| 33. | Environmental capacity of the economy (use of fresh water to GRP), thousand rubles/cubic metres | 0.237 | 0 | 0.000 | CC+ | Positive |

The majority of the performance factors of healthcare and education subsystems affect the regional development positively (CC+, BC+CB+CB-) or implicitly (CA+, CA), highlighting the need for the implementation of measures supporting the development of human potential.

Less positive results were obtained, when analyzing the influence of the factors of the subsystem "Living standards". Thus, most of the factors of the living standards subsystem with ratings of AA+, BA+ point to their highly negative impact on the development of Russian regions, indicating the existence of significant constraints superimposed on the development of Russian regions in the result of reducing living standards and life quality of the population.

Under the existing level of industrial development, positive impact in terms of the balanced development of the factors, characterizing the subsystem "Ecology", is most likely ensured by reduced load on the environment as a result of reduced industrial activity, and not by the implementation of advanced environmental technologies.

Based on the presented data, the priority task of regional regulatory and administrative authorities for the switch of Russian regions to the path of safe and balanced development in the economic sphere is to improve the economic efficiency of the regions, especially with regard to increasing productivity.

Among the measures proposed to be implemented in the social sphere as a matter of priority, are the following: to counteract the tendencies of the demographic situation deterioration, depopulation, to develop migration policy, to assist the development and improve-

ment of the healthcare and education system, to restrain the wealth gap process, to create new and maintain old jobs. In the finance and management sphere the goal is to increase the efficiency of management apparatus bureaucracy as an important factor ensuring the development efficiency of split-level territories.

The implementation of measures contributing to the minimization of environmental damage and reduction in the natural resource intensity of the economy will facilitate the transition of the regions to the path of sustainable development in the sphere of ecology.

Thus, the consideration of the character and degree of the influence of various factors on the balanced development in the practice of regional management will allow increasing the validity of the adopted decisions in terms of the significance of achieving the priorities of not only economic development, but also, of socio-environmental development, which is especially important during the transition to post-industrial stage, while the monitoring of the critical limit indicators of regional development will allow the reliable information about the performance of the accepted decisions to be obtained.

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# The role of the fuel sector of subarctic regions in the Komi Republic economy*

*The article is devoted to the fuel and energy sector of the Pechora-Ural Arctic. It presents detailed information on six subarctic regions of the Komi Republic in the context of basic types of economic activities. Their role in the region's economy and Russia is defined. The crucial problems of their development are defined. The conclusion is made about the necessity of positioning the subarctic regions of the Komi Republic as a rear echelon of infrastructure support to develop the energy resources of the Russian Arctic zone, with a focus on the domestic sustainable development.*

*Barents/Euro-Arctic region, Pechora-Ural Arctic, fuel and energy resources, infrastructure.*

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**Introduction.** The Arctic zone of the Russian Federation is a powerful economic complex of mining enterprises, accounting for 60% of the share of added value from the worldwide Arctic zone (the remaining 40% fall on Greenland, Norway, Sweden, Finland, USA and Canada).

Oil and gas sector occupies the main place in the economy of Russia's Arctic zone with 80% and 65% of the country's total production respectively; mining complex (non-ferrous metallurgy, mining of diamonds, gold, bauxite, etc); six coal basins, three of which (Pechora, Lensky and South-Yakutsk coal basins) are under industrial development.

The urgent research task at this stage is to show the role of strategic economic activities of the Komi Republic in the support of the current and future development processes of the Arctic natural potential, through the conservation and use of the available production infrastructure, as well as the formation of new meridional connections across the North-South border. This approach is consistent with the Declaration on cooperation in the Barents Euro-Arctic region with regard to energy development on the basis of the principle of ecological validity, infrastructure modernization and new technologies [1].

Pechora-Ural Arctic (PUA) is the North-Eastern part of the Komi Republic comprising such urban districts as Vorkuta, Inta, Usinsk, and Pechora, Ust-Tsilemsky and Izhemsky municipal districts, economically interconnected by the Timan-Pechora oil and gas province, Pechora coal basin and transport communications (trunk oil and gas pipelines, railway). The fuel and energy sector is represented in all subarctic regions (SAR) with different concentration levels, determined by the dynamics of sectoral specialization: decreasing role of the old industrial areas of energy production, an increase in the transit of hydrocarbons from the neighboring regions, the emergence of new development zones *(fig. 1)*.

Extreme economic environment, harsh natural conditions, the local nature of economic development are typical in the PUA. Single-industry cities, rather large for the North, which comprise almost all of its demographic and production potential, are situated there. The rest of the area is difficult to access due to the lack of transport links within the region. It is slightly populated, and has underdeveloped industrial base.

30% of the population live in subarctic regions of the Komi Republic; it comprises 44% of the total gross municipal product, 25% of which is the extraction of fuel and raw materials, and only 1% falls on refining. Predominantly raw-material nature of the manufactured products is combined with the export and consumption of them mainly outside the Republic: coking coal – 100%, energy – 44%, oil, including gas condensate – 63% and oil products – 77%.

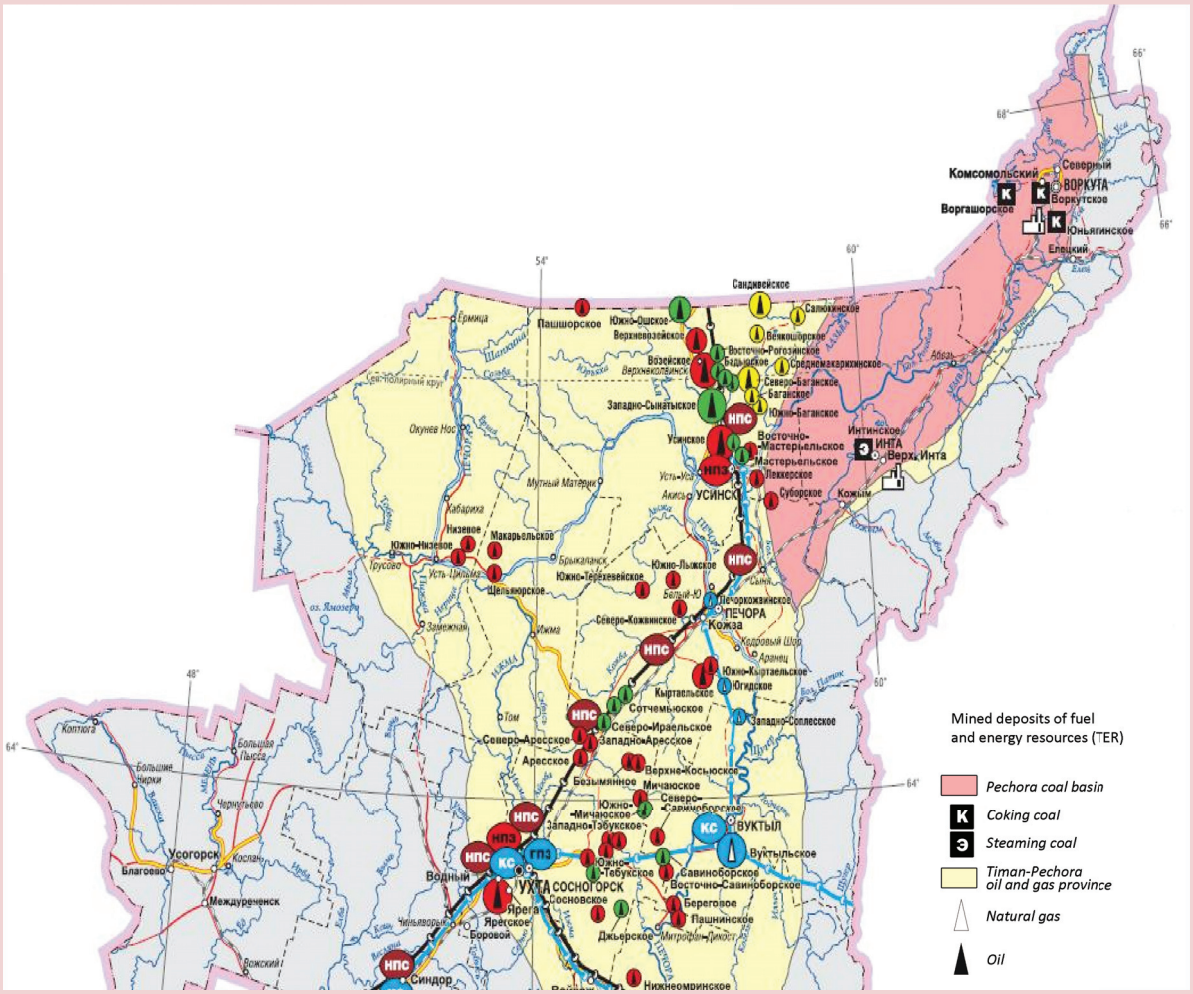
**SAR Characteristics**. The territories of each subarctic region, located within the boundaries of the Timan-Pechora oil and gas province and in the Pechora coal basin, have both open and potential hydrocarbons and coal raw material reserves [3].

***Oil and gas SAR:***

*1. Usinsk region*, which is the primary centre of oil production in the Komi Republic, providing more than 65% of the Republic's oil and about 15% of the gas. Considering the high degree of geological exploration of the initial total oil resources (over 77%) and the nature of localized objects (small and very small with hard to recover reserves), it can be noted that sustainable development of production is determined not by the extensive expansion of mineral resource base through greenfields, but by the intensification of works for oil recovery enhancement of producing fields and application of the newest mining technologies.

*2. Pechora region* is the second most important oil and gas extraction centre, annually producing 17% of oil and 20% of gas.

Figure 1. Fragment of the map of the fuel and energy complex of the Komi Republic within the subarctic boundaries [2]




The majority of deposits are in the initial and active stage of development, combined with a relatively low degree of exploration (29% for oil and 22% for gas) provides favourable opportunities for the development. Large volume of geological exploration and geophysical research is to be done in order to achieve the resource potential.

*3. Izhemsky and Ust-Tsilemsky regions* are new centres of oil production in the Republic, being at the earliest, pioneering stage of development. The industrial exploitation of several small deposits started only in 2001 and has no significant influence upon the regional economy so far. Despite several dozens of perspective oil-and-gas bearing structures, both regions are characterized by extremely low and unbalanced state of geological exploration, lack of infrastructure and remoteness from the existing centres of production, refining and transportation of hydrocarbons.

***Coal SAR:***

*4. Vorkuta region* – the main centre of coking coal production (Vorkutinsk, Vorgashorsk, Yun-Yaginsk deposits), providing 100% of their production in the Republic and 81% of the total coal mining in the basin. Pechora basin is characterized by insufficient resources development by industry. The distributed stock of coking coal in the operating mines

makes up only 8.1% of the resources of the categories $A+B+C_1$ for industrial development [4]. Moreover, the state fund of subsurface resources accounts for 12 promising oil and gas structures, some of which have been prepared for drilling.

Methane – the associated component of coking coal production, estimated at 2 trillion $m^3$, is the most important resource potential for the development of production of hydrocarbons in the region [5].

*5. Inta region* is the second largest region of coal extraction, producing power-generating coal (Intinskoye Deposit), the production of which reaches 19% of the total coal production of in the basin. The distributed stock in the operating mine makes up 4.2% of the resources of the categories $A+B+C_1$ for industrial development [4]. At the same time the region is characterized by insignificant amount of the current hydrocarbon production. It should be highlighted that due to fixed oil-and-gas bearing structures and extremely low degree of the territory's geological exploration (6% by oil and gas) the region maintains high potential for the discovery of new deposits, on the assumption of intensified regional geological surveying and geophysical works, increasing volumes of parametric drilling.

**Economic activity of the subarctic regions.** In the field of hydrocarbon extraction, transportation and processing of raw materials, the economic activity is characterized by the diversity of types and significant territorial differentiation. The generalized characteristics of the relative importance of individual branches of the fuel and energy complex and their impact on the economic development of the Pechora-Ural Arctic is presented in the work [6].

Three of the six SAR underwent significant changes over the past few years. Thus, the raw profile of the Usinsk region, which included a cycle of hydrocarbon production and transportation, was supplemented with processing: already operating gas processing plant (its main activity is the processing of associated petroleum gas: 35% of the recovery volume with stripped gas production, 0.2 thousand tons of liquefied gas and 3.8 thousand tons of stable natural gasoline) and the new oil refinery (0.7 million tons since 2011). The inevitable advancement of Russian vertically integrated oil and gas companies to the shelf of the Arctic seas can enhance the role of Usinsk as a major logistics center. However, the opportunity is yet rather hypothetical: firstly, the main players on the Arctic shelf are represented in the region only nominally, and the region itself is not crucial for them; secondly, it is necessary to consider the competitive factor of logistics centres, emerging in Arkhangelsk and Murmansk, and similar potential centre in Naryan-Mar. Regardless of the Arctic vector, the role of Pechora as the Northern traffic centre of the Komi Republic has been increasing.

At present, the commodity transport flows of the Northern and North-Eastern areas are concentrated in Pechora; the place is linked with the Southern, Ukhtinsk industrial-traffic centre linking the Nortwestern, Central and Eastern zones of the production activity on hydrocarbon extraction, transportation and processing. In the long view, the transit role of Pechora will be strengthening, in case the project on gathering and utilizing petroleum gas of the Northern deposits in Sosnogorsk gas processing plant is implemented successfully and the construction of the motor road Syktyvkar – Naryan-Mar is completed.

During the implementation of the gas-transport project "Yamal-Europe" the Vorkuta and Inta regions complemented their carbon cycles with the new one – natural gas transit and linear structures support. However, the development of the coal sector remains priority and city-forming for these regions.

The corporate policy of the owner of JSC Vorkutaugol is directed on improving the quality of commodity products due to the

increase in volumes and the improvement of processing technology in "Pechora" Central Concentrating Mill, the introduction of advan-ced equipment and technologies of coked coal extraction. Of special importance is the use of coked coalmine methane in the mini-CHP under construction with the capacity of 17.5 MW on the basis of gas-piston engines for electric and thermal energy production in "Northern" mine. At the moment Vorkutaugol enterprises have been already partially using the gas, emitted during coal mining in mine boilers.

The dynamics of the main fuel sector indicators in SAR of the Komi Republic for 2005, 2010, 2011 is presented in *table 1.*

***Coal.*** Coking coal, produced at JSC Vorkutaugol, is the most significant as per technological properties in Russia, and comparable in quality to the best world brands. Currently its technological properties are fully evaluated in the domestic market. In the long view with the introduction of pulverized coal injection technology the value of the Vorkuta coal for metallurgists will only increase.

The share of JSC Vorkutaugol in the production structure of coal concentrates of sintering basis of furnice-charge in Russia amounted to 22% in 2011, and the share in the home consumption structure (including import) made up 20%.

Output of major high-quality product (coal concentrate) in the period under review increa-sed 1.27 times regarding the coking coal, while energy coal output decreased to 62% from 2005-level.

Table 1. The dynamics of the main fuel sector indicators in Subarctic regions of the Komi Republic for 2005, 2010, 2011

| Indicator | 2005 | 2010 | 2011 |
|---|---|---|---|
| **Coal** | | | |
| Extraction, million tons in total | 12.94 | 13.56 | 13.4 |
| – coking | 8.82 | 10.82 | 10.9 |
| – power-generating | 4.11 | 2.74 | 2.5 |
| Coal-cleaning, million tons in total | 12.28 | 14.03 | … |
| – coking | 8.78 | 11.29 | … |
| – power-generating | 3.50 | 2.74 | 2.5 |
| Clean coal production, million tons in total | 5.36 | 6.21 | 5.94 |
| – coking | 4.04 | 5.38 | 5.12 |
| – power-generating | 1.32 | 0.83 | 0.82 |
| Clean coal deliveries, million tons in total | 9.18 | 12.35 | 9.44 |
| – Komi Republic | 1.36 | 2.78 | 2.06 |
| – other Russian regions | 7.23 | 7.99 | 6.39 |
| – export | 0.59 | 1.58 | 0.99 |
| – in million US dollars | 8 | 194.9 | 190.6 |
| Average export price of coal, US dollars/ton | 97.4 | 127.8 | 189.7 |
| **Oil** | | | |
| Extraction, million tons | 8.0 | 10.9 | 11.3 |
| Processing, million tons | – | – | 0.7 |
| Export | 4.0 | 5.3 | 5.5 |
| Average export price of oil, US dollars/ton | 340.0 | 543.5 | 556.0 |
| **Gas** | | | |
| Production, billion $m^3$ | 1.0 | 0.9 | 0.9 |
| Processing, billion $m^3$ | 0.3 | 0.2 | 0.2 |

Note. Compiled from [7]; oil export is estimated by experts, since official statistics gives the indicator without considering the basic exporter and without breakdown by districts.

The coal, produced by Vorkutaugol company is used as concentrate in metallurgy for coke production as the core component of furnace-charge, gas fat lean coal and fat mid-coal is used in heat and electric power industry.

The export and supply of Pechora coal out of the Republic amounted to 78%. It should be noted that coal export in dollar terms increased significantly due to the growth in coal export prices (in 2011 – 1.5 times, as compared to 2010 and 2 times, in comparison to 2005). This makes coal export especially profitable for the economy of coal industry.

OAO Severstal (Cherepovets Metallurgical Plant) is the main consumer of JSC Vorkutaugol coal products.

The consumers of Inta coal are energy enterprises and municipal households, located in the Northwestern and Central Federal Districts. The consumption of coal has been decreasing in the Arkhangelsk Oblast due to gasification, and it is being reoriented, in particular, to the Vologda Oblast consumers (Cherepovets TPP).

Most of the Pechora coal (95%) consumed in the Komi Republic, falls at the regions of its production: Vorkuta and Inta (CHP and mine boilers); not more than 5% is accounted for the rest of the Republic territory. Just as much coal is delivered from other Russian regions. The analysis of the economic indicators of SAR coal industry *(tab. 2)* showed that the transition to the development of only cost-effective reservoirs,

Table 2. Main economic indicators of the fuel sector of the subarctic regions of the Komi Republic

| Indicator | 2005 | 2010 | 2011 |
|---|---|---|---|
| **Coal** | | | |
| Average number of listed employees, thousand people | 13.6 | 9.3 | 8.8 |
| *Share in the total number of the employed in economy, %* | 2.9 | 2.0 | 1.9 |
| Average monthly wages of workers in the industry, thousand rubles | 17.1 | 38.8 | 45.7 |
| *Ratio to the average salary in the Komi Republic, times* | 1.47 | 1.48 | 1.58 |
| Fixed assets, billion rubles | 13.6 | 17.6 | 19.6 |
| *Share in the fixed assets of the economy, %* | 2.4 | 1.4 | … |
| Depreciation of fixed assets, % | 47.5 | 50.6 | 52.0 |
| Fixed capital investments, billion rubles | 2.5 | 1.5 | 5.5 |
| *Share in total fixed capital investments, %* | 5.3 | 1.4 | 3.0 |
| Balanced financial result, times to 2005 | 1.0 | 12.9 | 18.0 |
| Rate of return from sold goods, % | 27.5 | 45.7 | 59.1 |
| Expenditures per 1 ruble of products, rubles | 0.73 | 0.61 | 0.59 |
| **Oil and gas** | | | |
| Average number of listed employees, thousand people | 17.9 | 17.7 | 17.6 |
| *Share in the total number of the employed in economy, %* | 3.8 | 3.8 | 3.8 |
| Average monthly wages of workers in the industry, thousand rubles | 26.5 | 54.7 | 58.0 |
| *Ratio to the average salary in the Komi Republic, times* | 2.28 | 2.09 | 2.01 |
| Fixed assets, billion rubles | 39.6 | 163.9 | 196.6 |
| *Share in the fixed assets of the economy, %* | 6.9 | 13.2 | … |
| Depreciation of fixed assets, % | 37.5 | 57.0 | 53.5 |
| Fixed capital investments, billion rubles | 9.8 | 18.2 | 22.1 |
| *Share in total fixed capital investments, %* | 20.9 | 18.9 | 12.0 |
| Balanced financial result, times to 2005 | 1.0 | 3.0 | 5.7 |
| Rate of return from sold goods, % | 26.6 | 31.3 | 21.2 |
| Expenditures per 1 ruble of products, rubles | 0.79 | 0.76 | 0.73 |

Note. Compiled from [8, 9]; data on oil and gas sector was given in general throughout the Komi Republic, considering that no separate statistics by regions is available, and the share of SAR in extraction exceeds 84%.

implementation of advanced production technologies and better equipment allowed providing by 2010–2011 the financial result of 14.6 billion rubles that is unprecedented for the Pechora coal basin; profitability increase up to 59.1% and 2-fold decrease of costs per 1 ruble of marketable products in 2011, as compared to pre-crisis 2007.

***Oil and gas.*** 30% to 40% of the produced oil has been processed on the territory of the Republic in recent years. The rest is delivered to foreign markets and in small amounts to the refineries of other Russian regions. Considering the indicators of compensating products export in 2011 (61% of gasoline, 66% of diesel fuel, 89% of residual fuel oil), one can say that the region's self-sufficiency is at a very high level, although the requirements of the local subarctic mining regions are mainly covered by imported products (intraregional deliveries). Crude oil remains the region's basic foreign economic commodity – 78% of the export value.

The high development degree of the Timan-Pechora oil and gas province within the Komi Republic mainly manifests itself in oil wells artificial lift. While in 2005, the development of deposits through natural energy of the reservoir accounted for a third of total hydrocarbon production, the figure dropped to 12% in five years.

Limited opportunities of companies concerning start up operations of new fields require more careful attention to non-operating wells at the existing facilities. While in 2005, their share reached 37%, in 2010 it made up only 27%. The maintenance of deteriorating assets in operating condition, due to new technological solutions combined with high tax burden, affects the return on oil and gas business, which, according to official statistics, is less than the similar indicators of the coal industry.

The share of associated petroleum gas flaring is still high in its consumption struc-ture (as light hydrocarbons resource, predominant in the SAR) – 26% in 2005 and 31% in 2010.

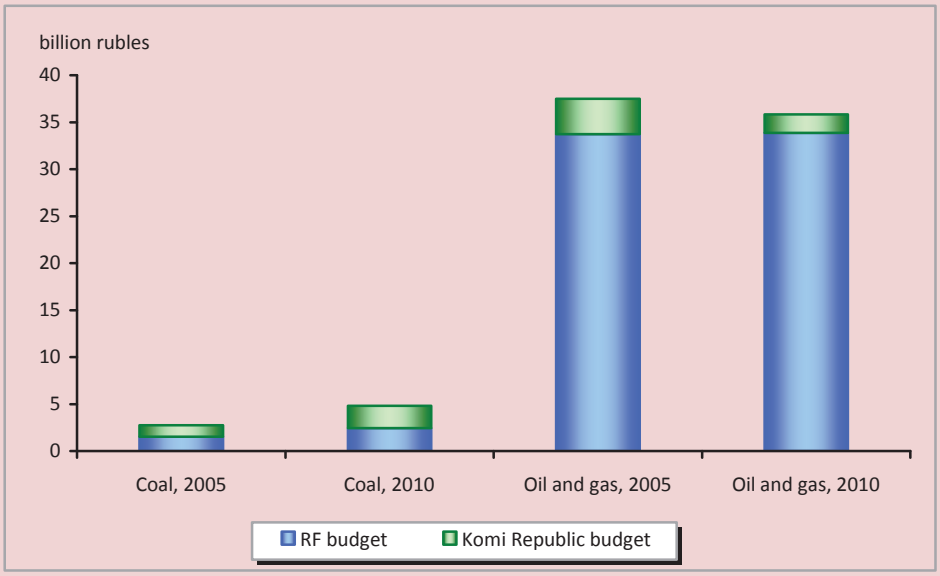
This fuel is used mainly to meet the needs of power industry (including municipal and regional), as well as to meet the companies' own technology needs (reservoir pressure maintenance, oil heating for transportation). The absence of commodity products (liquefied petroleum gas) does not currently allows considering such recycling as economically efficient and environmentally effective, particularly in subarctic regions of the Republic.

Improving condition of the coal industry and relatively stable position of oil production directly affect budget formation of all levels *(fig. 2)*. In accordance with this, socio-economic stability of mining and oil single-industry cities (Vorkuta, Inta, Usinsk) is maintained, i.e. three out of four major settlements on the territory of the Pechora- Ural Arctic.

The volume of tax payments to the budgetary system of the Russian Federation made by the coal industry enterprises of the Republic increased from 2.8 to 4.8 billion rubles for the 2005–2010 period, including the consolidated budget of the Komi Republic – almost twice, accounting for 6% of all tax revenues in the Republic. During this period the coal mining companies of the Komi Republic transferred more than 19 billion rubles to the budgetary system of the Russian Federation, more than 9 billion rubles of it into the consolidated budget of the region. The growth of coal production volume by 1.8 million tons in 2010, as compared to 2009, resulted in significant increase of tax revenues to the budgets of all levels.

Oil and gas extracting organizations remain the main taxpayers of the region, traditionally accounting for about 55–66% of tax revenues. The economic crisis led to a decrease of share up to 44% minimum in 2010. But already next year the sum of the above mentioned taxes increased again, reaching 48% of total fees. The change in world oil prices caused the increase in tax on mineral resources extraction, as the main budget source.

Figure 2. Dynamics of tax deductions made by energy sector enterprises of the Komi Republic to the budgetary system of the Russian Federation and the Komi Republic




According to Rosstat, in December 2011, Urals oil price was at the level of 107.6 US dollars per barrel, that is 20% higher than in the preceding year. In total, oil and gas sector of the Komi Republic accounted for almost 287 billion rubles of tax revenues for the 2005–2010 period. However, the consolidated budget of the region lost about 1.5 billion rubles since January 1, 2010, as the federal budget receives 100% of the income from oil mineral production tax (MPT).

**Institutional aspect of SAR functioning.** With regard to fuel sector regulation, the regions of the Pechora-Ural Arctic are strictly dependent on the level of corporate clustering. At present, the management of oil, gas, and coal territories is differentiated by two main groups. The first, "supra-regional" group comprises federal authorities, having complete power in the field of resource use, as well as vertically integrated companies directly involved in the exploitation of natural resources. The second, "subregional" group comprises public authorities of the subjects of the Russian Federation, local government and various institutions of public self-organization of the local population, according to national, cultural or territorial principle.

The weakness of the institutional forces of subregional level, facing external developed institutional forces, leads to the fact that all of the most notable organizational, economic and social changes occur only where it is profitable to extraterritorial corporations, and in the time frames, matching their strategies. Regional and local authorities have only to delegate part of their powers to these corporations (especially with regard to the realization of social initiatives, infrastructure development), as well as to respond to the situation post factum, relaying enterprise solutions for the local population and mitigating the consequences of the most sensitive ones.

The significant influence of such institution, as organized mission to local communities, indigenous peoples of the North is typical of the northern and, particularly, the arctic and subarctic regions not only in Russia but in the whole world. In the regions, characterized by headmost self-organization of citizens, corporations have to adjust its policy in order

to minimize the costs of possible resistance to the company's production activities in a specific territory and more globally to avoid reputational losses in the business community.

Public-private partnership, the notion of which is often replaced by the concept of state-private partnership in the context of Russian reality, is the mechanism of interaction beyond the scope of the applicable laws. Public-private partnership is regulated by the good will of the business and society seeking to improve the mutual benefits of good business reputation, while state-private partnership is regulated by the objective or subjective inertia of lawmaking, when less resources (time, financial, lobbying ones) are required for setting and following informal rules in order to change formal laws.

**Problems of SAR fuel and energy sectors.**

***Coal.*** Further increase in the production and enrichment efficiency of Pechora coal is connected with a set of technological measures, such as the unification of underground workings of Vorkuta and Zapolyarnaya opening onto Pechora concentrating mill, the increase in its capacity up to 9.5 million tons of ordinary coal, and the transition to a closed water-slurry circuit, providing the increase in the output of coking coal concentrate by 30–40%.

The development of a number of technologies on the waste coal processing in Russia determines the possibility and necessity of solving this problem for the Pechora coal basin. The processing of coal slimes, the volume of which amounts to 8 million tons, will improve the environmental situation of coal mining in the region, create additional resources of quality fuel energy, allow replacing such low-quality coal with compressed fuel for the consumers of the Komi Republic. In order to resolve this problem, the following measures should be implemented in full: the participation of the Republic in purchasing appropriate equipment, the introduction of taxation privileges up to break-even point of capital investments, the decrease of credit rates.

The issue concerning the wide use of mine metane as an independent resource, based on resource capacities, can not be solved yet due to the lack of a legislative base necessary for the decontamination and recycling of mine metane. The development of the programme on the expansion of mine metane extraction not only in operating but in closed mines will give the opportunity to solve the problem of Vorkuta gas supply.

The introduction of the technologies of deep processing of coal and waste coal is required to ensure the market competitiveness of coal products of promising deposits, massive environmental improvement and productivity enhancement. This will permit shifting from the simplified technological chain "coal mining – partial enrichment – energy use" to a more perfect "mining – enrichment – partial energy use, slimes and siftings pelletizing – partial use in the coal chemistry", thus changing raw development vector of the coal region to the processing one, with the production of high value products.

***Oil and gas.*** Effective, environmentally safe and socially oriented development of oil and gas sector (i.e. providing employment, income, access to services) on the territory of the Komi Republic directly depends on the ability of the executive authorities to position the region rightly in terms of its orientation: a) maintenance and development of the Arctic shelf resources, b) maintaining the sustainable rates of hydrocarbon extraction and processing on the continental part of the Timan-Pechora oil and gas province and the transit of the resources of the North and Western Siberia in the central regions of the country.

The expansionist policy has a number of serious limitations. Companies that are holders of licenses for the development of offshore fields (Rosneft and Gazprom) have minor production assets or other activity profile (pipeline transport) on the territory of the Komi Republic, while the owner of the well-

developed infrastructure (LUKOIL) faces serious political difficulties concerning access to marine deposits. In addition, the Komi Republic does not have a single pronounced competitive advantage over other oil and gas regions and Russia's arctic areas in order to become "a bridgehead for a dash to the North". In case such policy is successfully implemented, Usinsk will be the only subarctic district out of six, benefiting from the expansion.

On the other hand, the same reasons can reduce the risk of investment resources withdrawal from the territory. The absence of necessity to enter the "arms race" in the development of highly capital-intensive shelf will give regional companies the opportunity to deal with problems within the province. In this case, the development vector of oil and gas sector can be directed towards the Northeast (Inta and Vorkuta regions) and Northwest (Izhemsky, Ust-Tsilemsky regions). Regional government activities should be focused on resolving the issues concerning the development of geological exploration (including the funding by the resources owner), the protection of competition, assignment of significant tax incentives for the development of small, depleted and hard-to-recover reserves. It is also a rather difficult task, which is associated with large-scale financial injections and strong lobbying of the region's interests at the level of federal government and governing bodies of the vertically integrated oil companies.

The abandonment of arctic claims in favor of internal development will positively affect not only six subarctic, but also other regions of the Republic. Instead of unnecessary competition with the Murmansk and Arkhangelsk oblasts, Nenets and Yamalo-Nenets autonomous okrugs concerning resources development, the Komi Republic will be able to participate in the formation of the second echelon of support infrastructure. In this case, the latitudinal development of arctic regions – along the Northern sea route – is supplemented with meridional development of transport communications and processing capacities of subarctic regions, focused, primarily, on the local demand for fuel and energy resources, as well as creating the economic basis for further adaptation of the territory.

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# The role of conventional and alternative energy in the regions of the North

*The article considers the specifics of energy supply in the Northern regions of Russia, the advantages and disadvantages of conventional and alternative energy. It is shown that large power plants will focus on conventional sources of energy for a long time. Alternative energy can play an important role in supplying power to small decentralized consumers. The development of alternative energy is also necessary to test new power generation technologies.*

*Power generation, alternative energy, the North.*

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The territory of Russia's North is characterized by a heterogeneity of socio-economic development, economic conditions, unequal remoteness of different regions from transport and industrial centres located in temperate latitudes. The structure of the Northern regions' economy differs depending on the prevailing mineral, forest or other natural resources on their territories. But in any case, the provision of population's livelihood and normal functioning of the socio-economic system in harsh climatic conditions require reliable supplies of power to consumers. Organization of power supply in the regions of the North has its own specifics, conditioned by the presence of certain energy resources, history of economic development of different regions, their remoteness from existing oil and gas pipelines, concentration of large consumers in industrial hubs, population density, grid infrastructure development level and other factors.

The system of centralized power supply covers a significant part of consumers in the North. In some regions (Republic of Karelia, Murmansk Oblast) energy supply is carried out centrally by almost 100%. Thermal power stations (TPS), steam electric stations (SES), or state district power stations (SDPS) are major energy producers in most of the Northern regions with a predominantly centralized energy supply. Hydropower plays a significant role in the Republic of Karelia and Murmansk Oblast, hydroelectric power stations (HPS) operate in the Republic of Sakha (Yakutia), Magadan Oblast. Nuclear power stations operate in the Murmansk Oblast (Kola NPS) and in Chukotka Autonomous Okrug (Bilibino NPS). Centralized power supply covers areas with a relatively high population density, like industrial hubs with major producers and major consumers of energy (industrial enterprises, large settlements).

Transfer of power from producers to consumers in this case is carried out by transmission lines of different voltage.

At the same time, low population density and the presence of many small energy consumers are among the characteristic features of the vast Northern territories outside industrial development zones. These consumers are located mainly in remote areas inhabited by rural and indigenous population. Their centralized power supply is inexpedient, because it would require the construction of extensive and expensive infrastructure for energy transfer, and significant losses would occur in the process of transmission. Therefore, the energy supply of small remote consumers is decentralized. Such consumers are not connected to the regional energy system (let alone the Unified Power System of Russia), they are supplied with power from independent sources, represented mainly by small state or departmental power stations. Based on the volumes of produced and consumed energy, one cannot say that decentralized power supply plays a leading role in the Northern regions. Only a small percentage of power in the total amount is generated by decentralized plants. But it is necessary to support the decentralized energy generation on the vast Northern territories, otherwise the living conditions of the population will deteriorate, the development of existing natural resources will slow down, and strategically important territories will become depopulated. Decentralized power production is effected at small-scale power generation facilities, the majority of which are diesel-fired. There is no uniform interpretation of the term "small-scale power generation", its facilities have one common feature – low power. In [9] small-scale power generation is defined as "power suppliers with the units (boilers, turbines) that have a unit capacity of up to 25 MW, designed for supplying power to industrial and municipal consumers and operating along with the regional power system or autonomously".

Many small power stations should be provided with fuel. At that, a lot of Northern territories face the problem of limited transport accessibility, since fuel and energy resources, as well as foodstuffs and other necessary goods can be delivered only in short periods of marine and river navigation in the framework of "northern delivery". The high cost of generated electricity and heat is conditioned by the following factors: the necessity to deliver energy resources from afar and create their significant seasonal reserves; the long duration of the heating season.

An urgent issue concerns the supply of fuel to the regions, where the degree of development of local fuel and raw material reserves is low – the Murmansk, Magadan, Arkhangelsk oblasts, and Chukotka Autonomous Okrug [17]. But even the Northern regions with developed large-scale mining and production of energy resources need oil and coal deliveries in significant amounts. Even such regions as Khanty-Mansi and Yamalo-Nenets autonomous okrugs, Republics of Komi and Sakha (Yakutia), Kamchatka Krai and the Sakhalin Oblast are to a greater or lesser extent dependent on the deliveries of certain kinds of fuel and energy resources from other regions.

Thus, despite its substantial fuel and raw material base, the Sakhalin Oblast depends almost completely on the import of petroleum products from the continent: the oil produced in the Sakhalin Oblast is exported or it is directed for processing to Khabarovsk Krai; it is then re-imported to the oblast in the form of finished oil products [17, p. 93]. A similar situation is observed in other oil-and-gas-producing regions. Thus, the issue of fuel supply and, accordingly, the high cost of electric and thermal energy, produced on its basis, is relevant not only for decentralized energy supply of small remote consumers, but also for territorial power systems, having large thermal power stations in their composition.

It is necessary to solve the existing problems and obtain the following results: the reliability of power supply to consumers should be improved, the growth of energy prices curbed, the level of energy security in the Northern territories enhanced, and the deterioration of ecological situation prevented. A promising direction of power industry development in the Northern regions, reducing the acuteness of these problems, consists in the expansion of the implementation of non-conventional, renewable energy sources (RES). The involvement of local RES in the economy is often considered a way to solve the problem of supplying power to small decentralized consumers. At the same time, some authors propose the wide use of RES in the power system, so that in the future they could replace traditional energy sources; in particular a complete abandonment of nuclear energy is suggested. This article is devoted to the analysis of the role that different sources of energy play in the regions of the North.

Let us specify some concepts.

*Conventional energy* includes production of energy using traditional sources: heat of burnt fuel (heat power), waterpower of rivers (hydropower), and energy of controlled nuclear chain reaction (nuclear energy). In many cases, power plants working on traditional energy sources and included in the power systems have high capacity, i.e. the power generated by such plants is transferred to consumers through power transmission lines. On the other hand, in the areas of decentralized energy supply, many small-scale power generation facilities work on traditional fuel sources.

*Non-conventional energy* includes production of energy from non-conventional sources. Non-conventional energy sources are such sources the use of which for generation of power and thermal energy has not yet acquired large-scale character for a number of reasons. The main non-conventional sources of energy are wind energy, water power of small rivers, energy of the sun. Treating water power of small rivers as a non-conventional energy source is questionable, because a lot of small HPS were built in the 1960s, but later many of them were abandoned [10]. Non-conventional energy is also called *alternative*, because it represents an alternative to conventional energy.

In addition to conventional and non-conventional sources, one distinguishes between renewable and non-renewable energy sources. Non-renewable energy sources are fossil fuels (including coal, oil, gas), nuclear fuel. Renewable energy sources are almost always non-traditional, therefore, one commonly uses the term "non-conventional renewable energy sources" that are the "sources that are always present or recurring in the environment in the form of flows of energy from the sun, wind, geothermal energy, energy of seas, oceans, rivers, and biomass" [8]. The list of renewable energy sources, as defined by the Federal Law "On electric power industry" dated March 26, 2003 No. 35-FL, includes solar energy, wind energy, energy of water, tidal energy, wave energy of water objects, geothermal energy with the use of natural underground heat carriers, biomass, biogas, etc.

Conventional energy is based mostly on the use of non-renewable energy sources (except hydroenergetics). Alternative (non-conventional) energy is focused on the use of non-conventional energy sources. Alternative or renewable energy should not be identified with small-scale power generation.

Both conventional and alternative energy types have their advantages and disadvantages. Their overview, based on analysis of works [1, 2, 4, 5, 10, 13, 15] is given below.

**The main advantages of conventional energy are:**

- high density of energy flows (hundreds of kilowatts, and sometimes megawatts per square meter);
- high degree of technologies development and the developed structure of equipment

production at all stages: exploration of energy resources, their extraction, transportation, processing, usage, energy production and its transfer to consumers;

• developed infrastructure of research institutions, and scientific and operational personnel training structure.

**The main shortcomings of conventional energy are:**

• depletion of fuel and energy resources; easily accessible hydrocarbon reserves have been already exhausted, new fields have to be developed in remote areas (Polar regions, Eastern Siberia, shelf) that increases the cost of production;

• dependence on the amounts of supply, on fuel prices, on the situation in the market of fuel and energy resources;

• negative impact on the environment: pollution by wastes, thermal pollution, emission of carbon dioxide into the atmosphere by thermal power stations, which creates greenhouse effect; coal-fired power stations are especially harmful, because they produce large amounts of ash, soot, sulfur oxides and nitrogen oxides, which cause acid rains;

• great demand for water;

• potential threat of man-made disasters, including accidents at NPS with emissions of radioactive substances.

Alternative energy is focused mainly on the use of RES that are not only opposed to traditional energy resources, but that are also significantly different from each other by the nature of their generation and use. Accordingly, alternative energy has both the general advantages and disadvantages, and those inherent in a definite type of RES.

**The main advantages of alternative energy:**

• utilization of renewable and virtually inexhaustible sources of energy (wind, solar, geothermal, and tidal energy, etc.) allows using hydrocarbons in other sectors of the economy (in oil and gas chemistry);

• focus on the usage of local energy sources (sun, wind, geothermal energy, biomass) provides the approximation of generation facilities to the objects of consumption, allowing a 15–20% reduction in energy losses associated with its transmission and distribution;

• less negative impact on the environment compared to conventional power: the absence of emissions of pollutants when using RES, absence of heat pollution; the absence of environmental costs connected with mining, processing and transportation of fossil fuels;

• in most cases, power stations operating on the basis of RES, are easily automated and can operate without direct human participation;

• low probability of man-made disasters;

• opportunity to use the land on which non-conventional power plants (wind power plants, heat pumps, damless HPS), for economic purposes;

• insignificant water demand (for solar, wind power stations);

• development of alternative energy stimulates the development of science-intensive technologies;

• wind power requires only slight withdrawal of land: the area between wind turbines can be used in agriculture; if a wind turbine is installed in marine waters, there is no necessity of land withdrawal at all;

• tidal energy does not cause flooding of lands;

• solar panels can be mounted in almost any suitable place (for example, on the roofs of houses or on unused land). If necessary, solar power stations can be easily and quickly dismantled and the land used for other purposes.

**The main disadvantages of alternative energy:**

• in most cases, alternative energy is of a diffuse character and is characterized by low density of energy flows (solar radiation is less

than 1 kW per square meter, wind at the speed of 10 m/s and water stream at a speed of 1 m/s – about 500 W per square meter), which leads to the necessity of constructing large power installations;

• alternative power plants often lose out to conventional ones by economic indicators, consequently, they have significant payback period and low attractiveness for private investments;

• instability of power delivery and, consequently, the impossibility of forecasting the production of electricity and changes in the power of the station by the operator of the energy system;

• the necessity of backing up alternative energy with conventional energy facilities (for unstable sources of energy, such as solar and wind power); experience shows that when the share of capacity of power installations working on unstable sources of energy begins to exceed 20%, the power system may face serious problems, the prevention of which requires the introduction of additional regulatory capacities;

• construction of expensive complicated infrastructure to ensure the possibilities of obtaining electricity from other manufacturers (or other areas) in the case of decrease in the production of electricity from unstable sources, the necessity to create "smart grids";

• underdeveloped industry for the production of power installations, operating on alternative energy sources in Russia;

• placement of wind farms requires a lot of space (in some cases this drawback is compensated by the possibility of using the territory between the wind turbines for agricultural purposes);

• the work of large wind turbines (with a capacity of over 1 MW) may interfere with the transmission of television signals; large wind turbines placed in the coastal zone can create difficulties for military radar stations, which makes it necessary to carefully choose the location for such facilities on the strategic coastal areas of the North;

• tidal power plant (TPP) provide energy into the grid in four peaks a day; when constructing large TPP this may require construction of additional regulatory capacities;

• strong dependence of electricity generation by small HPS on river behaviour;

• high cost and, respectively, low economic efficiency of solar energy.

It is obvious that when searching for an answer to the question what energy is better, one can not focus on the number of positions in the above lists of advantages and disadvantages. For making decisions on the development of certain type of energy it is necessary to consider many factors including not only the availability of resources, but also the demand for energy, existing technologies, electricity generation costs, the range of its transmission to consumers, etc.

The alternative energy has both supporters and opponents. According to Konstantin Simonov, Director General of the National Energy Security Fund, "one of the main arguments of supporters of renewable energy is that... the whole Europe, the whole world is engaged in renewable energy, and we lag behind substantially, so we need to compensate for this lag urgently, urgently" [18]. Simonov indicates that "in Europe the situation is very different from the point of view of power generation. Europe has scarce hydrocarbon reserves. Europe buys oil, gas, coal abroad, i.e. in general, it faces the necessity of importing primary energy resources and it tries to find ways to produce electricity on its territory. The experience of the Europeans is quite poor at that. In terms of pricing, by the way, as well ... we have a completely different situation in the energy sector. Our country is the world's largest producer of oil and gas" [18]. In light of this, the desire to develop alternative energy is nothing more than a popular tendency.

Table 1. Capital investments in power stations of different types

| Type of power station | Capital investments, US dollars/kW | |
|---|---|---|
| | 2005 | 2030 (forecast) |
| Conventional hydroenergy | 1550–5500 | 1550–5500 |
| Nuclear power stations | 1500–1800 | 1500–2300* |
| Coal-fired TPS | 1000–1200 | 1000–1250 |
| Gas-fired TPS | 450–600 | 400–500 |
| Ground-based WPS | 900–1100 | 800–900 |
| Offshore WPS | 1500–2500 | 1500–1900 |

*Authors' estimation [1].
Source: [1] with reference to the International Energy Agency.

As already noted, the power stations working on non-conventional energy sources often lag behind traditional power plants in terms of economic indicators. *Table 1* shows the evaluation of the specific capital investments in power plants of various types. Currently, gas-fueled generation is the cheapest. From the types of power plants presented in the table, in the foreseeable future the reduction in the unit value is forecasted only for wind power stations (WPS) and TPS working on gas. But it concerns not only the unit cost of 1 kW of installed capacity. The capacity factor (CF) of solar and wind generation is several times lower than that of conventional energy [14]. Over the past decade, indeed, there has been a significant improvement in economic indicators of power plants working on the basis of non-conventional energy sources, and in some cases they can compete with conventional power plants. But often lower values of CF, combined with the dispersed nature of most non-conventional energy sources increase the cost of energy production and reduce the attractiveness of alternative energy for investors.

Opponents of alternative energy indicate the instability of alternative sources and, as a consequence, the necessity to back up non-conventional power plants with traditional energy facilities. However, as the practice of some countries shows, if non-conventional power plants account for no more than 20% of the installed capacity and there is an advanced network infrastructure connecting consumers with power plants of different types, there is no need in complete duplication of capacities. At the same time, if we speak about small remote consumers, whose energy supply comes from non-conventional power plants, isolated from the energy system, it is necessary to back up a greater part of the capacity (or the whole capacity). In other words, if the remote isolated consumer uses, for example, wind energy installation, it should have a diesel generator and a reserve of fuel for its operation in case of no wind.

*Table 2* provides data on energy supply of Russia's regions that are completely attributed to the territory of the North. The table was compiled using the materials [3, 6, 7, 11, 12, 16, 19, 20].

Despite significant technological potential of some non-conventional energy sources, the plans to build large power plants on their basis, as a rule, remain on paper. On the contrary, the projects of constructing small energy objects on the basis of non-conventional energy sources are more frequently implemented practically. At that one can notice a pattern: if the region has more decentralized energy consumers, if it is less covered by the networks of power lines and transport networks, if it is more remote from the suppliers of fuel and energy resources (oil refineries, coal mining enterprises, systems of transportation and distribution natural gas), then such region pays more attention to the practical implementation of the projects for the development of alternative energy sources.

Table 2. Specifics of power supply of the Northern regions

| Region | Power supply on the territory | Large conventional capacities | Potential and significant projects of alternative energy |
|---|---|---|---|
| Murmansk Oblast | Centralized, decentralized | NPS, HPS | Kislaya Guba tidal power station is operating, installed capacity is 400 kW.<br>High wind potential. Experimental wind turbine with a capacity of 200 kW. There are unrealized projects for constructing wind farms. A project of construction of wind turbines with the capacity of 150–400 kW for a collateral operation with diesel engines for power supply of small consumers has been developed. |
| Republic of Karelia | Centralized, decentralized | HPS, SES | Six small hydropower stations are in operation.<br>Peat reserves are available. In some localities it is intended to build five wind farms with a total capacity of 15.1 MW.<br>Possibility of using wood waste and animal waste is considered. |
| Arkhangelsk Oblast | Mainly* decentralized | TPS | There are two wind-diesel units with the capacity of 450 KW and 100 KW.<br>The feasibility study for constructing mini-TPS working on biofuel with the capacity of 5 MW was approved. There is a project of the Mezenskaya tidal power station, which capacity in 2020 could reach 700 MW, and in the future – 4000 MW. |
| Nenets Autonomous Okrug | Decentralized | Absent | Long-term target programme for the development of energy complex of the okrug provides for the creation of wind-diesel power plants in remote settlements. |
| Komi Republic | Centralized, decentralized | TPS | In 2006 a plant for production of biofuel (fuel granules) with a design capacity of 1.200 tons of biofuel per month was put into operation; markets: Western Europe, and consumers in the region.<br>The wind power park Zapolyarny (2.5 MW) is operating. |
| Yamalo-Nenets Autonomous Okrug | Mainly decentralized | TPS | Data not available. |
| Khanty–Mansi Autonomous Okrug–Yugra | Mainly decentralized | TPS | Available RES: timber industry waste, bioenergy potential of agricultural waste; energy of small rivers.<br>It is possible to build wind turbines in remote villages. |
| Tyva Republic | Decentralized | Absent | Compact solar power stations with the capacity of 140 W were developed in the framework of the programme “400 solar yurts”.<br>The Concept for the development and the scheme for placing the small hydro power facilities on the territory of the Republic of Tyva” was elaborated, according to which a small HPS has been already commissioned. |
| Republic of Sakha (Yakutia) | Mainly decentralized | TPS, HPS | Since 2007, a wind power station with a capacity of 250 kW has been operating in the settlement of Tiksi.<br>In 2011 a solar power station was launched, with the capacity of 10 kW in collaboration with a diesel power station; in 2012 its capacity was increased to 30 kW. In 2012 another solar power station with the capacity of 20 kW was commissioned.<br>It is planned to construct a low power SES in areas with woodworking industry waste.<br>Plans are being considered for the construction of HPS of small capacity. |
| Magadan Oblast | Mainly decentralized | TPS, HPS | Data not available. |
| Chukotka Autonomous Okrug | Decentralized | TPS, NPS | A wind-diesel power plant with the capacity of 3.0 MW was built in 2003. The construction of wind plants is planned along the entire Eastern coast.<br>In 2001 a project for the development of Kukunsky hot springs and construction of a system for supplying hot water to the settlement of Lorino was developed, and the feasibility study of the utilization of geothermal resources for constructing the central heating system in the settlement of Novoye Chaplino was carried out. |
| Kamchatka Krai | Decentralized | TPS | There are two 250 KW wind turbines on Bering Island and a small HPS with the capacity of 1.7 MW.<br>There are three geothermal power stations with a total capacity of over 70 MW. Geothermal resources are estimated at 5000 MW. |
| Sakhalin Oblast | Centralized, decentralized | TPS | There are geothermal sources there. The first unit of Mendeleev geothermal power plant with a capacity of 1.8 MW and a geothermal heating station GTS-700 capacity of 17 Gcal/h have been put into operation on Kunashir Island. |

* Mainly by the area of the territory covered.

The Murmansk Oblast is a region abundant in energy, and here the projects in the sphere of alternative energy are of experimental character. On the Barents Sea coast, 90 km from Murmansk there is the Kislaya Guba tidal power station, which was provided for studies to the Research Institute of Energy Structures (NIIES), and the Research Institute "Hydroproject". The Oblast had the experience of constructing an individual wind turbine (wind power installation JSC "Vetroenergo" with the capacity of 200 kW [1]).

Republic of Karelia, unlike the Murmansk Oblast, has scarce electric power, and pays more attention to alternative energy sources. Despite the fact that Karelia can receive (and receives) an excessive capacity of the Kola energy system via power lines, the republic is interested in enhancing its own energy independence and energy security of its consumers, including small consumers. Six small hydropower plants are already in operation there (technically, they are part of the Sunsky HPS cascade). The possibility of using wind resources of the Ladoga and Onega areas, peat reserves, the use of wood waste and animal waste to produce electricity and thermal energy.

A long-term target programme on the development of power complex of the Nenets Autonomous Okrug provides for the creation of innovation wind-diesel power plants in the region's remote settlements, which will significantly reduce public expenditures on "northern delivery". The Arkhangelsk Oblast has a wind-diesel complex in the settlements of Kamenka (450 KW) and Dolgoshchelye (100 KW), the feasibility study of the construction of a 5 MW mini-TPS working on biofuel in the settlement of Leshukonskoye has been approved. A major project is the construction of the Mezenskaya tidal power station, but it is not clear whether this project is going to be implemented, because it is valid only for a maximum variant of the general scheme of placement of electric power industry objects till 2020.

The Republic of Tyva is different from other regions, referred to the North, by the fact that it is not located in the high latitudes. This leads to relatively greater prospects for solar power in the region; it was reflected in the adoption of the republican programme "400 solar yurts" in 2003, which implies the construction of compact solar power stations. The Republic also plans to create small hydro power facilities. This kind of small power sources are suitable for using in remote, mountainous and difficult-to-access areas of the region.

Yamalo-Nenets and Khanty-Mansi autonomous okrugs, the republics of Komi and Sakha (Yakutia), Kamchatka Krai and the Sakhalin Oblast are in the better conditions according to the criterion of self-supply of energy in comparison with other regions of the North [17]. At that, Yamalo-Nenets and Khanty-Mansi autonomous okrugs, and the Republic of Komi are better equipped with the infrastructure for fuel deliveries (oil pipelines), and the power engineering in these regions focuses on conventional energy sources, although these regions possess alternative sources in significant amounts. Among the projects related to alternative energy sources it is necessary to point out a biofuel-producing plant constructed in the Komi Republic in 2006, however, it is oriented not only toward local consumers, but also toward export.

In 2007 the Republic of Sakha (Yakutia) launched a wind turbine that generates energy for the settlement of Tiksi. In 2011 for the first time in Yakutia a 10 kW solar power station running in parallel with a diesel electric power station was launched in the settlement of Batamay (Kobyaysky district). Solar panels have proved their efficiency; as a result, in 2012 the capacity of the plant was increased up to 30 kW, and another 20 kW solar power plant was built in the settlement of Yuchyugey (Oymyakonsky district) [11]. In the future it is planned to build small-capacity cogeneration plants running on local fuels or woodworking

industry waste, and low-power HPS.

The reserves of renewable energy in Chukotka Autonomous Okrug are significant, but they have not been used much so far. In 2003 the first wind-diesel power plant with the installed capacity of 3.0 MW was build there. In the future, it is planned to build wind plants along the entire Eastern coast of Chukotka. Geothermal resources available in the autonomous okrug can be used to provide the operation of systems for hot water supply and central heating in the nearby communities.

The Kamchatka Krai has several kinds of alternative power stations. It has a small hydropower plant on the Bystraya River, two wind turbines on Bering Island, and also three geothermal power plants. All geothermal stations are owned by JSC Geoterm, which is a subsidiary of JSC RusHydro. Such a variety of alternative power stations in Kamchatka can be explained not only by the availability of relevant energy sources and decentralized energy supplies to consumers in the most part of the krai's territory, but also by the isolated location of Kamchatka Krai on the peninsula; this fact contributes to the orientation of energy on local resources.

Non-conventional energy in the Sakhalin Oblast on the Kuril Islands is represented by geothermal springs. On the island of Iturup there are the explored reserves of steam-water mixture in a quantity sufficient for providing the town of Kurilsk with electricity. The island of Kunashir has already put into operation the first unit of Mendeleev geothermal power plant and a geothermal heating station.

Thus, different regions of the North show successful examples of small energy facilities based on alternative energy sources. But large power plants are not constructed on their basis. This can be partly explained by the fact that the considerable part of the sparsely populated Northern territories in general has no need in large-scale power plants. However, the projects of large power plants based on alternative sources are not implemented in the regions with higher population density, with large industrial consumers, and in those regions, where non-conventional power stations could operate as a part of regional energy systems along with conventional facilities. So, the projects of wind farms on the coast of the Barents Sea in the Murmansk Oblast remained on paper. It is not clear whether the project of constructing the Mezenskaya tidal power station in the Arkhangelsk Oblast will be implemented.

The role of traditional and alternative energy in the energy supply of the Northern regions is determined by its advantages and disadvantages. A certain kind of energy is developing, where it is expedient. Conventional power industry will still play an important role in the areas with relatively high population density, in the regions with large industrial hubs, and in those regions, where the emphasis was made historically on the construction of large power plants (mainly heat and/or hydropower plants). Some non-conventional power-generating facilities in these regions can be created for small consumers, who are remote from industrial hubs and are not connected to the power transmission line. Some non-conventional power plants can also be used in the experimental order. But mass construction of large power plants on the basis of alternative energy sources that can replace conventional energy industry in the coming years, is not expected in these regions.

Alternative energy in the Northern regions plays its role, which is important, but different from that of conventional energy. Exploitation of alternative power facilities is suitable where there are a lot of decentralized consumers, where population density is low, i.e. in the areas that are in need of small power. In remote areas the operation of small scale alternative power installations focused on the use of local alternative energy will help reduce the acuteness of the issue concerning the "northern delivery" of fuel, it will also reduce the cost of electricity

production, improve security of supplies of energy to local small consumers. This does not mean that remote areas can completely abandon the traditional capacities, since the capacities of alternative energy should, to some extent, be backed up by conventional energy facilities, so that in case of the decline (termination) of energy production it would be possible to switch from a non-conventional energy source to the energy supply from a reserve source. However, the role of alternative energy in the Northern regions is higher than in most of other regions, due to the specifics of productive forces placement, low population density, etc.

It should be noted that the development of alternative power is important from another point of view. Currently Russia exports oil and gas and, in general, it has no shortage of fuel and energy resources (although some individual regions are facing the problem of fuel deficit very seriously). But the traditional fuel and energy resources are exhaustible, their easily accessible supplies have been depleting, and the cost of production will only increase. A significant part of the hydropower resources of large rivers has already been developed. All of this indicates that sooner or later our country will require diversification of primary energy sources by more extensive development of alternative energy resources. However, Russia essentially lags behind the leading countries in development and implementation of technologies for using alternative energy sources. State support to the development of alternative energy, as a matter of priority provided to the projects based on the technologies developed in Russia and with the use of Russian equipment, will contribute to the reduction of this lag.

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# Deep processing – the main direction in enhancing the efficiency of fish utilization

*The article proves that the modern level of processing of catches does not correspond to the objectives of marine fishing development contained in the Concept for the development of fishery in the Russian Federation for the period until 2020 and the Russian Federation State Programme "Development of fishery complex". The article proves that to achieve the targets set out in the documents, the following measures should be carried out: the development of coastal fishing, the introduction of innovation technologies and equipment at coastal enterprises, the creation of integrated enterprises for production and processing of aquatic organisms, the enhancement of export efficiency, the promotion of unloading fish products onto Russia's shores.*

*Marine fishing, Northern basin, the level of processing of catches, high-tech products.*

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The Concept for the development of fishery in the Russian Federation for the period untill 2020 (hereinafter – the Concept) [1] and the Russian Federation State Programme "Development of fishery complex" (hereinafter – the State Programme) [2], in particular, state the following: "The strategic goal is to achieve by 2020 the level of economic and social development of the fishing industry, corresponding to the status of Russia as the leading world power of the 21st century, occupying the leading positions in the global economic competition. The achievement of this goal requires the transition of the fishery complex from the development based on raw materials export to innovation development".

The essence of the problem lies in the fact that it is deeply processed fish products that should be exported and supplied to the domestic market; and it is also necessary to process fish wastes. However, at present, the situation is totally different. Ground fish species (cod, haddock, pollack, perch, halibut and other), which should be processed into a variety of products, are often subject only to minimal processing (heading and gutting). In this form they are delivered both to the domestic market and abroad for further processing and production of various kinds of fish products. Fillet is produced in limited amounts. Pelagic fish (herring, mackerel, capelin, etc.) is salted, smoked, and sold whole and frozen.

Due to a poor development of high-tech processing in Russia's fishery, including that in the Northern basin, the value added is low and the contribution of the fishing industry in gross regional product is insignificant.

In marine fishery, the catches of fish and other marine products can be processed at sea on board the fishing vessels and factory ships, or they can be delivered to ports for production of various products at coastal enterprises.

In the pre-reform period the catches of fish in the Northern fishery basin were processed at sea to the greatest possible extent. For these purpose the trawlers, which had no freezing units, produced semi-finished products (headed and gutted fish), part of which was salted on board the ship, and the other part was delivered by contactless method to factory ships. Besides, they produced klipfish (salted cod with bones removed), chilled fish, fish packed in ice, canned food and edible fat manufactured from cod liver, fish flour from substandard fish and wastes.

Trawlers-factories and fish processing vessels produced fillet, splitted fish, frozen headed and gutted fish, various canned fish and preserves, fish flour. These fish products went for sale, as well as for further processing at coastal enterprises. At that, it should be taken into account that the products manufactured at sea or at shore-based fish factories from chilled raw fish are considered to be of higher quality and, as a rule, they are in great demand and have higher prices.

Shore-based enterprises produced mostly the types of products impossible or difficult to produce at sea: smoked, dried, structured (high-tech) products, various culinary products, canned fish and preserves, edible, veterinary and technical fish oils, fish meal from wastes, etc.

With the implementation of the above scheme, quite a high and efficient level of fish processing was achieved. For example, in 1980 and 1981, when some of the highest production volumes were achieved, the coefficients of the "depth" of fish processing (the ratio of the objects of production to the volume of production) were 0.69 and 0.71, respectively.

This means that the caught raw fish, after being processed, reduced in volume by 31% and 29.4%. The population received ready-prepared fish production and semi-finished products in significant quantities. The coefficients of the output of finished food products from the raw materials, aimed for food purpose, were 0.796 and 0.814. The production of canned fish and preserves in 1980 amounted to 189787 standard cans, in 1981 – 174141 standard cans; the production of fish meal was, respectively, 96.7 and 86.6 thousand tons [3].

To date, the composition of the fishing fleet and the range of products have changed dramatically. First, the total number of trawlers, compared with the 1980 level, decreased from 403 to 275 units (by 68.2%). Second, the number of vessels not equipped with freezer units, that had previously worked in one technological chain with coast-based enterprises decreased from 99 to 42 units (by 57.6%), out of which 31 units (73.8%) are small vessels for coastal fishing; consequently, the supply of population and coastal plants with chilled fish reduced dramatically. Thirdly, the number of vessels, capable of processing wastes and substandard raw materials into fish meal and fat, decreased to 69 units (down to 25% of the total composition), the rest of the vessels thrown waste and fish unsuitable for food production overboard. Fourth, the number of trawlers equipped with filleting machines decreased from 186 units (46.2% of the total number) to 70 units (25% of the total number) [4].

Thus, the changes in the structure of the fishing fleet do not contribute to the achievement of the goals set out in the Concept and the State Programme. Besides, throwing overboard substandard and non-target fish, as well as the waste from cutting catches contradicts the objectives of responsible fishing and reduces economic efficiency. After all, what is being thrown overboard includes small fish, the bycatch of non-target valuable fish species

and up to 67% of the amount of target fish catch, which could be used for producing hundreds of tons of food products and fish flour necessary for agriculture, and which is the main component in the production of feed for cultivating predatory fishes in aquaculture.

Such a situation results from the fact that the Northern basin uses mainly the Western-made vessels that are not equipped with fish meal plants. The productive capacity of such trawlers with regard to catches is a lot higher than that of conventional ones, and they have smaller crews. However, countries with developed fishing limit their usage in the North Atlantic, due to the development of coastal fishery using small vessels and seiner-trawlers that deliver catches to coastal enterprises for processing. They become the predominant type of vessel only in Russia, due to the great remoteness of the main fishing grounds, poor development of coastal fishing and absence of restrictions on trawl fishing. Currently, such vessels harvest approximately 1/3 of the total catch, and more than half of the total amount of ground fish species. In the medium term the Western-made trawlers will harvest about 90% of the total quota of ground fish species, allotted to Russia's Northern basin.

Changes in the structure of the fishing fleet and fish-dressing equipment (on board ships and at coastal plants) became one of the main factors in changing the assortment of fish products produced on board ships and at coastal enterprises. For instance, in 2011, the coefficient of the "depth" of fish dressing amounted to 0.862, which is worse than the results of 1980 – 0.69 and 1981 – 0.7. Fish was dressed to a lesser extent, despite the fact that the volume of caught ground fish subject to dressing, was greater, respectively, by 25.3% and 26.1%. The main types of fish products in 2011 were: frozen fish – 87.9% of the total volume, and fillet – 6% (in 1980 these types of products amounted to 80.2% and 0.8%). There were more different types of fish products of high-tech (deep) processing in 1980 than in 2011: canned food and preserves – 16.7-fold, culinary products – 39.1-fold, smoked fish and balyk – 48.8-fold, dried fish – 7.6-fold, feed flour – 14.6-fold and fish fats – 24.4-fold. Similar situation is observed in comparison with 1981 [5].

Economic conditions also do not always contribute to the increase in the production of "deeply" processed fish, the main type of which in the Northern basin of Russia is currently fillet. *Table 1*, according to the Russian and Norwegian statements, using the example of exported cod fish products shows the revenues per 1 ton of raw fish when producing headed cod and fillet. Thus, in 2009 the economic entities of the Murmansk Oblast sold 68.250 thousand tons of cod products abroad, including 58.15 thousand tons of headed and gutted production (85.2% of the total cod exports) and 7.9 thousand tons of fillet (11.6%). Other types of products amounted to only 2.2 thousand tons (3.2%).

Approximately the same range of fish products export is observed in the other years of the decade under consideration.

The data in table 1 shows that in 2009, judging by the expenditure of raw fish, it was by 18% more profitable to export filleted cod than headed cod. In 2011, this argument was lost, and, given that the labour intensity of fillet production compared with headed cod production [4] is approximately 1.6–2 times higher, one can see the unprofitability of fillet production in some years. For this reason, some ship owners even removed the filleting units from their vessels, having decided to produce only headed cod.

Financial performance could be improved at the expense of producing fish meal and fat from the waste, which range from 33% to 67% of fish weight. However, as it was noted above, there are no fish meal plants on board the Western-made vessels, and they will be also absent in the future.

Table 1. Data on the export of cod products

| Type of product | Thousand tons | Cost, million US dollars | Price per 1 kg, US dollars | Amount of raw fish used, thousand tons | Cost of products from raw fish, US dollars |
|---|---|---|---|---|---|
| 2009 From Russia (Murmansk Oblast) | | | | | |
| Frozen headed and gutted cod | 68.25 | 120.2 | 2.07 | 90.0 | 1.335 |
| Frozen fillet | 7.9 | 30.3 | 3.8 | 24.1 | 1.576 |
| From Norway | | | | | |
| Frozen headed and gutted cod | 28.8 | 72.2 | 2.56 | 43.7 | 1.652 |
| Frozen fillet | 14.07 | 90.0 | 6.4 | 42.9 | 2.097 |
| 2011 From Russia (Murmansk Oblast) | | | | | |
| Frozen headed and gutted cod | 72.8 | 213.8 | 2.9 | 112.8 | 1.922 |
| Frozen fillet | 11.1 | 61.7 | 5.6 | 33.7 | 1.831 |
| From Norway | | | | | |
| Frozen headed and gutted cod | 42.7 | 149.5 | 3.5 | 66.2 | 2.258 |
| Frozen fillet | 19.2 | 132.7 | 6.91 | 58.6 | 2.264 |

Sources: export of fish products of the Murmansk Oblast according to the data of the Oblast Statistics Committee; export of fish products of Norway according to the data of Nofima The Norwegian Institute of Food, Fisheries and Aquaculture Research.

In Norway, a wider range of products is exported and supplied to the domestic market, due to a different scheme of fishing and catches processing. First, all the catches in Norway, in accordance with the existing legislation, should be unloaded on the domestic coast.

Second, coastal fishing is well-developed, and about 70% of cod and haddock catches is carried out by smaller vessels. Fresher trawlers account for about a half of the remaining part of the total catch and only about 15% of the Norwegian quota of cod and haddock is caught by factory vessels.

Third, about 140 enterprises are engaged in the coastal processing of fish. They are relatively well provided with cooled raw fish and manufacture a variety of products.

The described fishery scheme allows Norway to produce a wide range of fish products mainly for export *(tab. 2)*.

Comparing the range of Norwegian export of cod with the products exported by the Murmansk Oblast on the basis of the 2011 data, the following should be noted:

1. Products of "shallow" processing, into which we include frozen and salted fish (a generally accepted definition does not exist so far), in the total volume of Norwegian export amounts to 25.8%, in the total volume of Russian export (Murmansk Oblast) – 84.7%.

2. The structure of Russia's export lacks the most expensive type of products, klipfish, the share of which in the total Norwegian export is 27.3%, and its cost is 37.7%.

3. The cost of 1 kg of any kind of fish products exported by Norway, is higher than the unit cost of production of the Murmansk Oblast. Total (average) price of 1 kg of Norwegian export products almost twice exceeded that of Russia in 2011 (in 2010 – 2.1-fold and in 2009 – 2.58-fold).

4. The estimated losses that the Murmansk fishermen suffered due to the difference in selling prices for cod in the international market in 2011 were approximately 65 million US dollars (in 2010 – about 43 million US dollars, and in 2009 – about 50 million US dollars). The losses caused by a poorer range of export products are determined in approximately the same amounts.

The situation that will take shape in the coming years in the Northern basin, as shown above, will be characterized by the technologically and economically limited capacity for

Table 2. The assortment of exported cod fish products from Norway

| Type of product | 2009 | | | 2010 | | | 2011 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Volume, thousand tons | Cost, million US dollars | Price for 1 kg, US dollars | Volume, thousand tons | Cost, million US dollars | Price for 1 kg, US dollars | Volume, thousand tons | Cost, million US dollars | Price for 1 kg, US dollars |
| Cooled | 14.9 | 58.4 | 3.92 | 17.5 | 64.8 | 3.7 | 25.5 | 114.8 | 4.5 |
| Frozen | 28.2 | 72.2 | 2.56 | 34.9 | 102.6 | 2.94 | 42.7 | 149.5 | 3.5 |
| Cooled fillet | 5.9 | 63.6 | 10.78 | 5.95 | 66.4 | 11.16 | - | - | - |
| Frozen fillet | 17.1 | 90.0 | 6.4 | 18.8 | 112.0 | 5.96 | 19.2 | 132.7 | 6.91 |
| Salted fillet | 0.9 | 6.8 | 7.56 | 0.65 | 4.2 | 6.53 | - | - | - |
| Dried | 4.2 | 78.1 | 18.0 | 5.1 | 83.5 | 16.38 | 4.0 | 94.8 | 23.7 |
| Salted | 20.8 | 112.3 | 5.4 | 25.0 | 126.0 | 5.04 | 29.1 | 180.4 | 6.2 |
| Klipfish | 34.3 | 267.5 | 7.8 | 41.3 | 319.2 | 7.73 | 45.0 | 407.3 | 9.05 |
| Dried heads | 1.7 | 6.3 | 3.73 | 2.8 | 9.6 | 3.44 | - | - | - |
| Minced fish | 1.03 | 2.7 | 2.62 | 1.4 | 4.0 | 2.88 | - | - | - |
| Total | 126.0 | 757.9 | 6.01 | 153.0 | 892.3 | 5.81 | 165.5 | 1079.5 | 6.6 |

producing high-tech fish products on fishing vessels. The analysis of this situation indicates that the transition of the fishery complex from the export of raw materials to the innovation type of development, as stipulated by the Concept, is possible only by means of a large-scale involvement of coastal fish processing enterprises in the solution of this issue. We think that it can not be achieved through the implementation of market-based measures alone; the solution essentially requires governmental interference.

The main reasons for this situation lie in the above mentioned transformations that took place in the structure of the fishing fleet and in the reorientation of deliveries of benthic fish products in foreign markets. This led to the change in production ideology. Formerly, catching fleets depended on the coastal enterprises, and the latter could affect the prices of raw materials and semi-finished products; at present, however, coastal enterprises are faced with the necessity to purchase ready-made frozen products from the fleets for further processing, which is, clearly, more expensive, and the products of these enterprises become unprofitable.

Institutional measures of government authorities in the past years of reforms were focused on the development of fishing alone, and they did not contribute to an increase in the deep processing of biological resources. The leadership of the Federal Agency for Fishery still declare that, in accordance with the rights and responsibilities, coastal processing is not included in the scope of their interests. In the end, the Concept proposes to fix the existing situation, but it does not specify how exactly it should be done.

The research into the economic efficiency of the complex "fishing vessels – fish processing plants", conducted in Vladivostok by TURNIF (Pacific Department of Fish Survey and Research Fleet) shows that in the case of deep processing of primary commercial object – pollack– that is delivered to the external market mostly ungutted and salted in a special way, the overall profitability of products, compared with sales from vessels is somewhat reduced, but there is a significant increase in sales and in value added per 1 ton of harvested biological resources [6]. This is what the rational use of biological resources should be. Based on the research results, a conclusion has been made

that the development of the coastal deep fish processing in Russia brings the greatest profit to the country, while the fishing enterprises themselves may not have it.

Thus, the issue of increasing the production of products with high added value is connected with the fact that deep-sea fishing vessels belonging to the suppliers of raw fish to coastal plants suffer a reduction in the profitability of sales. It is possible to find a solution to this issue at the governmental level either by providing fishing organizations with more preferences, or by creating a stimulating mechanism. For example, it is proposed to subsidize raw materials supplies for coastal plants, which, in our opinion, is inexpedient, as it concerns mainly aquatic organisms, the harvesting of which is connected with gaining significant rental income. In order to reduce prices for raw materials and semi-finished products, they can be somewhat reduced [7].

There exist certain methodologies of providing the owners of fishing vessels with quotas that stimulate deep cutting on board the vessels. One of the options that takes into account raw materials supplies for coastal plants at effective prices, has been developed at G.P. Luzin Institute of Economic Problems of Kola Scientific Centre of RAS.

It should be noted that the receipt of quota shares for the long-term perspective is very much satisfactory for ship owners, and it is conceivable that, on the basis of certain calculations, they can reduce prices for the fish intended for onshore processing. The drafting and approval of contract prices should be done by the associations of fishermen and fish processing enterprises under the supervision of government authorities, like in Norway, where such practice has been implemented for many years.

It is necessary to upgrade the system of external trade in fish. The creation of unnecessary competition, which can be observed nowadays, leads to substantial financial losses.

For example, due to various reasons, in July 2011 the average actual price of Russian fish exports was only 53% of the level of import prices [8]. This article shows that the prices for export products from Norway are considerably higher than those from Russia. In addition, excessive export leads to a deficit of raw materials and fish products, and contributes to the maintenance of high prices in the domestic market.

The facts and observations above, as well as the research into the situation concerning the development of onshore processing in the Soviet Union and abroad, allow us to say that the development of coastal fishing with the use of refrigerated vessels (without freezing installations) is the most affordable and efficient method of supplying raw fish to coastal enterprises. For these purposes, the countries with developed fishery use mainly the vessels with the length up to 30 meters for catching benthic fish. Along with trawls, other fishing gear is widely used, such as long-lines, nets, Danish seines, which help to save fuel, reduce production costs, and carry out selective fishing. Large amounts of pelagic fish are harvested using mainly seiner-trawlers that are equipped with refrigerating tanks and use highly efficient purse seine nets. The vessels without freezing installations are, as a rule, tied to specific coastal plants; this enhances their performance on a contractual basis, improves the catches processing efficiency, and helps to redistribute the natural resource rent. All the countries engaged in fishing in the North Atlantic promote the development of coastal fishing. For these purposes, the government limits the construction of factory trawlers; vessels that supply factories with whole fish are given large quotas of bioresources; coastal communities are provided with quotas of valuable bioresources, "first-hand" prices are regulated with the participation of fish harvesting enterprises, fish-processing enterprises and the government.

The efficiency of using seiner-trawlers for catching pelagic fish is proved by an example of Norway, which has no difficulties with harvesting any aquatic organisms in an unlimited amount. A high performance of fishing allows the Norwegians to supply Murmansk enterprises with raw fish at mutually beneficial prices. For example, the amounts of supplied fresh capelin are limited by the handling capacity of receiving facilities in the Murmansk fishery port and processing capacities of its enterprises. Due to the fact that Murmansk ship owners have no such vessels, and also due to the backwardness of port infrastructure and coastal processing capacities, Russia has already lost one third of total allowable catch of capelin; shrimp and cod are not harvested to the necessary extent.

Coastal fishing, carried out in the Barents Sea, does not fully correspond to its purpose, because the regulations allow freezer vessels to develop quotas as well. Due to this fact and other reasons, more than half of the catches do not reach processing enterprises.

In our opinion, the creation of integrated harvesting and onshore processing enterprises is an efficient measure in the development of high-tech production [9]. It is done by most of the countries with developed fishing in the Northern Atlantic coast. Fishing companies in the Northern basin are not willing to carry out onshore processing, because it requires solving many problems, including those connected with investing in new technologies. It is possible to streamline this process by redistributing quotas in favor of innovation enterprises.

**Conclusions**

The implementation of the provision of the Concept and State Programme of the Russian Federation concerning "...the transition of development of the fishery complex to the innovation type of development..." can be facilitated by the following activities.

1. Creation of the Export Council, funded by harvesting enterprises. The Council should develop the export strategy, study the world market of fish products, develop recommendations to exporters. The activity of the Export Council should result in the increase of export revenues due to the growth in the prices for fish products.

2. The increase in the scale of coastal fishing and the improvement of its organization. By implementing the suggested measures with regard to coastal fishing, the provision of population and coastal plants with raw fish and semi-finished products will be improved, the assortment of output products will be expanded, and export revenues will increase.

3. Creation of integrated enterprises specializing in harvesting and processing aquatic resources. These enterprises should become crucial for expanding the range of products, including high-tech, innovation products, and also for establishing trade without intermediaries.

In conclusion, it can be noted that the Northern fishery basin has a significant backlog of innovation technologies that remain non-demanded by the industry. And one of the reasons lies in the absence of a stable system for providing raw materials to the coastal enterprises and their underdevelopment. Only the complex development of the fleet and the shore enterprises will facilitate the implementation of the Concept for the development of fishery in the Russian Federation for the period until 2020 and the Russian Federation State Programme "Development of fishery complex".

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# Comparative characteristic of labour potential dynamics in the regions of the Northwestern Federal District*

*The article considers the methodological approaches to the quantitative and qualitative assessment of the region's labour potential. The comparative analysis of labour potential dynamics of the regions of the Northwestern Federal District of Russia for 2002–2010, the Komi Republic by the level of labour potential development among the district's regions has been carried out. The main reasons for the favourable dynamics of labour potential development index are revealed.*

*Labour potential, labour potential development index, Northwestern Federal District.*

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Labour potential is the total social capacity for work, i.e. potential labour capacity of society, its labour recources. The progress of the country's economic modernization depends on the quantitative and qualitative characteristics of labour potential. At the moment Russia has approached the line beyond which the quantitative characteristics of labour resources will be steadily deteriorating. While the share of the working age population which consti-

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tutes the basis of labour resources, increased from 57% to 61.3% in the 1989–2002 period, it remained virtually unchanged (61.3% and 61.6%, respectively) in the 2002–2010 period, despite the continuing migration inflow of the working age population from the neighbouring countries. Besides, a large number of regions have been experiencing a steady migration outflow for decades. Under the conditions of increase in fertility and life expectancy of the population, characteristic of the 2000s, the last intercensal period in these regions has been marked by the decrease in share of the working age population. Therefore, the issues related to the assessment of the dynamics of the region's labour potential, the factors determining its level, and the improvement of its qualitative characteristics are of great interest.

Labour potential of the country and its regions is understood as the corresponding human resources considered in terms of the unity of their qualitative and quantitative aspects; it can be defined as labour resources in qualitative terms [1, p. 40–41]. The quantitative characteristics of resources for labour can be assessed on the basis of the population census data, current demographic statistics and sample surveys on the population employment, regularly conducted in the country since 1992. The qualitative characteristics of labour potential do not have single deductive expression. Despite numerous research, the unified methodology for evaluating quantitative and qualitative characteristics of labour potential is yet lacking. Thus, in the studies of the RAS Institute of Social and Economic Studies of Population [2, 3] the system components of labour potential are represented in the form of the "tree" of properties, the top of which is social capacity that is the most general property. Such structure is based on the concept of qualitative characteristics of the population. The given methodology is applied in research carried out by the staff of Vologda Institute of Socio-Economic Development of Territories of RAS [4, 5], who has been annually analyzing the state of the Vologda Oblast labour potential and development prospects since 1996. The writing team highlights such components of labour potential as health, ethics, team spirit, creativity, activity, self-discipline, education, professionalism, working time resources.

In more recent research of the RAS Institute of Social and Economic Studies of Population [6] the focus is made on the qualitative aspect of labour potential with regard to the demographic resource, within which, in fact, human and labour potential is formed. The authors define the quality of labour potential by the set of indicators reflecting its quantitative and qualitative characteristics: size and structure of the economically active population, health, education and skills, labour productivity.

The scientists of Saint Petersburg sociology school [7] developed the concept of the three-tier structure of labour potential, including psychophysiological potential (health status, type of the nervous system, working capacity and stamina, production and qualification potential (the volume of general and special knowledge, skills and abilities, development degree of the ability to work systematically, ability to work productively) and personal potential (level of social maturity, value system, interests, needs and demands at work, desire and willingness to work in good faith and with full dedication).

The Ivanovo State University offers the methodology [8], which also considers three components of labour potential: psychophysical components (life expectancy at birth, mortality rates among working-age population, rate of mortality from suicides and murders, population morbidity rate, crime rate), a social component (poverty rate, coefficient of living standards, share of meal expenses, availability of durables, savings rate) and educational and intellectual component (share of economically active population with high level of professional

education, level of employment in science, share of specialists and directors, number of postgraduates and doctoral candidates, the share of researchers and technicians in the total number of the employed in science).

In order to assess labour potential, the Samara State Economic Academy [9] applies the methodology based on the use of expert assessments of the potential opportunities for labour activity of the population of different age groups (separately by gender), taking into account their number and the level of labour activity.

The Bashkir State University has developed the methodology of system analysis of the composition and structure of labour potential of the country and region [10, 11], that allows expanding the modern structure of labour potential, to reveal quantitative parameters (demographic structure) and qualitative parameters (vocational and qualification structure of the population) of labour potential, employment potential, the conformity of the working-age population to the needs of the market economy, to determine the nature and the degree of labour-employment activity.

This methodology considers the following aspects as basic indicators of labour potential development: 1) the share of the working-age population in the total number of population; 2) the level of education, professional training and retraining, qualification and work experience, contributing to the the increase of the employee's capacity; 3) wages; 4) equipment of the worker with the means and instruments necessary for labour; 5) the level of employment, labour activity. Sub-indices are calculated by single formula for all five basic indicators:

$$I_n = (C_{fact.(n)} - C_{min(n)}) / (C_{max(n)} - C_{min(n)}),$$

where $C_{fact.(n)}$, $C_{min(n)}$, $C_{max(n)}$ are correspondively factual, minimum and maximum values of the component n in labour potential.

General index of labour potential development is the synthesis of partial indices, which is calculated as their average arithmetic average. The values of all the components of labour potential development index, as well as the value of the integral index, change from "0" to "1". This range allows evaluating the results of the region in achieving the highest possible level of the index under consideration. This approach seems to be the most accurate, as the index method allows different characteristics to be reduced to a comparable form.

The authors used the basic principles of this methodology for estimating labour potential dynamics of the regions of the Northwestern Federal District, having made some changes in the composition of its basic indicators, by which special indices have been calculated and the choice principle of the indices of maximum and minimum comparison bases has been slightly modified.

*1. Work life expectancy.*

Work life expectancy index is calculated simirlarly with the index of the population life expectancy. In compliance with the ILO methodology, adopted for the Russian sample surveys on employment, age boundaries of the population economic activity make up 15–72 years. Accordingly, the minimal value of the work life expectancy is 10 years: 25 years of minimum life expectancy applied when calculating the index of population life expectancy, excluding 15 years till the lower bound of economic activity, i.e. is the time period during which an individual, living in the conditions of mortality regime, corresponding to the minimum population life expectancy, can work. The maximum value of the work life expectancy makes up 57 years (72 year excluding 15 years prior to the economic activity). The real value will equal the actual life expectancy of the region's population minus 15 years, in the case when the life expectancy of the region's population is less than 72 years (as at present in Russia).

For example, if the population life expectancy is 65 years, the actual work life expectancy will make up 50 years. If the actual life expectancy of the region's population exceeds 72 years, the real value of the work life expectancy will be equal to its maximum value of 57 years (72 minus 15 years) – in this case, the value of index duration of the working life will reach 1.

*2. Index of the level of professional education of the employed population.*

The quantitative data on the share of the employed population with higher, incomplete higher and secondary professional education in the structure of the employed population, derived from 2002 and 2010 censuses, and the results of sample surveys on employment surve as the basis for calculating the given index. The value exceeding the largest share of the population with higher, incomplete higher and secondary professional education in the total employed population among all the regions of the country, registered in 2000s, is taken as the maximum value of the level of professional education. Accordingly, the value not exceeding the lowest share of the employed population with the specified level of education by the countries' regions is taken as the maximum value. According to the 2002 census, the maximum share of the employed population with high level of professional education was observed in Moscow (60.3%), the mininmum share – in the Chechen Republic (21.7%). In compliance with the sample surveys of the population employment, in the intercensal period the maximum percentage was also observed in Moscow (79.1% in 2008), and the minimum – in Ust-Orda Buryat AO (29.2% in 2003). According to the census of 2010, the highest proportion of the employed population with higher, incomplete higher and secondary professional education was registered in Saint Petersburg (85.7%), the lowest – in the Chechen Republic (56.5%). Based on these figures, the maximum value was adopted for 90%, the minimum value – for 20%.

*3. Population employment index.*

The level of population employment (the share of the employed out of the number of population aged 15–72 years) is the most important indicator characterizing the conditions and level of labour potential development. The indicators, persisting in the country's most developed regions in the conditions of nearly crisis-free development with the unemployment not exceeding the natural rate (4–5% of the economically active population), can be adopted for the maximum value of employment. it would be logical to take the value not exceeding 80% as the maximum level of employment, taking into account the best levels of employment, registered in 2010 in Saint Petersburg (71.6% of the population aged 15–72 years) and in 2012 in Moscow (72.2%), at which the levels of total unemployment made up 2.6% and 1.4% of the region's economically active population respectively. However, the absolute maximum level of the population employment registered in 2006 in Chukotka AO (79.9% of the Okrug population aged 15–72 years were occupied in the economy at the overall unemployment rate of 3.7% of the economically active population), almost reaches this value. A similar situation may occur in the future and in other Northern regions of the country; that will limit the possibility of extending index time series. Therefore, the maximum level of employment in our calculations was adopted for 85%; the minimum – for the level below the worst value of the employment indicator observed in the 2000s in the most crisis regions, recorded in the Republic of Ingushetia, where in 2006 only 16.8% of the population aged 15–72 were occupied in the economy. In the authors' calculations the minimum employment makes up 15%.

*4. Index of gross regional product (GRP) per capita.*

This index characterizes the conditions and living standards of the population, the material basis for the reproduction of labour, the region's total employment potential. The methodology of system analysis of quantitative and qualitative characteristics of labour potential, applied by the authors of the article, was developed by G.V.Yakshibaeva, who suggests to take the fixed maximum value of the gross domestic product, equal to 40 000 US dollars (by purchasing power parity), and the minimum value of 100 US dollars, used for calculating the human development index, as the maximum and minimum values of GRP per capita [10, 11]. As the authors faced the challenge of inter-regional comparison of labour potential of Russian regions, the value, exceeding the highest rate of GRP per capita by the country's regions, fixed in the 2000s was adopted for the maximum value; the value less than the worst rate of GRP for 1990s–2000s – for the maximum value. The highest value of GRP per capita was registered in Nenets AO in 2010 (3,461,997.6 rubles), the lowest – in the Republic of Ingushetia in 1998 (3,428.9 rubles). In the authors' calculations 3 500 000 rubles was adopted for the maximum value of GRP per capita, 3000 rubles – for the minimum value.

*5. Index of capital-labour ratio.*

In statistics capital-labour ratio is determined by the ratio of the cost of operating funds to the number of the working population. There are a lot of problems of methodological character related to the determination of the numerator and denominator. The author of the applied methodology uses cross-country indicators as the maximum and minimum values of capital-labour ratio. The maximum value is the highest indicator of the most developed country, the minimum value is zero level corresponding to the conditions of manual labour [10, 11]. The authors also adopted zero level for the minimum value and the value, exceeding the best value of capital-labour ratio by Russian regions, registered in the 2000s – for the maximum value. In general, for the entire period under review the Yamalo-Nenets AO maintains the leading position on capital-labour ratio, with the maximum value of 15,350.0 million rubles/thousand people registered in 2010. Therefore, the authors adopted 20,000 million rubles/thousand people for the maximum capital-labour ratio.

The suggested method for calculating the index of labour potential development is universal. It can be used for analyzing the dynamics of the regions' labour potential, for the comparative analysis of labour potential between regions, between urban and rural areas. However, its wide application is limited by lack of relevant information. Special information difficulties in calculating and applicating this indicator can be found at the grassroots administration: when making inter-territorial comparisons within the country's regions.

In the study the authors attempt to determine the position of the Komi Republic by the level of labour potential development among the regions of the Northwestern Federal District (NWFD), in which it is included. *Table 1* presents the dynamics of the integral index of labour potential development (ILPD) in the NWFD regions in the intercensal 2002–2010 period, the population census is one of the most important information sources about the population. It allows obtaining information not only about the population and its demographic characteristics (sex and age structure, the number and structure of families, population distribution throughout the country, etc.), but also about social and economic characteristics (population structure by education, employment, sources of subsistence). Only the census provides the maximum reliability of the information about the population and, in particular, can most accurately assess the employment rate and the level of professional training of the employed population.

Table 1. Dynamics of labour potential development index in the subjects of the Russian Federation, constituting NWFD, in 2002–2010*

| Regions | Index value |
|---|---|
| 2002 | |
| *Northwestern Federal District* | *0.439* |
| Saint Petersburg | 0.486 |
| Vologda Oblast | 0.455 |
| Nenets Autonomous Okrug | 0.444 |
| Murmansk Oblast | 0.436 |
| Kaliningrad Oblast | 0.424 |
| **Komi Republic** | **0.419** |
| Arkhangelsk Oblast | 0.414 |
| Leningrad Oblast | 0.407 |
| Republic of Karelia | 0.406 |
| Novgorod Oblast | 0.405 |
| Pskov Oblast | 0.380 |
| 2006 | |
| *Northwestern Federal District* | *0.428* |
| Nenets Autonomous Okrug | 0.490 |
| Saint Petersburg | 0.473 |
| Murmansk Oblast | 0.427 |
| Republic of Karelia | 0.421 |
| **Komi Republic** | **0.410** |
| Leningrad Oblast | 0.404 |
| Kaliningrad Oblast | 0.403 |
| Vologda Oblast | 0.401 |
| Novgorod Oblast | 0.399 |
| Arkhangelsk Oblast | 0.396 |
| Pskov Oblast | 0.379 |
| 2010 | |
| *Northwestern Federal District* | *0.525* |
| Nenets Autonomous Okrug | 0.757 |
| Saint Petersburg | 0.579 |
| Murmansk Oblast | 0.520 |
| Leningrad Oblast | 0.513 |
| **Komi Republic** | **0.510** |
| Kaliningrad Oblast | 0.497 |
| Arkhangelsk Oblast | 0.490 |
| Vologda Oblast | 0.488 |
| Republic of Karelia | 0.476 |
| Novgorod Oblast | 0.475 |
| Pskov Oblast | 0.450 |

* Ranked in descending order by ILPD value.
Calculated on the basis of Rosstat data: [12, 13, 14, 15].

Therefore, the corresponding partial indices of ILPD are calculated in the paper according to 2002 and 2010 censuses data. At the same time, intermediate 2006 year, in which the index of the level of professional education of the employed population had been calculated on the basis of the results of sample surveys on the population employment, was also included in the analysis, due to the considerable duration of the intercensal period.

In general, for the 2002–2010 period the integral index of labour potential development increased in the Northwestern Federal District by 19.9% (with 0.439 to 0.525). Thus, in the first decade of the 21st century in the context of economic growth, the labour potential of NWFD is characterized by positive dynamics. However, it should be noted that the negative ILPD dynamics was registered in the first half of the period under review – both in the district and in most regions as a whole (except for Nenets AO and the Republic of Karelia). But the decrease in ILPD value was insignificant in 2002–2006, based primarily on the decrease in the index of professional education of the employed population, which may be only a consequence of the specifics of sample surveys on the population employment, and the subsequent growth is more significant. As a result the growth f the integral index of labour potential development was registered in all regions of the Okrug for the 2002–2010 period.

In the Komi Republic the index of labour potential development increased somewhat more significantly than in the district as a whole: 21.7% (with 0.419 to 0.510). Nevertheless, its level in the Komi Republic is still lower than in the Northwestern Federal District on average. In 2002, the Komi Republic ranked 6th in the array of the NWFD regions by the ILPD level. In Saint Petersburg, the Vologda Oblast, Nenets AO, the Murmansk and Kaliningrad oblasts the situation was better than in the Komi Republic. At that, in 2002 above average rate of the integral index of labour potential development by the Federal District was typical of Saint Petersburg, the Vologda Oblast and Nenets AO. In all other Northwestern regions ILPD was below average in 2002.

For 2002–2010, the position of the Komi Republic in the array of the regions of the Northwestern Federal District somewhat improved, moving from the 6th place to the 5th place, surpassing the Vologda and Kaliningrad oblasts, but giving way to the Leningrad Oblast, where the index of labour potential development increased by 26.0% for the 2002–2010 period. Apart from the Leningrad Oblast, as in 2002, the Komi Republic is outstripped by Nenets AO, that moved from the 3rd to the 1st position and was characterized by considerable ILPD growth (70.5%), Saint Petersburg and Murmansk oblasts, where the growth of the integral index in the 2002–2010 period was less significant than in the Komi Republic. Conspicuous is also the fact that for the 2002–2010 period the Vologda Oblast fell from the second to the 8th place among the regions of the Federal District, with the lowest registered ILPD growth of 7.3% in the North-West.

Let us consider to what degree a certain subscript ensured the positive dynamics of the integral index of labour potential development.

The index of the work life expectancy increased in NWFD by 13.8% (from 0.832 to 0.947) in the 2002–2010 period *(tab. 2)*, which is logical under the conditions of the rise in population life expectancy. In general, for the 2002–2010 period, the life expectancy of the population of the Federal District has grown from 63.84 to 70.07 years.

The index of the population work life expectancy increased to the maximum extent for the 2002–2010 period in the Leningrad and Kaliningrad oblasts (by almost 20%). In Saint Petersburg, the Republic of Karelia and the Arkhangelsk Oblast the index growth is about average level across the district. At that, the index of the population life expectancy in Saint Petersburg that is traditionally the leader of the district by the index of the population work life expectancy just could not increase more considerably, as its value in the region by 2010 already reached the maximum value of unit since the life expectancy of Petersburgers exceeded the upper limit of the economic activity of 72 years. In the Pskov, Novgorod,

Table 2. Dynamics of the index of the population work life expectancy in the subjects of the Russian Federation, constituting NWFD, in 2002–2010*

| RF subjects | Index value | | | Growth rates, % | |
|---|---|---|---|---|---|
| | 2002 | 2006 | 2010 | for 2002–2006 | for 2002–2010 |
| *NWFD* | *0.832* | *0.864* | *0.947* | *3.8* | *13.8* |
| Saint Petersburg | 0.881 | 0.934 | 1.000 | 6.0 | 13.5 |
| Kaliningrad Oblast | 0.794 | 0.832 | 0.943 | 4.8 | 18.8 |
| Leningrad Oblast | 0.783 | 0.811 | 0.931 | 3.6 | 18.9 |
| Murmansk Oblast | 0.864 | 0.855 | 0.929 | -1.0 | 7.5 |
| Arkhangelsk Oblast | 0.815 | 0.847 | 0.922 | 3.9 | 13.1 |
| Vologda Oblast | 0.826 | 0.860 | 0.909 | 4.1 | 10.0 |
| **Komi Republic** | **0.817** | **0.834** | **0.902** | **2.1** | **10.4** |
| Republic of Karelia | 0.791 | 0.826 | 0.898 | 4.4 | 13.5 |
| Nenets AO | 0.838 | 0.791 | 0.869 | -5.6 | 3.7 |
| Novgorod Oblast | 0.785 | 0.802 | 0.867 | 2.2 | 10.4 |
| Pskov Oblast | 0.768 | 0.770 | 0.862 | 0.3 | 12.2 |

* Ranked in descending order by the index value in 2010.
Calculated on the basis of Rosstat data: [12, 13, 14, 15].

Vologda oblasts and the Komi Republic, the index of working life expectancy increased by 10–12%, in the Murmansk Oblast – by 7.5%. The most insignificant growth of the index was recorded in Nenets AO (3.7%), rating of which worsened for the 2002–2010 period, having fallen from the 3rd to the 9th place for the district. As a matter of fact, some decrease in the index of working life expectancy was observed in Nenets AO, as well as in the Murmansk Oblast in the 2002–2006 period. The Komi Republic's ranking also worsened, having fallen from the 5th to the 7th place. The deterioration of the index value is quite natural for resource regions with young age distribution, as the life expectancy of the population has been increasing in the recent years primarily due to the growth of investment in the healthcare modernization, while regions with a high share of mortality from external causes have benefited from it to a lesser extent. More or less stable ranking positions are characteristic of the majority of the NWFD regions. Only the Leningrad and Kaliningrad oblasts have significantly improved their positions by the index of working life expectancy. And Saint Petersburg, as has been already noted, reached the maximum.

The index of the level of professional education of the employed population increased for the 2002–2010 period in NWFD by 24.0%, i.e. even more considerably than the index of the working life expectancy *(tab. 3)*. According to the 2002 and 2010 censuses, the share of the employees with higher, incomplete higher and secondary professional education has grown significantly in the 2000: from 65% to 75.8% of the total number of the employed. As have been already mentioned, in compliance with the results of sample surveys on employment, the specified index and the corresponding index have decreased rather significantly in 2002–2006. However, the 2010 census has not confirmed the estimates based on sample surveys, having recorded a significant growth in the level of professional education of the employed population as a whole for the intercensal period.

To the greatest extent the growth of the index of the level of professional education of the employed population for the 2002–2010 period is characteristic of the Leningrad Oblast (34%), Nenets AO (33%), the Murmansk Oblast (31%) and the Republic of Karelia (30%). Despite this, Nenets AO remains at the end of the list of the NWFD regions,

Table 3. Dynamics of the index of professional education level of the employed population in the subjects of the Russian Federation, constituting NWFD, in 2002–2010.*

| RF subjects | Index value | | | Growth rates, % | |
|---|---|---|---|---|---|
| | 2002 | 2006 | 2010 | for 2002–2006 | for 2002–2010 |
| *NWFD* | *0.643* | *0.464* | *0.797* | *-27.8* | *24.0* |
| Saint Petersburg | 0.791 | 0.567 | 0.939 | -28.3 | 18.7 |
| Kaliningrad Oblast | 0.656 | 0.416 | 0.776 | -36.6 | 18.3 |
| Leningrad Oblast | 0.579 | 0.424 | 0.776 | -26.8 | 34.0 |
| Murmansk Oblast | 0.563 | 0.431 | 0.736 | -23.4 | 30.7 |
| Republic of Karelia | 0.541 | 0.479 | 0.703 | -11.5 | 29.9 |
| **Komi Republic** | **0.570** | **0.423** | **0.703** | **-25.8** | **23.3** |
| Vologda Oblast | 0.566 | 0.339 | 0.703 | -40.1 | 24.2 |
| Novgorod Oblast | 0.570 | 0.470 | 0.693 | -17.5 | 21.6 |
| Nenets AO | 0.511 | 0.276 | 0.681 | -46.0 | 33.3 |
| Arkhangelsk Oblast | 0.531 | 0.334 | 0.679 | -37.1 | 27.9 |
| Pskov Oblast | 0.557 | 0.426 | 0.671 | -23.5 | 20.5 |

* Ranked in descending order by the index value in 2010
Calculated on the basis of Rosstat data: [12, 13, 14, 15].

although having risen up from the last 11th to the 9th place for the district: the index of the education level in the autonomous okrug was initially very low. The Murmansk Oblast (having fallen from the 7th to the 4th place) and the Repubic of Karelia (having moved from the 9th to the 5th-6th-7th places) greatly improved their ratings. Some deterioration in the rating is characteristic of the Komi Republic, the index of which increased by 23.3% for 2002–2010: it dropped from the 4th place in 2002 to the 5th-6th-7th places in 2010. It is quite logical, considering that almost no professional staff comes to the Komi Republic from the outside for more than two decades already. The noticeable deterioration in rating is also typical for the Novgorod and Pskov oblasts, experiencing significant migration outflow of the educated youth, primarily in Saint Petersburg.

The index of the population employment in NWFD increased by 8% for 2002–2010 *(tab. 4)*, which is natural in the conditions of the employment growth. It grew from 62.5% to 66.3% of the employed out of the total number of population aged 15–72 years in the district for the 2002–2010 period. This index increased in the Pskov and Leningrad oblasts to the maximum extent – by 16–17%. However, the Pskov Oblast at that preserved its last ranking position, while the Leningrad Oblast moved from the last but one 10th place to the 4th place. The Novgorod Oblast (from the 9th to the 5th place) and the Murmansk Oblast (from the 3rd to the 2nd place) improved their ranking positions.

At the same time, zero (and even slightly negative) growth in the employment index was registered in the Arkhangelsk Oblast and the Republic of Karelia for 2002–2010. The positions of these regions have worsened significantly (by three points) for 2002–2010. Low values of the population employment index were observed in the Vologda and Kaliningrad oblasts and Nenets AO, the ratings of which also worsened. The Komi Republic maintained its 7th place, with the value of the employment index having increased somewhat more significantly than in the whole district, and mainly at the end of the period under review.

For the 2002–2010 period the index of gross regional product per capita increased in the Northwestern Federal District even more significantly, by several times, (from 0.017 to 0.081, i.e. 4.8 times) *(tab. 5)*.

Table 4. Dynamics of the employment index in the subjects of the Russian Federation, constituting NWFD, in 2002–2010*

| RF subjects | Index value | | | Growth rates, % | |
|---|---|---|---|---|---|
| | 2002 | 2006 | 2010 | for 2002–2006 | for 2002–2010 |
| *NWFD* | *0.679* | *0.730* | *0.733* | *7.5* | *8.0* |
| Saint Petersburg | 0.724 | 0.784 | 0.794 | 8.3 | 9.7 |
| Murmansk Oblast | 0.709 | 0.747 | 0.761 | 5.4 | 7.3 |
| Nenets AO | 0.710 | 0.794 | 0.739 | 11.8 | 4.1 |
| Leningrad Oblast | 0.634 | 0.701 | 0.733 | 10.6 | 15.6 |
| Novgorod Oblast | 0.639 | 0.664 | 0.713 | 3.9 | 11.6 |
| Vologda Oblast | 0.689 | 0.723 | 0.701 | 4.9 | 1.7 |
| **Komi Republic** | **0.647** | **0.650** | **0.700** | **0.5** | **8.2** |
| Arkhangelsk Oblast | 0.681 | 0.709 | 0.680 | 4.1 | -0.1 |
| Republic of Karelia | 0.670 | 0.730 | 0.670 | 9.0 | 0.0 |
| Kaliningrad Oblast | 0.646 | 0.716 | 0.664 | 10.8 | 2.8 |
| Pskov Oblast | 0.551 | 0.656 | 0.644 | 19.1 | 16.9 |

* Ranked in descending order by the index value in 2010.
Calculated on the basis of Rosstat data: [12, 13, 14, 15].

Table 5. Dynamics of the index of gross regional product per capita in the subjects of the Russian Federation, constituting NWFD, in 2002–2010*

| RF subjects | Index value | | | Growth rates, % | |
|---|---|---|---|---|---|
| | 2002 | 2006 | 2010 | for 2002–2006 | for 2002–2010 |
| *NWFD* | *0.017* | *0.045* | *0.081* | *164.7* | *376.5* |
| Nenets AO | 0.113 | 0.458 | 0.989 | 305.3 | 775.2 |
| **Komi Republic** | **0.023** | **0.065** | **0.110** | **182.6** | **378.3** |
| Saint Petersburg | 0.020 | 0.049 | 0.097 | 145.0 | 385.0 |
| Murmansk Oblast | 0.021 | 0.054 | 0.083 | 157.1 | 295.2 |
| Leningrad Oblast | 0.015 | 0.044 | 0.083 | 193.3 | 453.3 |
| Arkhangelsk Oblast | 0.017 | 0.048 | 0.082 | 182.4 | 382.4 |
| Vologda Oblast | 0.017 | 0.046 | 0.059 | 170.6 | 247.1 |
| Kaliningrad Oblast | 0.011 | 0.031 | 0.058 | 181.8 | 427.3 |
| Republic of Karelia | 0.016 | 0.035 | 0.056 | 118.8 | 250.0 |
| Novgorod Oblast | 0.012 | 0.032 | 0.056 | 166.7 | 366.7 |
| Pskov Oblast | 0.008 | 0.020 | 0.035 | 150.0 | 337.5 |

* Ranked in descending order by the index value in 2010.
Calculated on the basis of Rosstat data: [12, 13, 14, 15].

That is, obviously, natural against the background of positive dynamics of the gross regional product in the district (4.5 times increase during the period under review: from 63297.1 to 286827.7 rubles/person). However, as follows from the table 5, the index values of GRP per capita in the NWFD regions (excluding Nenets AO) are very low, as an extremely high maximum value, based on the actual registered in 2010 GRP per capita in Nenets AO, is used in the calculations.

The highest growth rates of this index in 2002–2010 are characteristic of Nenets AO, as well as of the Leningrad and Kaliningrad oblasts, that is primarily related to the increase in investments in the fixed capital of the basic sectors in these regions. Investment demand growth in oil and gas complex was crucial in Nenets AO, while investment demand growth in machine building was critical for the Leningrad and Kaliningrad oblasts. On the whole, the Northwestern Federal District is

characterized by a fairly high level of investment activity. In 2010 the volume of investments in the fixed capital in the district made up 1049.6 billion rubles, which is by 5.8% more than in the previous year. The share of NWFD accounted for 11.5% of the total investment volume in fixed capital of the Russian Federation. The flow of foreign investments per one resident of the district in 2010 amounted to 685.6 US dollars. According to this indicator, NWFD occupies the 3rd place behind the Central and Far Eastern Federal Districts. Saint Petersburg, the Leningrad Oblast and Nenets AO are the leaders in the volume of received foreign investments [16].

The Komi Republic permanenty maintains the 2nd place behind Nenets AO. Due to the favourable investment climate, Saint Petersburg pressed the Murmansk Oblast from the 3rd place in 2002–2010. The Leningrad and Kaliningrad oblasts improved their positions significantly. Along with the Murmansk Oblast, the positions of the Republic of Karelia, the Vologda and Novgorod oblasts deteriorated in terms of the index level. The ranking positions of the Arkhangelsk and Pskov oblasts are relatively stable. But while the first is in the middle of the array, the second one is firmly in last place. However, it should be highlighted once more that the index of GRP per capita increased significantly in all the regions for the 2002–2010 period, including 2.5 times in the Republic of Karelia and the Vologda Oblast.

The index of capital-labour ratio also increased considerably in the North-West for 2002–2010: 2.5 times (0.026 to 0.067) *(tab. 6)*. The growth was characteristic of all the district's regions, except for the Vologda Oblast, where the index of capital-labour ratio decreased by 62% in the period under review. As a result, the Vologda Oblast fell from the 1st in the district to the 6th place. However, it should be noted that a significant decrease in the index of capital-labour ratio in the Vologda Oblast took place at the first stage, while some growth was observed in the 2006–2010 period. The maximum increase in the index of capital-labour ratio (more than 10 times) is characteristic of Nenets AO that rose from the 2nd to the 1st place in the array of the NWFD regions in the 2002–2006 period, that is connected with the beginning of the active development of the already opened, but formely suspended raw hydrocarbon deposits. The Komi Republic, where the index increased 3.5 times, moved from the 3rd to the 2nd ranking position.

Table 6. Dynamics of the index of capital-labour ratio in the subjects of the Russian Federation, constituting NWFD, in 2002–2010*

| RF subjects | Index value | | | Growth rates, % | |
|---|---|---|---|---|---|
| | 2002 | 2006 | 2010 | for 2002–2006 | for 2002–2010 |
| *NWFD* | *0.026* | *0.037* | *0.067* | *42.3* | *157.7* |
| Nenets AO | 0.049 | 0.130 | 0.507 | 165.3 | 934.7 |
| **Komi Republic** | **0.038** | **0.077** | **0.133** | **102.6** | **250.0** |
| Murmansk Oblast | 0.025 | 0.046 | 0.092 | 84.0 | 268.0 |
| Arkhangelsk Oblast | 0.026 | 0.044 | 0.088 | 69.2 | 238.5 |
| Leningrad Oblast | 0.024 | 0.041 | 0.082 | 70.8 | 241.7 |
| Vologda Oblast | 0.180 | 0.039 | 0.069 | -78.3 | -61.7 |
| Republic of Karelia | 0.020 | 0.035 | 0.058 | 75.0 | 190.0 |
| Saint Petersburg | 0.014 | 0.029 | 0.053 | 107.1 | 278.6 |
| Novgorod Oblast | 0.018 | 0.030 | 0.045 | 66.7 | 150.0 |
| Kaliningrad Oblast | 0.013 | 0.021 | 0.042 | 61.5 | 223.1 |
| Pskov Oblast | 0.016 | 0.025 | 0.037 | 56.3 | 131.3 |

* Ranked in descending order by the index value in 2010.
Calculated on the basis of Rosstat data: [12, 13, 14, 15].

The Murmansk Oblast with even more significant growth of the index of capital-labour ratio pressed the Arkhangelsk Oblast and took the 3rd place. High growth rate is also typical for Saint Petersburg that rose from the 10th to the 8th place for the 2002–2010 period. Along with the Vologda Oblast, the Pskov and Novgorod oblasts worsened their positions in comparison with 2002, although the index of capital-labour ratio for 2002–2010, increased in these regions more than 2 times.

Thus, the positive dynamics of the integral index of labour potential development in the Northwestern Federal District in 2002–2010 is ensured by the dynamics of all five subscripts in practically all regions. The exception is the index dynamics of the capital-labour ratio in the Vologda Oblast, characterized by significant reduction (almost 80%) in the 2002–2006 period and the zero dynamics of the employment index in the Arkhangelsk Oblast and the Republic of Karelia for 2002–2010 as a whole. The index of GRP per capita increased 4.8-fold in the district for 2002–2010, and the index capital-labour ratio increased 2.6-fold contributing most to the ILPD growth.

However it should be noted that the values of these indices in the regions of the Northwestern Federal District, except for Nenets AO, are rather insignificant (less than 0.1 in most regions). In other words, the values of these indices made small contribution to the ILPD level of the regions. A much more significant contribution is made by close to the maximum index of working life expectancy, the index rate of vocational training of the employed population (about 0.8 for the district) and the population employment index (about 0.65). At the same time, the population employment index is characterized by insignificant increase of 8% over the 2002–2010 period in many ways resulting from the consequences of the global financial crisis, when many companies were forced to pursue the policy of reducing personnel due to the difficult economic situation. The employment rate reached its peak in 2007–2008 in NWFD (67.5% of the population aged 15–72 years) rather deep recession was observed in 2009, but the growth has been recorded again in subsequent years, pointing to the growth of the population employment index in the long term.

In 2002, the integral index of labour potential development was above the average for the district in three regions of NWFD out of the eleven (Saint Petersburg, the Vologda Oblast and Nenets AO). Yet in the 2002–2006 period, the Vologda Oblast dropped out due to significant decrease in the index of capital-labour ratio. Thus, the level of the index of labour potential development of the Northwestern Federal District was in fact defined in 2010 only by two regions: "capital of the North" and the region, the economy of which is based on hydrocarbon production that, on the one hand, requires significant capital-labour ratio, and on the other hand, ensures high level of GRP per capita.

The Komi Republic somewhat improved its position in the array of NWFD regions by the ILPD value, rising from the 6th to the 5th place for 2002–2010, primarily due to the growth of the index of the capital-labour ratio, which increased 3.5-fold in the Komi Republic – the region rose to the 2nd place following Nenets AO in 2002–2006. The growth rate of the index of GRP per capita, by the level of which the Republic steadily holds the 2nd place following Nenets AO, and the population employment index in the Komi Republic are also above average for the Northwestern Federal District. Largest last the Komi Republic still occupies low-ranking 7th place. At the same time it comes to the attention that the employment index in the Komi Republic, started to grow significantly only in recent years (see tab. 4) that is encouraging in the long term.

The increase rate of the index of professional education of the employed population in the Republic is below average for the District: by this level the Komi Republic fell from the 4th to the 5th-6th-7th place in the 2002–2010 period. It is related to the transition of the Republic to "self-supporting with qualified personnel" in the 1990s, the ageing of the professional staff previously trained in higher education institutions of the capital, the attainment of age limit and gradual termination of labour activities, as well as high levels of migration outflow of the young people, who had received education in the Republic, to Saint Petersburg and Moscow. And, finally, the growth rate of the index of the working life expectancy in the Komi Republic is below average for the Northwestern Federal District (decline from the 5th to the 7th position), resulting from insufficient increase of the population life expectancy in the Republic in the 2000s, characterized by the significant rate of mortality from external causes.

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# Small business as the factor increasing the employment rate and incomes of the population*

*Small and medium business is the most important source of increasing employment and incomes of the population. The statistics show that at present the potential of this sphere is not used to the fullest extent in Russia. In order to overcome the existing difficulties, involve the population in business, it is necessary to implement a set of measures aimed at the improvement of the business climate and the disclosure of the population's entrepreneurial potential. Furthermore, an important step is the development and adoption of the concept of the long-term development programme of small and middle business in the region.*

*Small and medium business, region's economy, entrepreneurial abilities of the population.*

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The priority goal of Russia's socio-economic development is to improve the quality and standards of living of the population. In order to reach the goal it is necessary to overcome the most acute problems of low living standards of the population, unemployment, high level of social differentiation. Thus, according to Rosstat, in 2011 about 13% of the population (18.1 million people) had incomes below the subsistence level [14], in the Vologda Oblast – 17.8% (213.6 thousand people [15]).

In compliance with the results of ISEDT RAS sociological surveys, the percentage of the poor is even higher: 38% of the region's residents consider themselves to be poor, 53% have money only for buying essentials[1]. Thus, living standards of the majority of citizens are quite low.

The development of small business is one of the factors allowing the income of the population to be increased. It is small business that forms the basis for the formation of middle class, therefore, it facilitates the weakening of the trend to social differentiation that is inherent in the market economy.

As follows from the official data, the country's unemployment amounted to 6.5% in 2012, meaning that about 5 million of the Russians, 45% of who are women, had no job [17]. The average age of the unemployed made up 35 years old. According to the author's research,

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[1] According to the 2011 ISEDT RAS survey.

that is the age, when the population has the highest entrepreneurial potential.

Nevertheless, business income accounts for only 8.9% (in 2011) in the structure of the money income of the Russian population, that is by 7.5% lower than in 1995 *(tab. 1)* indicating that small business potential is not used to the fullest extent. In the Vologda Oblast this indicator slightly increased – up to 10.6% in the period under review. It should be noted that this is the highest indicator among the indicators of the regions of the Northwestern Federal District and Russian Federation in 2011, exceeding the average for the district and the country by 5.5% and 1.7% respectively.

As is known, small business performs the important function of "means of social mobility". A man of enterprise, using his/her abilities, can set up business and raise his/her social status and quality of living without anyone's assistance. The policy of stimulating small business will make it possible to reduce the unemployment rate, to increase the citizens' incomes. The role of small and medium business is rather important in some countries, when addressing these issues, and the wellbeing of a considerable part (or even the majority) of the population depends on the stable development of this economic sector *(tab. 2)*.

Table 1. Share of business income in the structure of the money income of population (as a percentage of the total money income)

| Territory | Year | | | | | Absolute deviation in 2011 – 1995 |
|---|---|---|---|---|---|---|
| | 1995 | 2000 | 2005 | 2010 | 2011 | |
| **Vologda Oblast** | **10** | **10.1** | **10.1** | **11.7** | **10.6** | **0.6** |
| Arkhangelsk Oblast | 17.5 | 14.8 | 10.5 | 10 | 9.5 | -8 |
| Pskov Oblast | 18.3 | 14 | 13.8 | 9.3 | 8.3 | -10 |
| Novgorod Oblast | 13.2 | 18.2 | 13.7 | 8.9 | 7.6 | -5.6 |
| Leningrad Oblast | 15.7 | 8.6 | 9.7 | 6.4 | 7.6 | -8.1 |
| Komi Republic | 8.2 | 17 | 10.5 | 7 | 6.3 | -1.9 |
| Republic of Karelia | 13.6 | 13.9 | 13.6 | 5.3 | 6.0 | -7.6 |
| Kaliningrad Oblast | 14.9 | 10.7 | 5.5 | 5.3 | 6.0 | -8.9 |
| Murmansk Oblast | 13.7 | 17.3 | 13.7 | 7.3 | 5.4 | -8.3 |
| Saint Petersburg | 18.4 | 11.2 | 4 | 2.2 | 2.0 | -16.4 |
| RF | 16.4 | 15.4 | 11.4 | 9.3 | 8.9 | -7.5 |
| NWFD | 15.4 | 13 | 7.7 | 5.4 | 5.1 | -10.3 |
| Source: Official website of the Federal State Statistics Service. Available at: http://www.gks.ru | | | | | | |

Table 2. Contribution of small and medium enterprises (SME) to the economy of some countries of the world

| Indicator | Japan | Thailand | UN | USA | China | Russia |
|---|---|---|---|---|---|---|
| SME share in the total number of organizations % | 99.7 | 99.8 | 99.8 | 99.7 | 99.8 | 33.3 |
| Share of SME employees in the total number of the employees of all enterprises, % | 70.0 | 75.4 | 69.7 | 50.3 | 82.0 | 20.9 |
| Sources: Conditions for small-business development using the example of Russia and China. Available at: http://www.rppe.ru/wp-content/uploads/2011/05/radchenko-mv-sokolova-gv.pdf); Small business in China. Available at: http://www.kapitalpress.ru/ kapitalist/archive/2007/19/635/; Business in the region: current state, perspectives: monograph. Terebova S.V., Podolyakin O.V., Egorikhina S.Yu. Vologda: ISEDT RAS, 2011. | | | | | | |

Much attention has been paid to the development of small business in our country. Thus, rather extensive system of state and public support for this economic sector was formed at the regional level in the years of reforms. Institutional infrastructure aimed at securing favourable environment for the formation and development of small enterprises, providing them with the services they are unable to purchase in the market, or the services that the market does not offer due to their key points, has been taking shape [10]. For this purpose, 124.5 billion rubles were allocated from the federal budget to the country's regions in the last three years; it is planned to allocate another 67.8 billion rubles in 2013–2015.

In the Vologda Oblast the infrastructure support for the subjects of entrepreneurial activities was provided within the framework of the long-term target programme "Development of small and medium businesses in the Vologda Oblast for 2009–2012" with the total amount of funding of 284.6 million rubles [3].

Since 2013 the state programme "Support and development of the Vologda Oblast small and medium businesses for 2013–2016" came into force [2]. In accordance with the programme it is planned to allocate 686 million rubles to the business sector.

Due to the targeted state support the number of small enterprises in the region increased almost twice in the 2000–2012 period *(tab. 3)*. Most of them (75%) are concentrated in large cities: Vologda (43%) and Cherepovets (32%).

Official data [17] show that the coefficient of the launching of small enterprises has been steadily decreasing in the 2005–2011 period[2]. The balance between the given coefficient and the shutdown coefficient remains positive, though demonstrating the dynamics of decrease. If such trends remain further, no measures appropriate for their elimination are adopted, small business will be likely to reach the critical moment, when more enterprises will be closed down than opened, which will negatively affect the employment in this economic sector.

Table 3. Number of small enterprises (units per 100 thousand people)

| Territory | 2000 | 2005 | 2008 | 2010 | 2011 | 2012* | 2012 as compared to 2000, % |
|---|---|---|---|---|---|---|---|
| Saint Petersburg | 2309.5 | 2494.4 | 2767.4 | 2381.6 | 3401.8 | 3296.9 | 142.8 |
| Kaliningrad Oblast | 793.2 | 955.0 | 2324.6 | 2963.7 | 2046.8 | 2027.4 | 255.6 |
| Republic of Karelia | 546.3 | 656.9 | 686.9 | 2209.3 | 1416.4 | 1421.8 | 260.3 |
| Komi Republic | 380.8 | 454.2 | 861.3 | 2416.6 | 1276.7 | 1303.3 | 342.3 |
| Novgorod Oblast | 419.9 | 373.3 | 686.7 | 2396.7 | 1142.1 | 1142.8 | 272.2 |
| Arkhangelsk Oblast | 347.9 | 369.8 | 701.6 | 1934.3 | 1029.4 | 1038.7 | 298.6 |
| Pskov Oblast | 355.5 | 520.1 | 445.4 | 2281.8 | 926.0 | 929.5 | 261.5 |
| Leningrad Oblast | 712.8 | 709.8 | 864.8 | 1603.2 | 880.1 | 841.9 | 118.1 |
| **Vologda Oblast** | **453.2** | **388.7** | **522.6** | **831.1** | **825.3** | **834.7** | **184.2** |
| Murmansk Oblast | 311.2 | 347.2 | 663.1 | 2061.7 | 748.2 | 774.1 | 248.7 |
| NWFD | 1100.8 | 1198.3 | 1515.6 | 1131.6 | 1868.2 | 1902.6 | 172.8 |
| RF | 601.0 | 686.0 | 949.7 | 868.0 | 1276.1 | 1283.6 | 213.6 |

* Data for January–September of 2012.

Sources: Official website of the Federal State Statistics Service. Available at: http://www.gks.ru; Unified interagency information and statistical system. Available at: http://fedstat.ru; Small and medium business in Russia. 2009: statistical digest. Rosstat. Moscow, 2009.

[2] In the course of its implementation entrepreneurs received support in the following areas: financial sphere (grants on starting up one's own business, implementation of innovation projects; subsidies for paying interest on loans, leasing payments; the Guarantee Fund and the Fund for Resource Support of Small and Medium Entrepreneurship were established); support of foreign economic activity (the Euro Info Correspondence Centre was established; grants for export-oriented enterprises are allocated); provision of office premises (on the basis of the "Business Incubator"); information and advisory services, training.

Table 4. Average number of employees of small enterprises (excluding micro-enterprises), thousand people

| Territory | 2000 | 2005 | 2008 | 2009 | 2010 | 2011 | 2012* | 2012 as compared to 2000, % |
|---|---|---|---|---|---|---|---|---|
| Saint Petersburg | 628 | 633 | 698.2 | 630.7 | 522 | 630 | 350.7 | 55.8 |
| **Vologda Oblast** | **65** | **62** | **82.4** | **66.9** | **55.2** | **51.3** | **67.9** | **104.5** |
| Leningrad Oblast | 117 | 139 | 135.8 | 120.7 | 89 | 118 | 59.5 | 50.8 |
| Arkhangelsk Oblast | 31 | 32 | 70.3 | 58.1 | 81 | 74 | 57.2 | 184.5 |
| Kaliningrad Oblast | 52 | 105 | 120.7 | 103.5 | 91 | 68 | 54.4 | 104.6 |
| Komi Republic | 29 | 50 | 77.1 | 69.3 | 68 | 52 | 41.7 | 143.8 |
| Pskov Oblast | 25 | 35 | 45.4 | 42.2 | 55 | 44 | 41.4 | 165.6 |
| Republic of Karelia | 28 | 32 | 38.0 | 43.3 | 52 | 49 | 38.7 | 138.2 |
| Novgorod Oblast | 29 | 38 | 50.3 | 41.9 | 49 | 46 | 37.5 | 129.3 |
| Murmansk Oblast | 25 | 31 | 40.1 | 38.3 | 57 | 39 | 32.2 | 128.8 |
| NWFD | 1028 | 1155 | 1367.6 | 1214.8 | 1162 | 1197 | 785.4 | 76.4 |
| RF | 6597 | 8045 | 11412 | 10247.5 | 11097 | 9692 | 6758.2 | 102.4 |

* Data for January–September of 2012.
Sources: Official website of the Federal State Statistics Service. Available at: http://www.gks.ru; Unified interagency information and statistical system. Available at: http://fedstat.ru; Small and medium business in Russia. 2009: statistical digest. Rosstat. Moscow, 2009.

The number of employees of small enterprises increased in the 2000–2008 period *(tab. 4)*. However, in 2009–2011 it reduced by 23%, i.e. more than 15 thousand people. One of the reasons for such dynamics is the financial and economic crisis that began in September of 2008 and led to increased tariffs, while at the same time reducing the demand for products/services of enterprises. The policy of the tax authorities with regard to the subjects of small business has not changed at that. Moreover, in compliance with the Federal Law "On the development of small and medium enterprises in the Russian Federation" [1], since 2008 micro-enterprises (with the personnel of 15 people) were singled out of small enterprises (with number of employees from 16 to 100 people), that also facilitated the reduction in the number of employees in the "small enterprises" group.

The largest number of the employed in small business is concentrated in the sphere of trade (25.4%), real estate operations (18.1%), manufacturing industry (17.5%). Such distribution of employees corresponds to the structure of small business, which is characterized by low level of diversification: basic share of trade and real estate operations, totally amounting to over 50% [17]. Low costs and high turnover of capital above all accounts for the attractiveness of this sector of activity.

In the period under review the following changes occurred in the distribution of the number of employees of small enterprises by types of economic activities *(tab. 5)*. The number of the employed increased by 8% at the enterprises engaged in operations with real estate, lease and rendering of services, but on the contrary decreased in construction and agriculture by 8% and 6%, respectively. These transformations are the consequence of changes in the structure of small business.

Thus, the number of enterprises engaged in operations with real estate, lease and rendering of services increased by 7% in 2012, as compared to 2005, which is probably related to the state policy of reforming housing and utility sector. Due to the new Housing Code enacted in 2005, the approaches to managing the housing and utility complex have been radically changed. Self-management (Homeowners Association) was declared inefficient and was replaced by professional management represented by private management companies [13] that promoted the emergence of small business in housing and utility sector.

Table 5. Distribution of the number of employees of small enterprises by types of economic activities, %

| Types of economic activities | Year | | | | Absolute deviation in 2012 – 2005 |
|---|---|---|---|---|---|
| | 2005 | 2008 | 2011 | 2012* | |
| Wholesale and retail trade; repair of vehicles, motorcycles, household goods and personal appliances | 22.6 | 21.9 | 26.7 | 25.4 | 2.8 |
| Operations with real estate, lease and rendering of services | 10.5 | 10.5 | 14.9 | 18.1 | 7.6 |
| Manufacturing | 19.4 | 17.3 | 18.4 | 17.5 | -1.9 |
| Building | 20.8 | 23.7 | 12.4 | 13.1 | -7.7 |
| Agriculture, hunting | 14.8 | 13.3 | 11.6 | 9 | -5.8 |
| Transport and communication | 6.4 | 5.4 | 5.4 | 6 | -0.4 |
| Hotels and restaurants | 1.1 | 2.8 | 4.4 | 5 | 3.9 |
| Production and distribution of electricity, gas and water | 0.6 | 1.1 | 2.93 | 3.1 | 2.5 |
| Healthcare and social services | 0.8 | 0.5 | 0.9 | 1.2 | 0.4 |
| Provision of other housing, social and personal services | 2.1 | 2.6 | 1.32 | 1 | -1.1 |
| Financial activities | 0.3 | 0.3 | 0.5 | 0.22 | -0.08 |
| Mining | 0.0 | 0.2 | 0.32 | 0.2 | 0.2 |
| Education | 0.1 | 0.1 | 0.12 | 0.1 | 0 |
| Fishing, fish breeding | 0.5 | 0.3 | 0.11 | 0.08 | -0.42 |
| TOTAL | 100 | 100 | 100 | 100 | |

* Data for January–September of 2012.
*Sources:* Small business of the oblast: statistical digest. Vologdastat. Vologda, 2008; Small business of the oblast: statistical digest. Vologdastat. Vologda , 2009; Small business of the Vologda Oblast in January–September of 2012.

Moreover, the growing number of enterprises in this sphere is connected with the development of real estate market (including realtor services).

The number of small enterprises in the sphere of construction and agriculture decreased by 3% and 3.5% respectively. The percentage of shutdown enterprises is lower than the percentage of the employed at these enterprises. This may indicate forced dismissals, pursued by enterprises in order to optimize activities.

Active engagement of employees under the terms of secondary employment is typical of small business. Thus, in 2012 along with workers on payroll, about four thousand of external part-time workers and employees providing work under civil law contracts were engaged at enterprises, accounting for 6% of the total number of employees of small enterprises.

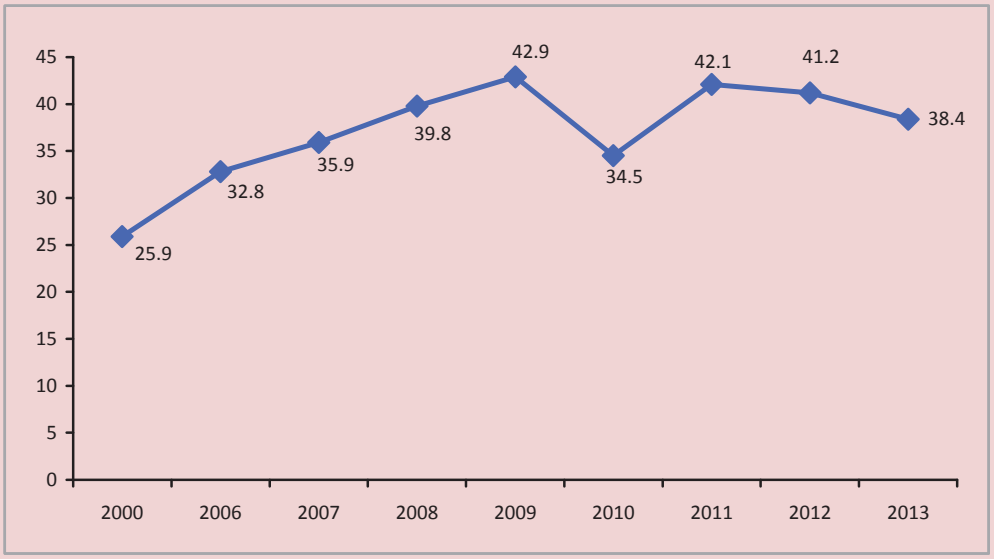
Private entrepreneurs create jobs as well. The number of private entrepreneurs was observed to increase by 66% in the Vologda Oblast for the 2000–2009 period: 17 thousand people set up their own business *(fig. 1)*.

Since 2009, the region has been implementing a programme to reduce labour market tensions, providing arrangements for self-employment of the unemployed citizens.

In 2012 the trend was toward the reduction in the number of private entrepreneurs – over three thousand of unincorporated businesses were shut down in the period from December 2012 to January 2013 alone [4] (for comparison: about 4 thousand over the first half of 2012)[3]. It is most likely related to the fact that social tax burden on small businesses and private entrepreneurs has increased since 2011. Total payroll tax rate made up 34% as against previous 14% from employee wages as social taxes for enterprises, using simplified tax system, and 26%

[3] In the Vologda Oblast the number of new enterprises per 1 thousand of the existing ones decreased by 10% in 2011 as compared to the previous year. The number of officially shut down small enterprises per 1 thousand of the existing ones increased by 63% as compared to 2010, and 2-fold in comparison with the 2008 crisis. It may indicate that small business steps into the shadows, and also that the terms of business operations, in spite of active government support, have worsened since 2008.

Figure 1. Number of actually working private entrepreneurs in the Vologda Oblast, thousand people




Sources: Small business of the Vologda Oblast in 1996–2001: trends and priority directions for further development: research and information note. VSCC CEMI RAS. Vologda, 2002. Available at: http://www.booksite.ru/fulltext/bui/sne/sss/mall/2.htm; Small and medium business in the Vologda Oblast. 2010: statistical digest. Vologdastat. Vologda, 2010; Small business of the Vologda Oblast in January-September of 2012: statistical digest. Vologdastat. Vologda, 2012.

for enterprises, using general taxation system [6]. In addition, the limiting value base for the assessment of insurance payments increased by more than 11% in 2011, and by 11% in 2012 as compared to the previous year.

If the situation is not changed, the process of curtailing activities, small enterprises and unincorporated businesses will be likely to expand, negatively affecting the municipal budget replenishment (55% of private entrepreneurs falls at the districts of the Oblast). Besides, it can lead to the fall in the wages of employees of small enterprises, the living standards of the region's population, aggravation of social tension.

In the 2005– 2008 period the average monthly wages of employees of small enterprises increased by 41% up to 17 thousand rubles *(fig. 2)*. In 2009 it decreased by almost 20% as compared to 2008, due to financial and economic crisis, which resulted in the decline in the companies' turnover.

The highest income is paid to the employees of enterprises, engaged in financial activities, mining operations, although the share of such workers in the total number of employees hardly exceeds 2% *(fig. 3)*. Wages in the sphere of financial activity are two times higher than in agriculture and forestry.

In the wholesale and retail trade, repair of vehicles, motorcycles, household goods and personal appliances, accounting for the highest percentage of employees, the fund of accrued wages is observed to be low – about 12 thousand rubles monthly per one employee.

Throughout the period under review the wage level of employees at small enterprises remains low – only 60% of the average for the region. In the author's opinion, this can be explained by hidden wages, as well as small turnover of small enterprises as compared to big and medium business. In the 2008–2011 period, the turnover per one organization decreased by 13%, capital investments declined 6-fold *(tab. 6)*.

Figure 2. Average monthly wages of an employee at a small enterprise of the Vologda Oblast (in comparable prices for 2012), thousand rubles


* Including microenterprises.
** January–September.
Sources: Official website of Federal State Statistics Service. Available at: http://www.gks.ru; Unified interagency information and statistical system. Available at: http://fedstat.ru

The share of profitable organizations remained the same, however, the profitability of sold goods, being at a low level anyway, fell by more 1.2%. This may indicate an increase in the prime cost of produced products/services rendered, caused by rising energy prices, fuel and lubricants, equipment, as well as due to the use of obsolete equipment and technologies.

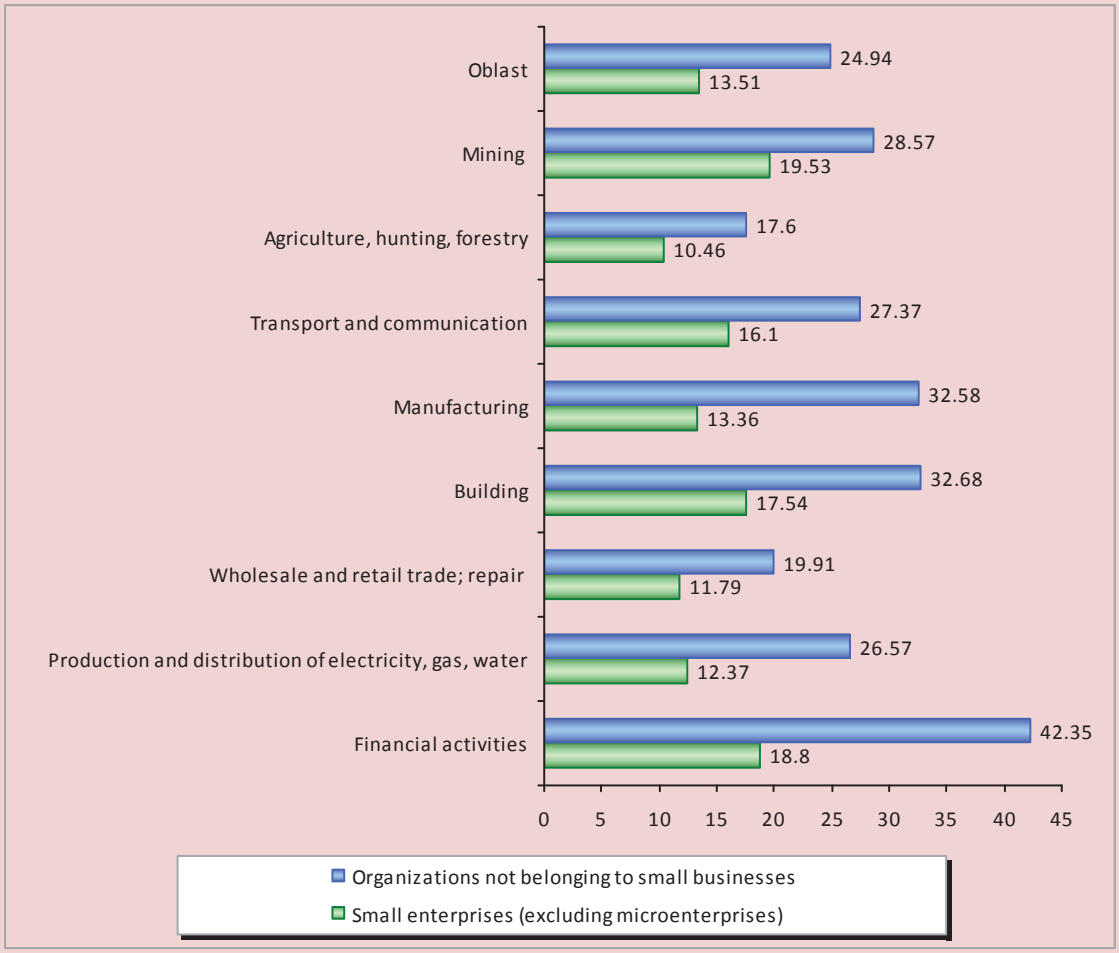
Small enterprises operating in the region, are characterized by high degree of fixed capital depreciation, particularly in mining (59%), transport and communication (44%), construction (43%), agriculture (40%), manufacturing (37%). The decline in investments in small business development, low profitability of enterprises induces the shortage of financial resources for modernization and asset replacement. At the same time, it is problematic to produce competitive products using worn-out equipment. Russia's accession to WTO makes this problem particularly acute since enterprises, in fact, actually end up in the open markets. According to the survey, only 16% of enterprises have high level of competitiveness in the international market[4] [5]. The respondents noted high export duties (37.1%), high cost and duration of customs clearance (35.5%), lack of funds for advertising (30.6%) among the barriers hindering active promotion of domestic product in the international markets.

The revealed tendencies allow concluding that the increase in the number of the region's enterprises is quantitative, not qualitative. The situation in this sphere can be described as crisis one. The absence of favourable business environment seems to be among the main reasons behind it[5].

[4] According to 2012 ISEDT RAS survey, 100 small and medium business entities were examined.

[5] The quality of business environment is determined by two groups of factors: (a) macroeconomic (demand, savings rate, saturation level of local markets, presence of consumer demand for goods and services of enterprises, etc.); b) economic policy (tax regime, administrative barriers, control procedures, the availability of infrastructure, etc.).

Figure 3. Average monthly wages of employees at small enterprises (excluding microenterprises), organizations not belonging to small businesses by separate types of economic activities for 2012, thousand rubles




Source: Small business in the Vologda Oblast in 2012: statistical bulletin. Vologdastat. Vologda, 2013.

Table 6. Indicators for evaluating the financial and economic state of small enterprises of the Vologda Oblast

| Indicator | Unit | Year | | | |
|---|---|---|---|---|---|
| | | 2008 | 2009 | 2011 | Absolute deviation 2011–2008 |
| Share of the enterprises in the total number of organizations | % | 18.3 | 18.9 | 25.3 | 7.0 |
| Turnover of enterprises per one organization | million rubles | 14.9 | 12.1 | 12.9 | -2.0 |
| Investments in fixed capital per one organization | million rubles | 0.54 | 0.17 | 0.09 | -0.45 |
| share of profitable organizations | % | 74.7 | 70.1 | 74.2* | -0.5 |
| profitability of sold goods, products | % | 4.2 | 3.2 | 3.0* | -1.2 |

* 2010 information
Sources: Small business in the Vologda Oblast in 2011: statistical digest. Vologdastat. Vologda, 2012; Financial and property state of small business enterprises in the Vologda Oblast in 2008–2010: statistical digest. Vologdastat. Vologda, 2011.

Table 7. Ways to increase employment and income of the population through the development of small and medium business

| Direction | Measures |
|---|---|
| To involve the population in doing business | Introduction to teaching basics of business activities starting from school, and not only at universities.<br>Arrangement of schoolchildren and student meetings with entrepreneurs.<br>Development and implementation of special programmes for certain categories of citizens (female entrepreneurs; the unemployed, support for young entrepreneurs)<br>Training of potential entrepreneurs in business planning and business skills.<br>Formation of the positive image of an entrepreneur, spread of positive experience in doing business, creation of small business traditions. |
| To support the establishment of new enterprises | Financing of small enterprises start-up capital*, the expediency of its provision on the terms of repayment.<br>Exemption from property and equipment taxes at the initial stage of business development.<br>Assistance in the registration of enterprises.<br>Provision of office space, equipment on attractive terms. |
| To promote the development of the existing small businesses enterprises | Reduction in costs and terms of utility networks connection.<br>Development of private-public partnership when allocating land plots for construction.<br>Development of venture capital financing.<br>Improvement of lease financing mechanisms for small business entities.<br>Entrepreneur development of non-governmental organizations and associations.<br>Increase in small business lending through expanding interest rates subsidies on state programmes. |
| * The programme to reduce tensions in the labour market, providing grants for the setup of one's own business (in the amount of 50 thousand rubles), has been implemented in the Vologda Oblast. However, the allocated amounts are not sufficient for starting business. According to ISEDT RAS survey, the residents of the region consider the sum of about 1.3 million rubles is required for going into business. | |

Comprehensive efforts to improve the quality of business environment, as well as the elaboration of measures to unlock and unleash the entrepreneurial potential of the population are required in order to increase employment and income of the population through the development of small and medium business. According to the author, it is necessary to distinguish the following principal directions of small business development (*tab. 7*).

It is reasonable to implement the reviewed measures in complex, consistently, in the framework of the long-term programme of small and medium business development in the region. The document should be aimed at creating the most comfortable conditions for managing and developing business, as well as for motivation system in order to increase public involvement in small business and to promote the development of the existing enterprises.

The programme should be built on the analysis of the current situation in business sphere. Note that the data published in the official statistics, specifically the number of small enterprises, employees, and turnover and investment volumes are quantitative indicators, but do not allow giving qualitative business characteristic and evaluating the possibilities for its growth. For this purpose it is reasonable to conduct monitoring by such indicators as itemized expenses, the amount of dues and taxes transferred to the budget, etc.

The performance targets of entrepreneurship development, including industry indicators, and small business development plans in the context of municipalities are to be determined in the programme.

The activities in the given directions will contribute to improving the entrepreneurial climate. The better it is in the region, the higher is the number of potential and factual entrepreneurs. Small business development will allow increasing the living standards and social stability in the society, which in turn will promote sustainable economic growth.

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# Russian model of fiscal federalism: competition or cooperation?

*The article presents the characteristic of the Russian model of fiscal federalism, structurally represented by expenditure commitments, tax authorities and financial assistance. The operating effect of the Russian budget model, based on the principles of cooperation with the prevailing elements of centralized management is evaluated. It is noted that the budgets of the subjects of the Russian Federation have wide range of expenditure commitments, but they do not have sufficient financial sources to cover this liability, and the financial assistance mechanism does not even the situation. Defining the type of the Russian model of fiscal federalism as competitive or cooperative will enable the new reforming of inter-budget relations (which is objectively bound to happen) to be adequate and noncontroversial to the principles and characteristics of mature fiscal model, to bring positive results.*

*Fiscal federalism, competition, cooperation, inter-budget relations, expenditure commitments, tax authorities, financial assistance.*

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**Introduction**

One of the most important components of the budget process, being of both economic and socio-political significance, is inter-budget relations. This is especially the case in federal states, which have, as a rule, quite complex patterns of differentiating income and expenditure commitments of the governing bodies of various levels. It is not accidental that it is the state of inter-budget relations that is characterized foremost by the stage of the implementation *of fiscal federalism* principles.

Inter-budget relations have been and still are one of the most rapidly reforming elements of the budget system, but, unfortunately, due to their inconsistency with the principles of the already established pattern of fiscal federalism, not all innovations have been organically incorporated into it. How can this goal be achieved?

To address the issue of the article, the author uses methods of logical, structural-functional, retrospective and comparative analysis of statistical data.

The study algorithm is presented in the following blocks: the system of inter-budget relations, which is most adequately characterized by the fiscal federalism model, is analyzed at first; then, the main model types (competitive and cooperative federalism) are considered; after that, the type, to which the Russian model of fiscal federalism gravitates to, and its specifics are determined.

**Parameters of the fiscal federalism model**

Different approaches to determining qualitative characteristics and the main principles of fiscal federalism models are considered in economic literature.

Most frequently, the basic principles are the following three:

1. Delineation of budgetary *responsibility* between the centre and federal subjects. This refers to the legislative delimitation of spheres of financing expenditures from the budget of one level or another.

2. *Independence* of the budgets of various levels. This principle implies the assignment of own permanent cost funding sources and the right to make decisions about the direction of budgetary funds application to each level of government.

3. *Equality* of all the subjects of the Federation in their financial relations with the centre. This statement does not imply the uniformity of such relations. The subjects may choose this or that type of relations with the centre in compliance with the statutory requirements to these relations.

The principles listed above, formed under the influence of preferences and interests of the different levels of the budget system, give concrete substance to the basic parameters, structurally forming the model of fiscal federalism.

• expenditure commitments – delineation of responsibility between the levels of the budget system on providing the population with public services;

• tax authorities – rules, enduing the conforming levels of government with financial recourses sufficient for the realization of the imposed responsibility;

• financial assistance – the system levelling vertical and horizontal imbalances caused by the mismatch of expenditure obligations and tax authorities through inter-budget transfers to ensure equal access of the citizens to public services throughout the country .

Two models of the system organization of inter-budget relations (competitive and cooperative) are singled out, depending on the order of identifying these parameters and interaction between them.

In the *competition* model "rules of the game" are determined by each party independently. The competition for mobility resources exists between the federal subjects by means of establishing the most favourable rules of the game. In the *cooperation* model "rules of the game" are formulated by all participants (federal and sub-federal authorities) conjointly.

**Competition and cooperation model of fiscal federalism**

The *competition* model concept was firstly presented in the work of the Canadian scientist A. Breton [4]. It was noted that the participants of federal relations (centre and sub-federal governments) should adapt to the changing conditions. Labor and capital are resilient, and the owners of these production factors can choose the most favourable rules of the game, using the procedure of election (federal, regional and local), to change the place of residence or legal address of the organization, to concentrate activities in the regions with the most favorable conditions. Regional and local authorities, in turn, provide companies and population of the territory with certain public goods in exchange for collected taxes that serve as a kind of prices paid by service consumers. The task in this case is to develop the system of rules on competition between the authorities.

The main features of the competition fiscal model are the following:

– high degree of the management decentralization;

– high degree of financial independence and self-determination of the regional authorities;

– clear distinction and assignment of relevant taxes and profits to each level of the budget system;

– little interest of the central government in the policy levelling horizontal imbalances, poor development of the fiscal equalization system in general: as a rule, federal funds are provided in the form of target transfers on financing specific programmes or needy population categories.

USA is often cited as the example of the country with a competition fiscal model.

Well-known German economist Horst Siebert [1] defined *the cooperation model of fiscal federalism* as a negotiating model implying that each time all parties gather and come to an agreement, concerning, in particular, the division of revenue sources and expenditure obligations. According to Siebert, cooperation models have significant disadvantage: a compromise in the negotiations between the centre and the federal subjects is always achieved by infringing the interests of future generations, as they are not able to take part in these negotiations.

The main features of the cooperation fiscal model are the following:

– significant interest of the regional authorities in the functions of national income redistribution of macroeconomic stabilization, which results in greater fiscal cooperation of central and regional government institutions;

– share participation of different levels of government in major national taxes;

– active policy of horizontal fiscal equalization and, consequently, enhanced responsibility of the centre for subnational public finances (which leads to the strengthening of control on the part of the centre and certain restriction of the independence of regional authorities);

– confirmation of the territorial justice as the priority one.

The cooperation model has developed most in Germany.

The competition model largely contributes to economic efficiency, the cooperation model is aimed primarily at the fiscal equalization of regional imbalances, i.e. at the territorial justice.

The cooperation model of fiscal federalism is more appropriate for resolving national issues (national defense, nationwide infrastructure development, large-scale social projects, etc.), for levelling interregional differentiation, whereas the competition model is more preferable for ensuring sustainable economic growth, considering the local specifics, when organizing the public sector *(tab. 1)*.

Note that neither cooperation, nor competition models exist in pure form. On the one hand, it is impossible to establish universal uniform rules of the game, the subjects, for which certain assumptions and/or supplements are made, will always remain; hence, there will be competition for special conditions in the national regulations. On the other hand, even the federal subjects that are absolutely independent from each other and from the federal centre will have to negotiate on the establishment of the game rules, affecting the interests of the state as a whole.

Thus, speaking of the competition or cooperation model of fiscal federalism in any country, it is necessary to take into account that this refers to the prevalence of one or another principle, when building the inter-budget relations. In this regard, the representatives of the competition or cooperation model are not "pure" types, but the countries, in which these two principles are most pronounced.

Table 1. Comparative characteristic of competition and cooperation of fiscal federalism

| Comparison element | Competition model | Cooperation model |
|---|---|---|
| Distribution of authority | Clear distribution of authority<br>Autonomy of the federal centre and the subjects of the federation (subjects) | Despite clear distribution of authority, the centre intervenes in the subjects' activities<br>Co-decision principle is often used<br>The centre considers the subjects' interests<br>The subjects keep to the federal norms and standards |
| Tax system | The subject may impose and collect its own taxes | Unified system of imposing and collecting taxes |
| Budget expenditures | The subject determines the directions of spending funds | Spending of the subjects' funds is based on social standards<br>Subjects fund the obligations established by the centre |
| Inter-budget transfers | Low share of inter-budget transfers in the budget revenues of subjects<br>Lack of subsidies for horizontal equalization<br>Absence of federal mandates | High share of inter-budget transfers in the budget revenues of subjects<br>Import role of horizontal and vertical equalization<br>Considerable extent of federal mandates and/or acute problem of non-financed federal mandates |

**Russian model of fiscal federalism**

Let us consider the Russian model of fiscal federalism in the context of the above parameters (expenditure commitments, tax authorities and financial assistance), and find out the peculiarities of its structure and functioning.

***Expenditure commitments.*** The quantitative estimate of the distribution of expenditure commitments by the levels of the budget system points to almost equal participation of the centre and the regions in the formation of the expenditure side of the country's consolidated budget, and this proportion remains time-stable. A slight decrease in the share of expenditures of the consolidated regional budgets in the country's consolidated budget in 2009–2010 is caused by the negative impact of the financial crisis on the budget proportions *(tab. 2)*.

The qualitative assessment of expenditure obligations emanating from the assumption that the entitlement to spend funds does not always imply the entitlement to administer the funds, points to the reduction in the number of functions assigned to the federal level in the chain "statutory regulation – financial support – performance of public functions". The situation is the reverse for regional and local authorities: they are little involved in the statutory regulation, but at the stages of financial support and performance their role is proportionate to legal responsibility.

Social responsibility sphere vividly illustrates the mismatch of expenditure commitments between the levels of the budget system. The bulk of social obligations (education, health, social policy) is entrusted to sub-federal budgets that comprise half of total expenditures; furthermore, the legal regulation of social issues and standard setting in this sphere of state responsibility is the prerogative of the federal centre *(fig. 1)*.

The characteristics of expenditure commitments demonstrate that the Russian model of fiscal federalism gravitates to the cooperation model, emphasizing the prevalence of centralized management[1]:

- indeterminate list of expenditure commitments of each level of the budget system;
- prevalence of "co-decision principle";
- assignment of expenditure commitments to lower levels without funds reinforcement;
- *spending based on the centre-established standards.*

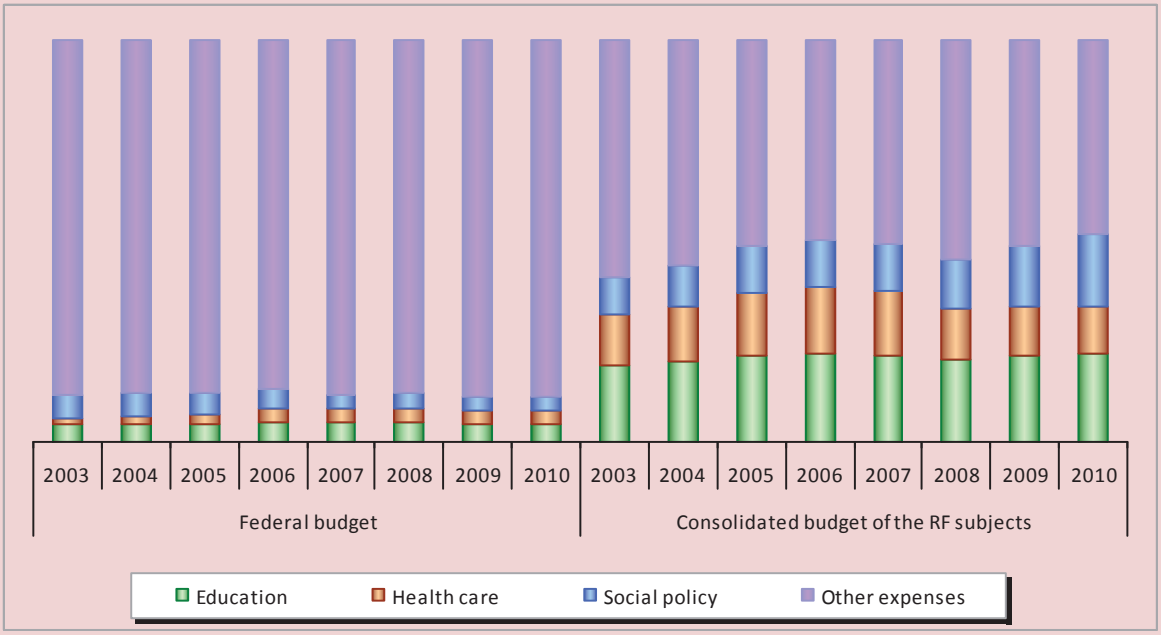
[1] Parameters inherent in the cooperation model of fiscal federalism are in italics.

Table 2. Dynamics of the share of expenditure commitments of the subjects of the Russian Federation in 1995–2010, %*

| 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|
| 50.8 | 52.5 | 55.8 | 50.2 |
| **1999** | **2000** | **2001** | **2002** |
| 52.0 | 52.7 | 55.0 | 49.3 |
| **2003** | **2004** | **2005** | **2006** |
| 50.0 | 50.8 | 43.1 | 43.7 |
| **2007** | **2008** | **2009** | **2010** |
| 44.5 | 45.2 | 39.3 | 39.6 |

* Expenditure commitments are calculated as the share of the expenses of the federal subjects' consolidated subjects in the consolidated RF budget, %.
Sources: laws on implementing the federal budget of the Russian Federation; Rosstat: www.gks.ru [2]; author's calculations.

Figure 1. Structure of the distribution of social responsibility between federal and regional levels, %




Source: laws on implementing the federal budget of the Russian Federation; Russia's regions [3].

Structural incompleteness of expenditure commitments distribution – indeterminate list of expenditure powers– is expressed in the predominance of state activities that are in the joint jurisdiction of various levels of government. Under the conditions of such a vague hierarchy the responsibility is diluted between the levels of public administration, when rendering services to the population and, as a consequence, informal practices destabilizing the budget system are spreading.

***Tax authorities.*** In order to analyze tax authorities, let us consider the structure of the consolidated budget of the Russian Federation and its dynamics for a number of years (*tab. 3*).

In terms of revenue powers sphere the period under review is clearly divided into three sub-periods. While in 1995–1999 the share of the consolidated budgets of the federal subjects in the consolidated budget of the Russian Federation was observed to increase, the role of sub-federal budgets in the formation

Table 3. Dynamics of the revenue powers share of the subjects of the Russian Federation, %*

| | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|
| Revenues** | 46.7 | 49.1 | 50.4 | 51.5 |
| Tax revenues | 43.2 | 45.5 | 46.6 | 45.3 |
| | **1999** | **2000** | **2001** | **2002** |
| Revenues** | 48.0 | 46.0 | 41.2 | 39.0 |
| Tax revenues | 41.0 | 35.4 | 33.0 | 31.3 |
| | **2003** | **2004** | **2005** | **2006** |
| Revenues** | 39.7 | 40.3 | 29.8 | 30.0 |
| Tax revenues | 32.4 | 32.9 | 27.9 | 27.8 |
| | **2007** | **2008** | **2009** | **2010** |
| Revenues** | 33.2 | 32.3 | 32.5 | 33.9 |
| Tax revenues | 24.2 | 28.3 | 28.5 | 30.2 |

* Revenue powers are estimated as the share of tax and other revenues of the consolidated budgets of the federal subjects in the consolidated budget of Russia, %.
** Without considering financial assistance from the federal budget.
Sources: laws on implementing the federal budget of the Russian Federation; Rosstat of Russia: www.gks.ru [2];author's calculations.

of the consolidated budget has been decreasing since 2000 and the structure of the country's consolidated budget has changed since 2008, due to the effect of the financial crisis that led to a decrease in the revenues of the federal budget. At the same time, the rate of tax authorities reduction (14%) is higher than the decline rate of expenditure burden (10%).

At present in the Russian tax system with regard to basically all taxes, both tax base and tax rates, as well as almost all the other tax elements are specified by the federal legislation. Rights of the federal subjects and local authorities are reduced to the adjustment of tax rates within the centre-established limits.

High level of centralization, particularly in the sphere of tax powers, was always characteristic of Russia. Some exception was relatively short period of the early 1990s, the negative experience of which brought forth the reversal tendency towards the intensification of the federal component in tax sphere. The effect of centralization is evaluated by using the indicator of fiscal capacity, which can be helpful when characterizing the revenue opportunities of the subjects within the existing system of tax powers distribution.

Fiscal capacity[2] of the regions of the Northwestern Federal District (NWFD) at the beginning of the period of the centre whip-hand in tax powers (2000–2002) is characterized by a significant differentiation – 8 regions out of 11 are not even able to reach the average level of fiscal capacity. But since 2007, when the centralization processes have been almost completed, the model of fiscal federalism becomes more or less stable and is not subject to cardinal changes; the situation turns around: 7 subjects "step over" the border of Russia-averaged fiscal capacity indicator, so the differentiation does not seem so profound any more *(tab. 4)*.

Historically familiar to us centralized management, expressed in the shift of emphasis towards the Federation centre in the system of tax powers distribution, led to the narrowing of differences in the revenue opportunities of sub-federal budgets. Regulation of the rules, consistent with the developed principles of the fiscal model, had positive effect on the whole.

[2] In this case fiscal capacity is formed from own sources, i.e. own profits and deductions from regulatory taxes without considering financial assistance from the federal budget .

Table 4. Effect from tax powers centralization*

| Range of fiscal capacity deviation | 2001 | 2002 | 2003 | 2004 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| 0.00 – 0.50 | Arkhangelsk Oblast Kaliningrad Oblast Novgorod Oblast Pskov Oblast | Arkhangelsk Oblast Kaliningrad Oblast Novgorod Oblast Pskov Oblast | Kaliningrad Oblast Novgorod Oblast Pskov Oblast | Kaliningrad Oblast Novgorod Oblast Pskov Oblast | Novgorod Oblast Pskov Oblast | Pskov Oblast | | |
| 0.51 – 0.75 | Vologda Oblast Murmansk Oblast | Karelia Vologda Oblast Murmansk Oblast | Karelia Arkhangelsk Oblast Murmansk Oblast | Karelia Arkhangelsk Oblast Murmansk Oblast | Karelia Arkhangelsk Oblast Kaliningrad Oblast | Novgorod Oblast | Pskov Oblast | Pskov Oblast |
| 0.76 – 1.00 | Karelia Leningrad Oblast | Leningrad Oblast | Vologda Oblast Leningrad Oblast | Leningrad Oblast | Leningrad Oblast | Karelia Arkhangelsk Oblast Kaliningrad Oblast Leningrad Oblast | Karelia Arkhangelsk Oblast Vologda Oblast Kaliningrad Oblast Novgorod Oblast | Karelia Arkhangelsk Oblast Vologda Oblast Kaliningrad Oblast Novgorod Oblast |
| 1.01 – 1.50 | Komi | Komi | Komi | Komi | Komi | Komi Vologda Oblast Murmansk Oblast | Komi Leningrad Oblast Murmansk Oblast | Komi Leningrad Oblast Murmansk Oblast |
| 1.51 – 2.00 | | | Saint Petersburg | Vologda Oblast Saint Petersburg | Vologda Oblast Murmansk Oblast Saint Petersburg | Saint Petersburg | Saint Petersburg | Saint Petersburg |
| Above 2.01 | Nenets AO Saint Petersburg | Nenets AO Saint Petersburg | Nenets AO | Nenets AO | Nenets AO | Nenets AO | Nenets AO | Nenets AO |

* Fiscal capacity deviations before financial assistance of the federal budget were calculated from Russia-averaged value, taken for 1, in order to divide the subjects in clusters .
Source: Ministry of Finance www.minfin.ru; Rosstat www.gks.ru; [2]; author's calculations.

Figure 2. Characteristic of financial assistance by the compensation indicator


The systematization of tax powers characteristics provides the basis for stating the fact that the Russian model of fiscal federalism gravitates to the cooperation model[3]:

- strictly unified tax system;
- widespread use of split taxes;
- prevalence of federal taxes over regional and local taxes in the tax list.

***Financial assistance.*** The structure of financial assistance corresponds to its notion in the cooperation model of fiscal federalism: the conduct of active state policy of the horizontal equalization, the prevalence of non-targeted federal financial support.

Large-scale centralization of tax powers and overrated obligatory commitments of the subjects provoke imbalanced state of the budget system. Financial assistance does not smooth this inconsistency, as evidenced by the compensation indicator[4], which size dropped 3.2 times in seventeen years (1995–2011) *(fig. 2)*.

The reduced amount of federal financial support, provided to sub-federal budgets, is not always conditioned by their improving state. For example, in 10 years (2001–2010) none of NWFD subjects showed sustainable regional budget surplus, however the volume of assistance during these years decreased *(tab. 5)*. The stable list of the regions, receiving federal transfers, is another evidence that the system providing financial assistance is not regulated, and the imbalance of the budget system is not smoothed via transfer mechanism.

The established functioning order of the financial assistance mechanism gave it the following substance[5]:

- assigning significant role to horizontal equilazation;
- sophisticated system of financial assistance;
- prevalence of non-targeted financial assistance.

Overcoming the imbalance of the Russian budget system should not be reduced to mere deficiency payments of regional budgets, shift of expenditure commitments from one level

[3] Parameters inherent in the cooperation model of fiscal federalism are in italics.

[4] Compensation indicator is calculated as the share of funds, returned to the regions in the form of financial assistance, tax profits of the federal budget, %.

[5] Constraints inherent in the cooperation fiscal model are in italics.

Table 5. Performance effect of financial assistance, million rubles*

| RF subject | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| Republic of Karelia | **- 129.6**** | **- 679.5** | **- 1368.3** | **- 438.3** | + 280.7 | **- 1044.4** | **- 1034.4** | **- 365.1** | **- 3402.5** | **- 488.7** |
| Komi Republic | **- 50.2** | **- 2064.8** | **- 942.6** | **- 12.2** | + 973.7 | + 672.6 | + 394.1 | **- 421.9** | **- 1051.4** | + 986.7 |
| Arkhangelsk Oblast | **- 72.7** | **- 385.5** | **- 500.9** | + 227.4 | + 220.1 | + 333.1 | + 2574.5 | **- 4301.2** | **- 6424.3** | **- 219.5** |
| Nenets AO | **- 17.1** | **- 241.7** | **- 6.9** | + 930.2 | **- 612.3** | + 1036.7 | **- 287.2** | **- 559.1** | **- 629** | + 310.7 |
| Vologda Oblast | **- 779.2** | + 42.4 | + 101.8 | + 3567.9 | **- 1722.5** | + 509.7 | **- 147.6** | + 261 | **- 6456.6** | **- 6857.4** |
| Kaliningrad Oblast | + 29.4 | **- 154.3** | **- 394.8** | **- 205.9** | **- 21.7** | **- 160.6** | + 744.6 | + 842.6 | + 2667.8 | **- 2956.5** |
| Leningrad Oblast | + 124.7 | + 663.3 | **- 875.2** | **- 1011.8** | **- 1137.7** | + 2503.9 | + 4010.3 | + 1109.9 | **- 4534.2** | + 2196.1 |
| Murmansk Oblast | **- 522.2** | **- 1177.8** | **- 1258.0** | + 147.8 | **- 20.3** | + 141.7 | + 2129.4 | **- 300.9** | **- 2562.5** | + 2439.6 |
| Novgorod Oblast | **- 77.2** | **- 164.4** | **- 408.2** | **- 12.6** | + 551.9 | **- 286.8** | + 227.4 | **- 1085.6** | **- 1653.4** | **- 3539.1** |
| Pskov Oblast | **- 15.6** | + 318.8 | **- 519.8** | **- 499.6** | + 529.2 | + 1035.1 | + 818.3 | + 505.5 | **- 746.8** | **- 711.3** |
| Saint Petersburg | + 2295.9 | + 1061.3 | **- 1092.5** | + 1250.5 | + 6454.1 | +31961.9 | +18820.1 | **- 16659.9** | **- 6393.9** | **- 11254** |

* The effect from financial assistance for the federal subject id defined here as the revenues and expenditures margin of sub-federal budgets. With positive result (budget is closed in the corresponding year with surplus) – positive effect; with negative result (budget is closed with deficit) – absence of positive effect.
** Negative effect is bolded.
Sources: Rosstat www.gks.ru [2]; author's calculations.

of the budget system to another or insignificant tax adjustments. The search for solutions to the accumulated problems should be systematic, while determining the principles (competition or cooperation ones), on which the model of fiscal federalism is built, allows for adequate and successful reforms.

**Conclusion**

The centripetal tendencies of the budget process, lack of subnational autonomy in financial and political aspects replaced a strange hybrid of the centralized system for allocating the funds and significant political decentralization, formed by the mid-90s, when the style of interrelations between federal and regional authorities was determined in the process of informal bargaining.

In the early 1990s the determination of our country to develop a model of fiscal federalism, based on competition principles, was not successful as the proclaimed principles were extraneous to the characteristics of the system of inter-budget relations, prevailing in the country.

Further innovations and changes resulted in the transition of a budget model to the framework of the cooperation concept at an angle to forming interrelations between the federal centre and the regions, based primarily on centralization principles. Nevertheless, this fact does not eliminate the need to improve inter-budget relations in the country that is the subject of expanding research and efficient practice.

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# Institutional development planning of non-diversified territories

*The article presents development trends of one-company towns, ways of the state support provided to such towns in Russia and abroad. It describes the results of monotown development, obtained with the state support, and presents the planning scheme of the institutional development of a company town.*

*Non-diversified territories, planning, indicators, institutes for development.*

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Each economic crisis (the 1990–1992 crisis at the beginning of market reforms, 1998–1999 crisis during the default period, 2008–2009 crisis at the stage of the world economic crisis) has been significantly disbalancing the economy of territories, especially non-diversified territories, having specific formation and development characteristics. They are most vulnerable to social and economic failures, therefore, they require increased attention from scientists, experts, public authorities.

*According to the experts of the Ministry of Economic Development of the Murmansk Oblast,* monotowns are the localities, in which the population life activity is critically dependent on external factors. Such factors are negatively changed by risk management with regard to the existing life quality of the population, and they can not be compensated only by the managers of municipal enterprises and organizations.

As a rule, a distinctive feature of a monotown is the existence of one dominant company, employing more than a quarter of the town's working population that is often reflected in defining such enterprise as "town-forming" and in the English meaning of the locality itself as a "one-company town"[1].

*A group of scientists under the guidance of Ye.G. Animitsa* states the following in the monograph: "monoorientation is always a risk both at the enterprise level and at the level of a city, region, country. Due to the sharp market decline in demand for products of town-forming enterprises, the proprietors had to reduce production, place employees on administrative leave, or transfer them to part-time employment, part-time working week or even dismiss them. The reduction in production volumes or its suspension (even partial) at town-forming enterprises paralyses the town life.

Monoprofile economy, distortions in the economic structure make any monotown a hostage of one or two town-forming enterprises" [2].

At present, the following problems of monotowns can be highlighted on the example of Sverdlovsk Oblast:

On the whole throughout the Sverdlovsk Oblast the birth rate has decreased since the end of the 1960s to the level, which is slightly lower than the level required for the reproduction of the population. Modern fertility parameters are 2 times lower than it is required for the replacement. The mortality rate exceeds the birth rate, natural decline in the population remains. For example, according to statistics, in the monotown of Karpinsk the fertility rate in 2012, as compared to 2011, fell by 0.4 and amounted to 12.7 per 1000 people, in the city of Kamensk-Uralsky the birth rate remained at the same level – 13.3 per 1000 people.

According to the balance of labour resources, developed by the Sverdlovsk Oblast Ministry of Economy, by 2019 the number of the region's labour resources will be reduced from 2762.9 thousand people (2011) to 2653.3 thousand people (by 109.6 thousand people) due to the reduction in the number of working-age population from 2547 thousand in 2011 to 2385 thousand people in 2019 (by 162 thousand people). The decline in the indicator was caused by the decrease in the share of the working-age population in the total number of the oblast population from 60% to 53% throughout the Sverdlovsk Oblast. As follows from *table 1,* the reduction in the number of working-age population was observed in almost all one-company towns, such as Verkhnyaya Tura, Serov, Krasnouralsk, Kamensk-Uralsky, Severouralsk, Nizhny Tagil.

The trend of the working age population moving to work in other cities is observed in almost all non-diversified territories. The negative migration growth is observed in one-company towns such as Krasnouralsk, Kamensk-Uralsky, Severouralsk, Serov, Verkhnyaya Tura, Karpinsk, Nizhny Tagil *(tab. 2)*.

However, the situation at the town-forming enterprises of monotowns remains problematic.

For example, the total production of JSC Verkhnyaya Tura machine-building plant (former Federal State Unitary Enterprise Verkhnyaya Tura machine-building plant) for the 2007–2011 period was reduced more than twice (from 327 million rubles in 2007 to 160 million rubles in 2011) as the result of the cutback in state defense orders.

In June of 2012 the enterprise was turned into a joint-stock company with 100% of the shareholding of the state-owned corporation. 500 workers of the town-forming enterprise JSC Verkhnyaya Tura machine-building plant, facing the sack, have been temporary employed since July 18, 2012.

Table 1. Number of working-age population of a company town, thousand people
(in brackets– as a percentage of the legal population of the town)

| Town | 2011 | 2012 |
|---|---|---|
| Karpinsk | 17.7 (56.6) | 18.9 (59.4) |
| Revda | 37.6 (59.4) | 38.3 (60.5) |
| Verkhnyaya Tura | **5.8 (60.8)** | **5.0 (54.6)** |
| Serov | **64.1 (59.4)** | **64.1 (59.4)** |
| Krasnouralsk | **14.5 (56.9)** | **14.2 (56.6)** |
| Kamensk-Uralsky | **102.8 (58.7)** | **101.3 (58.2)** |
| Severouralsk | **30.2 (60.3)** | **26.6 (59.8)** |
| Nizhny Tagil | **218.0 (60.1)** | **207.9 (57.4)** |

Table 2. Migratory movement in one-company towns, people

| Town | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|
| | Arrived | Left | Migration gain | Arrived | Left | Migration gain |
| Revda | 1 225 | 1 113 | 112 | 1 487 | 1 335 | 152 |
| Krasnouralsk | **312** | **535** | **-223** | **424** | **628** | **-204** |
| Kamensk-Uralsky | **2018** | **3120** | **-1102** | **2925** | **3634** | **-709** |
| Severouralsk | **507** | **694** | **-187** | **557** | **1084** | **-527** |
| Serov | **1209** | **1330** | **-121** | **1539** | **1731** | **-192** |
| Verkhnyaya Tura | **270** | **306** | **-36** | **182** | **299** | **-117** |
| Karpinsk | 2367 | 1265 | 1102 | **254** | **604** | **-350** |
| Nizhny Tagil | **2693** | **4330** | **-1637** | **4076** | **4688** | **-612** |

The question concerning the state support provided for the organization of the manufacturing of the new types of commercial products has arisen.

The unemployment rate exceeding the average level across the oblast is observed in the majority of one-company towns.

As of April 1, 2013 the average registered unemployment level in the oblast made up 1.4%, the average level of the given indicator in the oblast was exceeded in 11 monotowns: Kamensk-Uralsky (1.84%), Karpinsk (2.83%), Volchansk (2.9%), Kachkanar (2.13%), Verkhny Tagil (2.83%), Krasnotur'insk (2.47%), (2.45%), Verkhnyaya Tura (2.25%), Nizhniye Sergi (2.76%), Severouralsk (3.34%), Serov (1.74%).

The registered unemployment rate is below the oblast average level in Asbest (1.11%), Verkhnyaya Salda (0.79%), Nizhny Tagil (0.66%) and Polevskoy (0.69%).

As *I.O. Moskalenko* notes, the issue of the restructuring and development of monotowns, the economy of which fully depends on one or two rather prosperous, problem or absolutely noncompetitive in new market conditions enterprises, is rather acute in social, economic, political terms. Power-holding structures, enterprises and the residents of the majority of monotowns are unable to offset the increasing risks of dynamic external economic environment, excluding the possibility of sustainable city development [3].

Development institutions become the sources providing crucial support to one-company towns in Russia and abroad.

*The Ministry of Economic Development of the Russian Federation* considers **development institutions** as one of the state policy instruments stimulating innovation processes and infrastructure development with the use of public-private partnership mechanisms. The main objective of the development institutions is to overcome the so-called "market failures" in order to solve the tasks that cannot be accomplished in the optimum through market mechanisms for sustainable economic growth and the diversification of the economy [4].

In foreign countries the development institutions are financially supported by the whole complex of state and municipal socially oriented measures, among which, as an example, are the following:

– *professional retraining of the population* – frequently in one-company towns for this purpose new universities are established, the list of specialties is expanded and the educational and scientific potential of the population increases on the whole;

– *social support of the population* – the introduction of long-term paid leaves, benefits (for example, preferential mortgage loans); assistance in creating new jobs for redundant employees; organization of made work; entitlement to early retirement, etc;

– *support to small business development* at the expense of state funds, local budgets and public funds;

– *assistance to population resettlement* from unviable one-company towns (resettlement as the monotown support tool is most widely used in the USA due to high mobility of the population);

– *timprovement of old and the creation of new infrastructure* (the development of logistics, communications, the construction and reconstruction of residential quarters, etc.). Such special programmes exist in a number of countries. For example, the Ministry of Housing and Construction of France developed the programme "Assistance to housing construction", according to which the construction of new and the reconstruction of old residential buildings located in the central areas of towns is made out of the funds allocated by the state. Such support is effective, first of all, in attracting more trained labour force, and, secondly, in the situations, when the employees of a shutdown enterprise have the opportunity to work in a nearby town due to the developed transport infrastructure [5].

This institution building experience is being introduced in Russia as well.

Let us consider the results obtained by development institutions with regard to the state support provided to monotowns of the Sverdlovsk Oblast (according to the data of the local authorities of monotowns of the Sverdlovsk Oblast):

1. 164.68 million rubles were allocated from the federal budget for implementing measures to support the labour market of non-diversified territories in 2011.

In particular, 54.6 million rubles was attracted for the organization of made work for 5159 residents of monotowns, with the reimbursement of wages of the activity's participants to employers.

2. 13 one-company towns of the Sverdlovsk Oblast participated in regional targeted programmes "Overhaul of apartment buildings on the territory of the Sverdlovsk Oblast" and "Relocation of citizens from unfit housing facilities", implemented during the 2009–2012 period with the attraction of financial resources of SC "Support Fund for the Reform of the Housing and Utilities Sector".

Total amount of budget funds allocated for these purposes in the given period, exceeded 5.7 billion rubles, including:

– overhaul of apartment buildings – 4.4 billion rubles.,

– relocation of citizens from unfit housing facilities – 1.3 billion rubles.

In total, 1539 apartment buildings with a total area of more than 4.4 million square meters were overhauled, as a result of which more than 223.5 thousands of people improved their living conditions. The largest volume of apartment buildings were overhauled for the 2009–2012 period in Nizhny Tagil – 597 houses (2.3 million square meters), Kamensk-Uralsky – 522 houses (1.54 million square meters), Asbest – 46 houses (153.5 thousand square meters).

2 685 people were relocated from unfit housing in one-company towns. Total rehousing area exceeded 40.8 thousand square meters (the apartment buildings in disrepair or dangerous ones were demolished – 161 units). The largest volume of work on the resettlement of citizens from unfit housing facilities was carried out in Nizhny Tagil (1538 residents, 77 houses, rehousing area – 24.4 thousand square meters); Serov (571 residents, 50 houses, 7.7 thousand square meters); Karpinsk (306 residents, 20 houses, 4.4 thousand square meters).

Over 2 thousand jobs were created or saved as a result of such volume of work.

3. In order to implement measures to support small and medium enterprises in the Sverdlovsk Oblast over 187 million rubles were allocated from the regional budget to 15 non-diversified municipalities in 2010–2012, out of the budgets of different levels – more than

668 million rubles. The support programmes for the development of small and medium enterprises in one-company towns continue to be implemented. The recipients of support in non-diversified territories (Nizhny Tagil, Asbest, Kamensk-Uralsky) were 5199 small and medium enterprises in 2010, 2320 – in 2011, more than 500 small and medium enterprises in 2012, making it possible to save over 700 jobs in 2012 alone.

4. Due to the provided state support in these towns, the following activities have been carried out as well:

– the construction of 13.2 kilometers of highways, including 8.8 km in Asbest (789 million rubles of the government credits) and 4.4 km in Nizhny Tagil (246 million rubles of the government credits), more than 899 temporary jobs were created for the construction period;

– the reconstruction of biological treatment plants with the capacity of 15 thousand cubic meters in Nizhny Tagil (281.1 million rubles of the federal budget subsidies), which currently allowed providing with water up to 122.2 thousand residents of Dzerzhinsky District and 2 industrial enterprises – OJSC Uralvagonzavod and OAO Uralchimplast, facilitating the work on the creation of a chemical cluster on the basis of OAO Uralchimplast. Over the past three years the total volume of private investments attracted by the enterprise exceeded 740 million rubles (the production of novolac resins was organized, coal-injection plant was installed, as well as other projects were implemented);

– the construction of traffic interchange in Kamensk-Uralsky (426 million rubles of the government credits) and the reconstruction of 5.9 km of street and road network at the approach to the pipe cluster that is being formed on the basis of OJSC Sinarsky Pipe Works;

– end of the heating plant reconstruction (665 million rubles of the federal budget subsidies), providing reliable heat supply system to 50% of Kamensk-Uralsky residents. During the same period, the enterprise mastered the production of long pipes, formed a joint venture with the state-owned company Rosnano; total volume of private investments exceeded 1.6 billion rubles.

On the whole, the dynamics in overcoming structural constraints, imposed on the economy of the municipality by "non-diversification" precisely in one-company towns that had received state support, is positive:

– the share of the average number of employees at town-forming enterprises in the working-age population group of the municipality has decreased over the 2010–2012 period: from 14% to 13.2% in Kamensk-Uralsky , from 18% to 16% in Asbest;

– in Asbest, the share of town-forming enterprises in the townwide volume of own-produced shipped goods, executed works and rendered services decreased from 72% to 63% respectively.

– the share of profitable companies increased in Kamensk-Uralsky from 65% to 88%, in Nizhny Tagil – from 50.9% to 70.2%.

At present, the scientists strengthen focus on the process of institutional city design.

In particular, V.L. Tambovtsev proposed the following logic of the institutional design process:

– awareness of the problematic situation, i.e. formulation of the problem;

– target setting;

– determination of constraints on the set of possible means to achieve the objective;

– development, analysis and assessment of ways to reach the goal;

– setting of decision-making objective;

– decision-making, i.e. best option choice;

– elaboration and formalization of the option [6].

The author considers the formation of scientific approaches to the design of the institutional development of non-diversified territories urgent and necessary.

The *figure* presents the **map-making scheme of the institutional development of the non-diversified territory**, including the identification of problems/failures of monotowns, consolidation of available sources/opportunities for the development of monotowns, formation of strategic policy documents aimed at the institutional development of a one-company town.

The accuracy of **budget determination, the correct choice of development institutions of a one-company town** becomes important.

*R.M. Nureyev, Yu.V. Latov* presented the following formulation of the concept: *institutional choice* is such a change of both the formal and informal rules as well as the ways and effectiveness of forcible enforcement of rules and constraints, when one preferable option is chosen out of potentially possible variants.

The "institutional choice" concept practically merges with the concept of institutional innovation. After all, there is hardly at least one socio-economic problem that can be solved uniquely. Therefore, the introduction of new "rules of the game" always requires the preselection with regard to what exactly will be implemented out of the "menu" of new institutions [7].

*The public choice theory* indicates that all the actions undertaken by the state in the economy, are related to choosing one of the available alternatives. The most important is *the choice of the budget*. All sources of income are interchangeable. At the same time, all expense items compete with each other, as the increase under one item implies the decrease under another. Thus, it is necessary to decide where to take money from and what to spend it on [8].

It is important to precisely choose the **directions for monotown development**.

*Ye.G. Animitsa, N.V.Sbrodova, A.S. Zvorigin* highlight the following main directions of the monotown economic restructuring:

1. Small business development that turns into new centres of business activity and that has much greater development potential in the modern Russian conditions.
2. Arrangement of conditions for implementing active agricultural activity in one-company towns, which are located in favourable natural and climatic conditions.
3. Development of commuter trips of monotown residents to the nearby cities and the biggest cities.
4. Availability of temporary public works for the period until new jobs are created.
5. Use of economic opportunities with regard to labour markets and housing by the monotown population and relocation to another locality (motivated by market incentives), i.e. population shift.
6. Development of recreation and tourism areas in the monotown, with the active participation of small business.
7. Revival of Ural folk crafts in the monotown.
8. Other areas of monotown diversification, determined by their specialization and location [9].

The local authorities highlight the following priority directions of economic sectors development in the integrated investment plans of one-company towns of the Sverdlovsk Oblast.

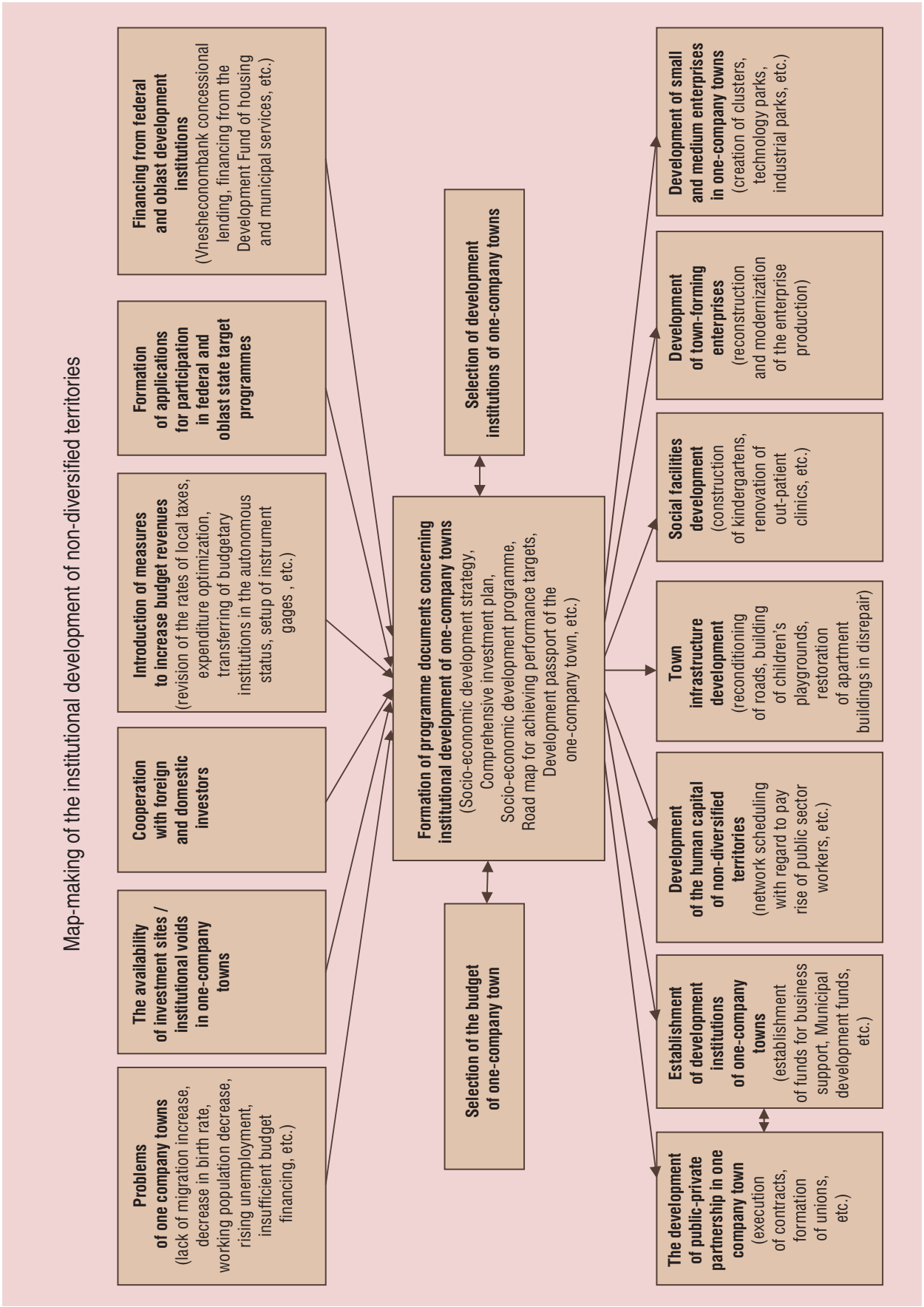
***Priority development directions of the industry:***

– innovation renovation of traditional industrial sectors (metallurgy, chemical industry and timber complex) in order to seal and expand the competitive advantages of towns and to form the basis for the modernization of industrial complex and economy as a whole;

– development of productions that are significant for sustainable economic development of the urban district;

– creation of new productions, permitting to change the structure of the industrial complex of the urban district;

– multiple rise in labor productivity;


Map-making of the institutional development of non-diversified territories
Problems of one company towns (lack of migration increase, decrease in birth rate, working population decrease, rising unemployment, insufficient budget financing, etc.)
The availability of investment sites / institutional voids in one-company towns
Cooperation with foreign and domestic investors
Introduction of measures to increase budget revenues (revision of the rates of local taxes, expenditure optimization, transferring of budgetary institutions in the autonomous status, setup of instrument gages , etc.)
Formation of applications for participation in federal and oblast state target programmes
Financing from federal and oblast development institutions (Vnesheconombank concessional lending, financing from the Development Fund of housing and municipal services, etc.)
Selection of the budget of one-company town
Formation of programme documents concerning institutional development of one-company towns (Socio-economic development strategy, Comprehensive investment plan, Socio-economic development programme, Road map for achieving performance targets, Development passport of the one-company town, etc.)
Selection of development institutions of one-company towns
The development of public-private partnership in one company town (execution of contracts, formation of unions, etc.)
Establishment of development institutions of one-company towns (establishment of funds for business support, Municipal development funds, etc.)
Development of the human capital of non-diversified territories (network scheduling with regard to pay rise of public sector workers, etc.)
Town infrastructure development (reconditioning of roads, building of children's playgrounds, restoration of apartment buildings in disrepair)
Social facilities development (construction of kindergartens, renovation of out-patient clinics, etc.)
Development of town-forming enterprises (reconstruction and modernization of the enterprise production)
Development of small and medium enterprises in one-company towns (creation of clusters, technology parks, industrial parks, etc.)

– greening of industrial production, introduction of environmentally appropriate (non-waste) technologies, use of modern high-performance water purification and air cleaning systems, materials recycling.

***Priority development directions of urban transport infrastructure:***

– trunk road network upgrading;

– improvement of pavement quality using innovation technologies in the

– process of highway maintenance;

– provision of parking lots to citizens;

– use of railway infrastructure;

– traffic safety provision.

***Priority development directions of agriculture and processing industry:***

– strengthening of material and technical base of agricultural producers;

– efficiency improvement of natural resources utilization, as well as the quality and competitiveness of products;

– improvement of financial sustainability of agricultural organizations;

– increase in the assignment level of production assets;

– introduction of new raw materials processing technologies;

– marketing development.

***Priority development directions of the trade and public catering sector:***

– formation of a favourable environment for investing private capital in the establishment of large (medium) retail and entertainment complexes, supermarkets in different areas of the urban district;

– compliance with modern requirements of the existing network of retail trade and public catering enterprises [10].

Thus, at present the issue concerning the institutional design of one-company towns, including advanced analysis of the voids, available and optional possibilities, the choice of the ways to spend budgetary and non-budgetary funds, selection and formation of the development institutions of non-diversified territories, becomes important and urgent.

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# Regional innovation system construction and deepening reformation

*The article considers the stages of formation of innovation systems in China's regions. It presents the current condition of these systems and the specifics of their present and future development. The topical issues concerning the improvement of innovation development management at the regional level are highlighted.*

*Regional innovation systems, innovation potential of China's regions, its management, balanced development.*

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Like the generation of a regional innovation system theory, the generation of a regional innovation system is also a process of evolution and accumulation. Although, China's regional innovation system research sprang up from 1990s, the practical exploration started from the China's reform of opening in 1978. China's regional innovation system is developing with the deepening of reform, in other words, market economy system reform is the motive power of regional innovation system. Hence, the development of China's regional innovation system is an achievement from the 30-year unceasing exploration, reformation, innovation, practice and improvement.

**1. The evolution and feature of China's regional innovation system** ***(figure)*****.**

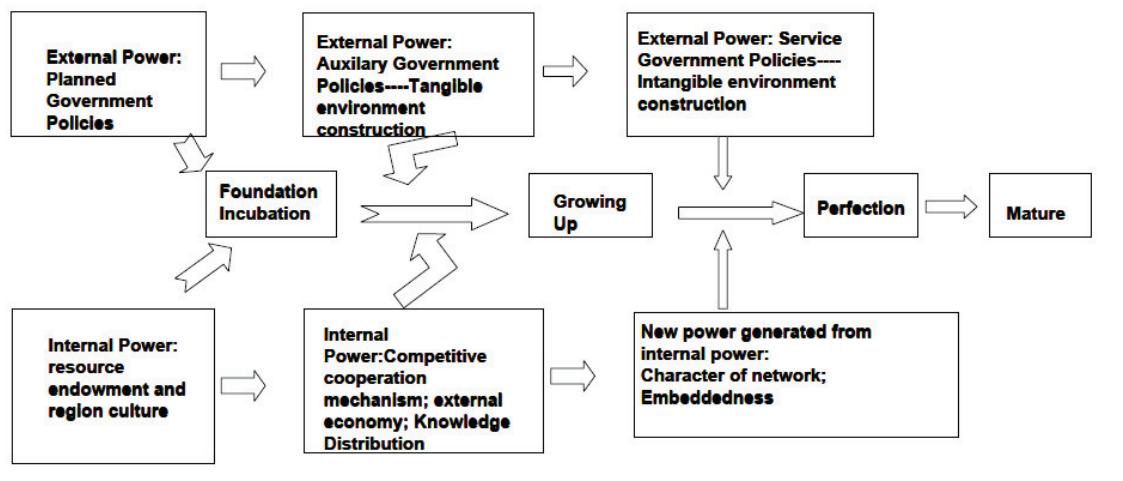
*Feature 1: Gradual model of regional innovation system development.*

As is well known, China's reforms are carried out gradually, that is, China carries on transformation from planned economy to market economy, from seclusion to openness, advancing orderly with multi-stage and steps. Therefore, China's regional innovation system construction process also shows the feature of advancing gradually and can be divided into the following phases: [1]

**I. 1978–1984: the foundation incubation process of regional innovation system.**

Marked by the convening of the Third Plenary Session of the 11th Central Committee of the Chinese Communist Party in 1978, China started its process in advancing reform and

Evolution power of every process in China's regional innovation system




opening up. Under the changes of macro-environment, some eastern regions started their practical explore in market-oriented reform. For instance, some small-scale and professional family workshops and small businesses sprang up rapidly in Zhejiang province. These businesses gathered together to survive and develop in the market and enhance technology by purchasing new equipments and imitating technological flows, which contributes to the rudiment of regional innovation system.

**II. 1985–1995: the growth process of regional innovation system.**

With the continuous deepening of economic system reform and gradual establishment of market economy system, the external power and internal impetus of regional innovation system have transmitted from government independent promotion to common promotion of multiple market subjects gradually. Government function had conversion from direct participation to indirect participation. In that stage, 84 national new high-tech industrial development zones have been established in nation-wide, industrial cluster has become the concentrated reflection of the regional innovation system. The regional innovation system started a virtuous circle of self-reinforcement and accomplished the evolution toward growth phase.

**III. Since 1996: the perfection process of regional innovation system.**

Market economy and mechanism are gradually developing and perfecting. Service function of government has been consolidated. Market atmosphere of competitiveness and cooperation has been strengthened. Enterprises are paying more attention to collaboration and division of labor. Wider and more extensive cooperation will happen in industry-university-research cooperation. Capability of self-independent innovation of enterprises has been facilitated which accelerating the perfection and completion of regional innovation system.

*Feature 2: Imbalance in regional innovation system construction.*

Since the reform and opening up, China is still focusing on plans to give priority on development to regions and fields, which is an unbalanced innovation development view. Hence, different regions and fields differentiated in development policy and resource endowment, resulting in the non-balance in regional innovation system construction.

**Regional distribution imbalance of innovation resource**

According to the relevant data, the indexes of scientific and technological activities, number of personnel, science and technology collection amount, patent application authorization number, oversea article research, technology market turnover and so forth are decreasing from East to West China, establishing an obvious pattern of three grades (East, Centre, West in region). Specifically, the Eastern region occupies 60%, the Centre occupies 20% while the West takes up 10%. In addition, Beijing and Shanghai and other international metropolises all locate in eastern China, highly concentrated in scientific resource and highly developed in science, which has become the "First World" in China's scientific resource and development.

**(1) Unbalanced innovation capacity**

Lack of balance in scientific resource distribution has determined the unbalance in regional scientific innovation capacity to a large extent, which will be transmitted to scientific and social development field and make an extreme non-balance in regional economic development capacity.

With the perfection in economy market and mechanism, several regional "Innovation Poles" have established in China. Innovation system of city circles based on Pearl River Delta (Guangdong), Yangtze River Delta (Shanghai, Jiangsu and Zhejiang) and the Bohai rim (Beijing, Tianjin, Liaoning and Shandong) began to take shape and has become the "Innovation Highland" with stronger innovation capacity in China. Comparatively speaking, regional innovation system construction of middle and western China are developing in a slow pace.

*Feature 3: Difference in regional innovation system structure.*

Because Chinese reform is carrying out from rural to urban areas, from coastal area, riverside, border area to inland, from east to west gradually with regions differ in pace, pattern, degree of opening in reform and transformation, which lead to the differentiation in regional innovation system structure and present in several typical modes: Beijing Zhongguancun science park mode, Shanghai Zhangjiang Hi-Tech Park mode, Guangdong Shenzhen mode, etc.

Innovation capacity ranking change and index adjustment influence of all regions in 2012

| Region | Rank of 2012 | Rank of 2011 | Variation | Region | Rank of 2012 | Rank of 2011 | Variation |
|---|---|---|---|---|---|---|---|
| Jiangsu | 1 | 1 | 0 | Inner Mongolia | 17 | 21 | 4 |
| Guangdong | 2 | 2 | 0 | Henan | 18 | 17 | -1 |
| Beijing | 3 | 3 | 0 | Heilongjiang | 19 | 20 | 1 |
| Shanghai | 4 | 4 | 0 | Jiangxi | 20 | 18 | -2 |
| Zhejiang | 5 | 5 | 0 | Hainan | 21 | 27 | 6 |
| Shangdong | 6 | 6 | 0 | Guangxi | 22 | 22 | 0 |
| Tianjin | 7 | 7 | 0 | Guizhou | 23 | 24 | 1 |
| Liaoning | 8 | 8 | 0 | Jilin | 24 | 16 | -8 |
| Anhui | 9 | 15 | 6 | Shanxi | 25 | 23 | -2 |
| Hunan | 10 | 11 | 1 | Sinkiang | 26 | 28 | 2 |
| Hubei | 11 | 13 | 2 | Gansu | 27 | 25 | -2 |
| Sichuan | 12 | 9 | -2 | Yunnan | 28 | 26 | -2 |
| Chongqing | 13 | 10 | -3 | Qinghai | 29 | 30 | 1 |
| Shanxi | 14 | 12 | -2 | Tibet | 30 | 31 | 1 |
| Hebei | 15 | 19 | 4 | Ningxia | 31 | 29 | -2 |
| Fujian | 16 | 14 | -2 | | | | |

Note: In the ranking changes, positive number refers the ranking is going up while negative number refers the ranking is going down.

**(1) Beijing Zhongguancun science park mode**

Beijing's regional innovation system is government-dominated and the government has become the subject of scientific research and development. The knowledge creative ability of Beijing has surged ahead of other regions and embodied its feature of rich resource in scientific education. For instance, Zhongguancun has "knowledge base" advantage by possessing Peking University, Tsinghua University and Chinese Academy of Sciences.

**(2) Shenzhen regional innovation system is market-dominated**

It is strong in scientific transform and application of scientific and technological achievements and formed a self-innovation system with enterprise as subject. Regional innovation principally relies on "External Introduction". Shenzhen has a good financing condition, a loose policy environment, advanced commercial awareness and thorough market mechanism, as well as the geographical location of adjoining to Hong Kong.

**(3) Shanghai regional innovation system is both market and government-dominated**

Shanghai takes its leading position in regional innovation capacity by virtue of outstanding commercial atmosphere, profound industrial foundation, innovation dominant role of enterprises as well as resource agglomeration capacity of Yangtze River Delta, and by its openness and internationalization.

In addition, Jiangsu and Tianjin's regional innovation system are also dominated by both market and government. They are up-rising stars in construction but with strong momentum in development. The creative capacity and environment of Jiangsu both rank first in China. On the one hand, it benefits from imperfection of market economy system.

On the other hand, it reflects that the favorable creative environment arouses the vigour of enterprise innovation [3].

**2. Experience and issues of China's regional innovation system**

We can get the following main experience from analyzing the evolution and feature of regional innovation system

**(1) Economic system transformation and reform is the institutional prerequisite of regional innovation system.** The key factor affecting regional innovation system construction lies in if there is a system and mechanism to arouse the passion to innovate. Along with the perfection of market economy system, regional innovation system is gradually improving. Hence, to achieve the reform goals including establishing a vigorous and forceful macroeconomic regulation and control system, setting up a market system with unity and openness, equal competition and sound rules, building mechanism of enterprise to adapt market economy request, facilitating pattern of ownership that diversified economy can coexist and enjoy joint development, installing and perfecting the social security system, etc, is the institutional prerequisite for the government to advance regional innovation and realize economic development.

**(2) The government plays a decisive role in regional innovation system construction.** In consideration of China, it is in a special period that both economy market and market system are defective. Governments at all levels are undertaking tough tasks of system innovation and are playing roles in system designing, resource mobilization, facilitating changes, benefit coordination and so forth. Hence, the construction and perfection of regional innovation system requires more from the government to act as a driving force and work better in coordination as well as provide better service in resource integration, coordination innovation subjects [4].

**(3) There is a direct proportionality between the development degree of regional innovation system and the strength of enterprise independent**

**innovation capability in intra-region.** With the perfection of function and operation mechanism in regional innovation system, it becomes more obvious in its promotion for the independent innovation capability of intra-region enterprises.

However, we can see a prominent problem from this:

A. Regional innovation system lacks top-level design. At present, most provinces and regions of China cultivate and construct regional innovation system respectively in accordance with its foundation and need. However, the state has less participation in regional innovation system cultivation and construction of provinces and regions, and plays insufficient role in nation-wide and general coordination and planning for functional orientation of them. This certainly will lead to the non-balance in innovation resource allocation between regions, structure duplication between different regional innovation systems, non-clearance in division of labor as well as slow in development by lacking of pertinent policy support.

B. Deviation exists in government functional orientation. During the process of building regional innovation system, government sometimes is used to direct and control in accordance with thinking and manner of the "plan". In the regional innovation system, the government works more but more participation is needed in macro-control, policy guidance and service function.

C. The enterprise status as technology innovation subject is ambiguous. Most enterprises are inactive in research and development, insufficient in innovation investment and imperfect in innovation organization mechanism, which impedes the formation and enhancement of enterprise self-independent innovation capacity.

D. Strong coordination mechanism and stable and long-acting cooperation in production, study and research mechanism is of deficiency. Phenomena include barriers between higher and lower levels or between different departments and regions of scientific resources, segregation and repetition, mutual disconnection between science and economy still exist. Those will constraint the technological innovation and positivity of technological personnel in innovation and entrepreneurship, also, will affect the industrialization scientific and technological fruits [4].

**3. Deepening reformation, constructing a balanced regional innovation system**

From a general view, China's regional innovation system is imperfect. A regional innovation system which not only meets the requirement of socialist market economy, but is also in line with scientific and technological innovation regulation should be established by deepening the reform and improving market system and mechanism.

**(1) Building a collaborated development mechanism between national innovation system and regional innovation system**

To establish an innovative country requires a national innovation system (NIS) with rational construction and efficient operation. In addition, the foundation of NIS is to establish a regional innovation system (RIS) full of vigor. Hence, in order to advance division of labor and interaction of NIS and RIS, the mode of "Local as subject, support from the state" should be taken and 2 motivation from the central and local should be given a full play. National innovation system focuses on technology with perspectiveness, fundamentality and generality as well as strategic high-technology. RIS puts emphasis on technology, R&D, promotion and application based on the actual demand of the region as well as establishes specialty industry relying on resource advantage of the region [5].

**(2) Pushing forward the balanced development of regional innovation system**

Establishing and perfecting market mechanism compatible with scientific and technological innovation activities, fully taking use of market mechanism to strengthen the competitiveness and cooperation between enterprises and industries, establishing mutually-beneficial and win-win cooperation in cross-administrative regions and facilitating accessible flow of innovation resource factors; Building regional innovation system crossing administrative districts, enhancing the regional innovation capacity, and then boosting the harmonious development of region economy.

**(3) Transferring the function of government and building innovation development environment**

Services for enterprises' innovation should be provided in aspects including regional research and development institution construction, regional infrastructure, technology innovation, talent training, enterprise financing, absorbing multinational corporation research center and other aspects. A sound environment and regulation should be provided for enterprise innovation in fiscal and taxation policies, intellectual property protection, system innovation and other aspects. A market environm ent with free and fair competition for enterpri ses should be built by maintaining the market order, eliminating the function of policy barrier for entering or retreating from an industry.

**(4) Building the system and mechanism of enterprise-oriented industrial technology research and innovation**

Further strengthening and improving politic measures; completing the incentive mechanism in inner-enterprise innovation and training mechanism of innovation talents; accelerating technological innovation system with enterprise as mainstay, market as orientation as well as close combination of production, study and research; facilitating enterprises to play role in organizing industrial technology R&D, implementing R&D innovation, investing in R&D, constructing innovation platform, integrating innovation talents, application of achievement transformation and owing intellectual property [6].

**(5) Building financial system with innovative services and expanding innovative financing channels**

It is encouraged to develop venture investment, enhance equity transaction of all sorts of technologies and construct multi-level capital market to facilitate small-and-medium sized banks to provide innovative financing services for small-and-medium-sized enterprises and providing financial support in multiple aspects for regional innovation.

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# Eco-economic evaluation of emission treatment technologies efficiency at thermal power stations

*The article substantiates the necessity of introducing the best available emission treatment technologies at thermal power plants. It studies in detail the available technologies of removing sulphur dioxide from thermal power stations' emissions. The article proposes a methodology for evaluating eco-economic efficiency of using the best available technology on the example of sulphur dioxide emissions treatment by thermal power stations.*

*Eco-economic evaluation of emission treatment technologies efficiency at thermal power stations, the best available technologies.*

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Thermal power stations (TPS) and steam electric stations (SES) are among the major pollutants in Russia and abroad, because, in addition to the main combustion products, carbon and hydrogen, which are non-toxic, they emit sulphur dioxides ($SO_2$) into the atmosphere.

Modern TPS and SES with the capacity of 2.4 million kW emit about 50 tons of $SO_2$ per day. Scientists estimated that TPS and SES emit 46% of the total amount of sulphur dioxide and 25% of coal dust discharged into the atmosphere by industrial enterprises [1].

Sulphur dioxide is a colourless, non-flammable gas, which causes irritant toxic effects. $SO_2$ emissions cause great damage to flora and fauna. This gas destroys chlorophyll in plants, damages their leaves and needles. It is toxic for man and animals as well. Sulphur dioxide, entering their organism, combines with hemoglobin in the blood, which results in a lack of oxygen leading to various nervous system disorders. In addition, $SO_2$ can cause fatal allergic reactions in people suffering from asthma.

Sulphur dioxide spreads very well over wide areas and, naturally, there is a proportional decrease in its concentration when moving away from the source of pollution. In addition, once in the atmosphere, it transforms into a sulphurous anhydride, which is also a polluting and toxic gas.

Thus, reducing the amount of sulphur dioxide in gas emissions from TPS and SES has become an urgent task when introducing the best heat and power production technologies available.

The best available technology is a set of goods (products), performed works, rendered services at the facilities, affecting the environment, technological processes, equipment, methods, techniques and tools that are based on modern scientific and technological achievements combining to the greatest advantage the indicators of achieving environmental objectives and economic viability subject to the technical possibility of their application.

Currently, the following technologies are used for reducing sulphur oxides emissions from power plants, burning sulphur-containing fuel:

1) preliminary (pre-combustion) reduction of sulphur concentration in the original fuel;

2) removal of sulphur oxides from flue gases using special facilities;

3) the use of refuse-derived fuel as an alternative.

Desulphurization (removal of sulphur from the original fuel) is a promising method of reducing emissions from heat-and-power engineering enterprises, since it most comprehensively solves the task of eliminating the negative effects associated with the formation and movement of sulphur oxides in the boiler circuit. At the same time, there is no need to dispose of desulphurization products, which increases the combustion efficiency of such fuel. However, this process is technically sophisticated, and the introduction of such technology is costly [2].

The second method, consisting in removal of sulphur using sulphur capture installations, is more widespread.

At present there are more than 80 ways of removing $SO_2$ from flue gases. All of them can be divided into wet types and dry types, depending on the phase, in which the process of linking sulphur dioxide takes place.

Wet methods of flue gas desulphurization are used more widely owing to their greater economic and environmental efficiency. They use cheap consumables, such as lime, limestone and water. As a result, a marketable product (gypsum) is obtained. In addition, the use of these methods significantly reduces sulphur oxide emission, as well as expenditures connected with the introduction of this technology.

But at the same time, the available technologies have a number of drawbacks, such as the presence of wastewater requiring treatment, cumbersome equipment, the necessity of creating liquid irrigation systems, the presence of waste, high power consumption by technological processes [1].

The third option of reducing sulphur dioxide emission is the use of refuse-derived fuels (RDF). Refuse-derived fuel is obtained by the processing of waste, when non-combustible materials are removed and combustible components are retained and used for generating energy.

The USA and the UK have been processing waste into fuel pellets 'Refuse Full' since the 1970s. This fuel can be stored for a long time and transported over relatively large distances, and its environmental impact is significantly lower.

The advantage of using refuse-derived fuel, regarding its qualitative characteristics, consists in its high calorific value and low content of ash and carbon. Besides, it reduces the amount of unusable waste and its concentration in the environment.

The disadvantages of using refuse-derived fuel are caused by heterogeneous composition of waste, by the difficulties of complying with the requirements related to the burning of waste in different countries, by the necessity of a more comprehensive monitoring of combustion process and also by the necessity of re-equipment. The technology of deriving secondary fuel from waste is understudied; besides, its implementation in Russia would require significant investments [2].

The analysis, aimed at performing eco-economic evaluation of emission treatment technologies efficiency at thermal power stations, was carried out using the expert assessment method.

From all the available desulphurization technologies we can distinguish three most common ones and evaluate them according to three groups of indicators – environmental, economic and social. We can highlight several most important factors in each group [3].

The results of choosing the most efficient (best) available technology on the basis of the expert assessment method are presented in *table 1*.

The available technologies are marked as follows:

- technology 1 – preliminary desulphurization;
- technology 2 – absorption of $SO_2$ by using alkaline-earth compounds (60-fold reduction of $SO_2$);
- technology 3 – transition to the use of refuse-derived fuel.

Expert assessment was performed on a 5-point scale. The score of 1 point reflects the greatest environmental impact and the highest costs, the score of 5 points – the minimum impact and minimum costs, respectively. The rest of the scores (2, 3, 4 points) are intermediate. The following coefficients by the groups of indicators were introduced for

Table 1. Choosing the best available technology to reduce sulphur oxide emissions

| Criterion | Technology 1 | Technology 2 | Technology 3 |
|---|---|---|---|
| *1. Ecological indicators (0.25)* | | | |
| 1.1. Impact on atmospheric air | 3 | 4 | 3 |
| 1.2. Impact on water bodies | 4 | 2 | 5 |
| 1.3. Impact on soil | 3 | 3 | 4 |
| 1.4. Resource-saving | 4 | 3 | 5 |
| 1.5. Use of waste as products | 0 | 5 | 5 |
| Sum | 3.5 | 3.5 | 5.5 |
| *2. Economic indicators (0.5)* | | | |
| 2.1. Capital expenditure | 1 | 3 | 2 |
| 2.2. Operating costs | 2 | 3 | 1 |
| 2.3. Demand for the secondary product | 0 | 5 | 3 |
| Sum | 1.5 | 5.5 | 3 |
| *3. Technological and social indicators (0.25)* | | | |
| 3.1. Personnel safety | 4 | 3 | 5 |
| 3.2. Complexity of technological process | 3 | 4 | 2 |
| Sum | 1.75 | 1.75 | 1.75 |
| Total | 6.75 | 10.75 | 10.25 |

objective evaluation: 0.25 for ecological and technological indicators, 0.5 for economic indicators, because, currently, this criterion is fundamental.

When conducting the environmental expert assessment of the available technologies, we also took into account the related possible emissions (discharges) of pollutants into the air (crit. 1 in tab. 1).

Desulphurization technologies and the use of refuse-derived fuel will have a negative impact on the atmospheric air (3 points), and the technology of sulphur dioxide absorption using alkaline-earth compounds is almost completely eco-friendly (4 points).

However, this technology, as a method of wet purification, requires large amounts of wastewater (2 points).

The impact of each method on the soil cannot be characterized as critical (3, 4 points). However, when using alkaline-earth sorbents, the deposition that forms on the walls of the device should be removed and disposed of.

From the resource saving viewpoint, the technologies of desulphurization and transition to the use of RDF are the most advantageous due to minimal consumption of resources (5 and 4 points). The absorption technology requires limestone and large amount of water (3 points).

When applying the absorption technology, the waste becomes a product (gypsum, used in construction), and the use of RDF implies the use of waste as fuel.

The expert assessment of economic efficiency of the existing available technology (crit. 2 tab. 1) shows that the technology of reducing sulphur concentration in the fuel (desulphurization) is the most unprofitable economically, since the capital expenditure and operating costs of the equipment and its maintenance are very high (1, 2 points). Waste treatment for using it as fuel also implies high expenditures, primarily capital.

The expert assessment of the existing available technology by the technical parameters (crit. 3 tab. 1) shows that RDF-based technology is the safest for personnel (5 points), but it is understudied and it is not used widely, which means that certain technological difficulties may emerge in its implementation (2 points). The presence of wastewater, the need for permanent heating of gas and removing depositions from the walls of the device make the absorption process unsafe (3 points), but this is compensated by the continuity and relative simplicity of the technological process (4 points).

Thus, using the expert assessment method, it is possible to identify the most efficient technologies and choose the most affordable one among them, which would satisfy the criteria of both the economic and commercial efficiency of an innovation project.

Judging by the expert estimates, the technology of preliminary desulphurization of fuel proved to be the most inefficient one according to the total score. This is explained by the fact that its implementation requires significant one-time expenses on equipment that are not always consistent with the available financial resources.

The latest RDF technology is promising, but costly; and it is not implemented in Russia due to the inaccessibility and scarcity of information and R&D in this sphere.

The expert estimates have proved that the best available technology in terms of eco-economic efficiency is the use of alkaline-earth compounds for absorption of $SO_2$.

Along with a significant environmental effect, the application of the best available technology enables third-party organizations to obtain additional economic effect from the sales of gypsum used in the technological process.

The quantitative assessment of commercial effectiveness of an innovation environmental project on the implementation of the best

Table 2. Calculation of capital investments

| Fixed assets | Number, units | Cost of a unit, rubles | Total cost, rubles |
|---|---|---|---|
| Cost of absorption equipment, rubles | 5 | 900 000 | 4 500 000 |
| Cost of suspension-producing equipment, rubles | 3 | 80 000 | 240 000 |
| Cost of wastewater treatment equipment, rubles | 2 | 100 000 | 200 000 |
| Cost of treatment of absorber from depositions, rubles. | 1 | 20 000 | 20 000 |
| Total | | 4 780 000 | |

Table 3. Calculation of operating costs

| Expenses | Costs, rubles/year |
|---|---|
| For water | 87 600 |
| For electric power | 1 200 850 |
| For purchase of lime | 391 210 |
| For purchase of fuel | 735 000 |
| Removal of waste | 585 000 |
| Payroll, including deductions to the Compulsory Medical Insurance Fund and the Pension Fund of Russia | 1 220 000 |
| Total | 3 361 910 |

Table 4. Economic benefit calculation results

| Indicator | Unit of measurement | Value |
|---|---|---|
| Net present value (NPV) | Ruble | 1745 |
| Payback period ($P_{pb}$) | Year | 4.6 |
| Internal rate of return (IRR) | % | 6.3 |
| Profitability index (PI) | Unit | 1.37 |

existing available technology of $SO_2$ absorption using alkaline-earth compounds was carried out using the Guidelines on assessing the efficiency of investment projects, approved by the Resolution of the Russian Federation State Committee for Construction, Architectural and Housing Policy (Gosstroy) dated June 21, 1999. No. VK 477 [4].

The lump sum capital investments *(tab. 2)* and operating costs *(tab. 3)* have been calculated on the example of a thermal power enterprise located in Perm Krai [5]. The capacity of the absorption unit is 1200 $m^3$/hour.

The calculation of current operating costs reflects the continuity of technological process, its high energy intensity and low cost of raw materials (tab. 3) [5].

Having implemented this technology, the company annually obtains additional economic benefit due to the reduction of environmental damage. The value of prevented environmental damage, calculated using the 'Temporal environmental impact assessment metho-dology', is used as the annual profit [6]:

$$I_{prr} = I_{spr} \cdot (M_1 - M_2) \cdot K_e \cdot J_d = 52.2 \cdot$$

$$\cdot 51560 \cdot 1.7 \cdot 1.06 = 4850 \text{ thousand rubles.}$$

Our calculations on the basis of the 'Methodology guidelines on assessing the efficiency of investment projects' [4] defined the main indicators of evaluating economic efficiency of the best available technology among those under our review *(tab. 4)*.

Thus, we can conclude that, since NPV = 1745 > 0, and PI = 1.37 > 1, the project is worth to be considered.

The payback period of the innovation environmental project under our review is 4.6 years and the profitability index is 1.37, this means that the project is quite attractive for potential investors and creditors.

Besides, in terms of socio-economic efficiency, the project is relevant and useful for ensuring the country's environmental security.

Speedy introduction of the best available technologies into innovation environmental projects requires, in our opinion, the attraction of own funds of enterprises and targeted credits at concessionary interest rate, domestic and foreign banks, as well as non-governmental and municipal environmental funds.

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# Assessment of the performance of the region's agriculture

*The article presents the socio-economic characteristics of the activity of the region's agricultural enterprises by the results of the questionnaire survey of enterprises' managers conducted in 2013. The obtained information has been the basis for identifying problems in the functioning of the Vologda Oblast agriculture and proposes the ways to improve the current situation.*

*Agricultural production, labour potential, investment, innovation, World Trade Organization (WTO), management in agriculture, agrarian policy.*

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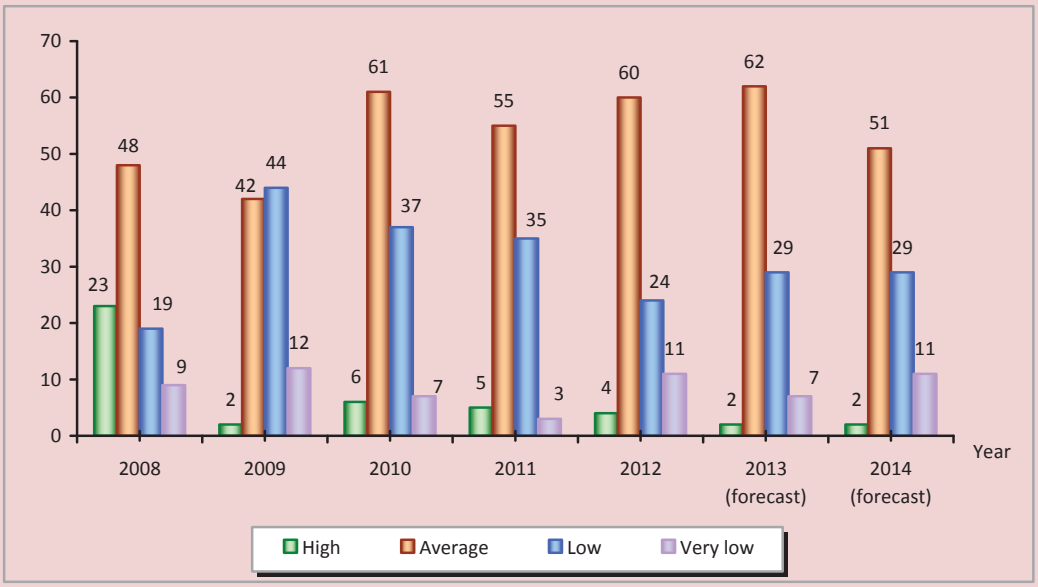
Slackening of attention to agricultural development issues in the first decade of market transformations in Russia led to significant social losses. Moreover, the implementation of federal and regional target programmes did not provide quality changes in the region's agriculture [2; 3; 5; 7].

Development of agriculture is still restrained by the number of consistent problems; in order to solve them it is necessary to carry out the monitoring of agricultural enterprises' activity for the purpose of studying the dynamics of their leaders' assessments concerning the state of labour potential, investment activity, cooperation with different institutions, readiness to modernization, and functioning in terms of open market.

Figure 1. The Vologda Oblast agricultural enterprises performance assessment by their heads (as a percentage of the number of respondents)




The questionnaire survey of agricultural enterprises' managers in the Vologda Oblast[1] conducted in 2013 revealed the main trends and problems in the agricultural sector. Besides, the survey's results confirm the statistics concerning the difficulties existing in the region's agriculture.

The survey results show that the majority of heads gave medium and low estimates (60 and 24% respectively) to their enterprises' performance in 2012. In comparison with last year's data[2] we observe the increase in positive estimates and the reduction of negative estimates *(fig. 1)*.

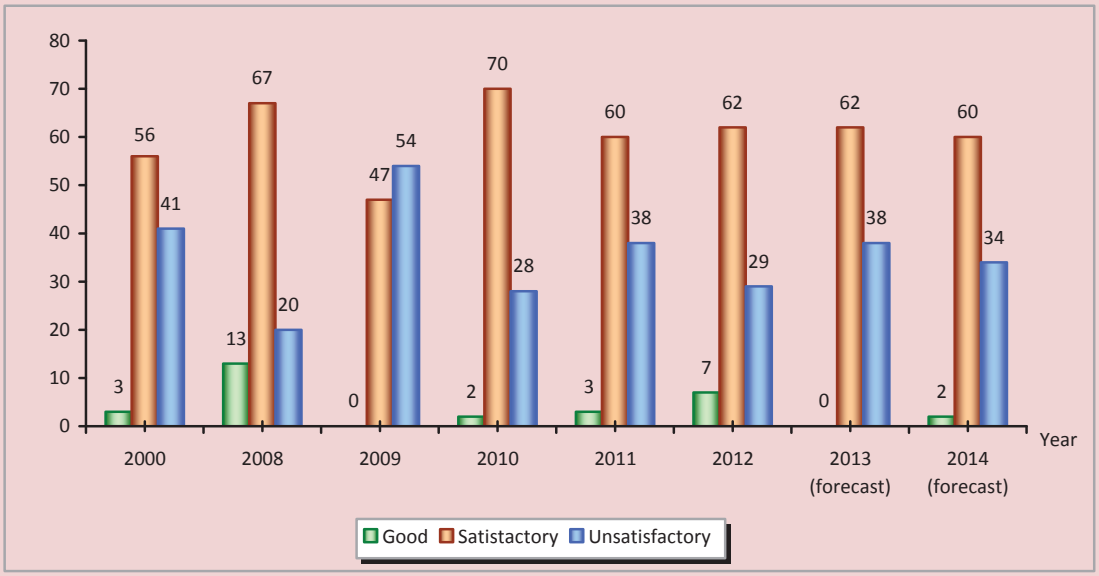
Moreover, the assessment of the agricultural enterprises' financial condition improved in 2012: in comparison with 2011 the share of leaders evaluating the state of enterprise as good has risen (from 3 to 7% respectively; *fig. 2*), along with the reduction in unsatisfactory assessments (from 38 to 29%). At that, in perspective, according to the leaders' opinions, the financial state of agricultural sector will stabilize, though bankruptcy threat will exist for 27% of enterprises in two coming years. Although more than half of respondents (55%; in 2011 – 48%) consider that the financial situation will allow agricultural enterprises to stay afloat in the future.

In addition, forecast estimates of business performance factors for 2013 are rather pessimistic: more than 80% of the leaders predict the increase in the prime cost of and prices for the products; more than one third suppose that the volume of capital investment will decrease or remain the same; according to 51% of leaders, the level of profitability at the end of 2013 will reduce; 51% of respondents claim that the indebtedness to banks will remain on the same level.

[1] The survey has been conducted by ISEDT RAS since 1992. The purpose of the survey is to assess the state of agriculture and to identify the directions for its improvement. The research tool is a questionnaire, which consists of questions with a scale of answers, open and closed questions. The questionnaire has been complied with the use of sectional approach (the questions on particular topics are represented in clusters. The questionnaires have been sent to the heads of large and medium agricultural organizations of various organizational-legal forms of ownership in March 2012, provided that the representativeness of the sampling was maintained in the districts of the oblast. 45 respondents from 26 municipal districts of the region took part in the survey.

[2] The question about evaluation of enterprise performance was firstly asked in 2009.

Figure 2. Assessment of financial condition of their enterprises by the heads of the Vologda Oblast agricultural organizations (as a percentage of the number of respondents)




In 2012 the enterprises' managers most often pointed out the aggravation of prices disparity with regard to produced agricultural products (93%) and lack of budget support to agricultural commodity producers (89%; *tab. 1*) among the factors preventing sustainable functioning of agricultural enterprises. Difficulties in productive activity of agrarians in 2012 were also caused by the high taxation level. Nevertheless, in comparison with 2011, the ratio of leaders lacking current assets decreased by 14 percentage points (in 2011 – 30%).

It is necessary to note that the above factors have been relevant for a few years already. At the same time, in comparison with 2011, the share of managers who consider great indebtedness and underdeveloped social infrastructure to be the primary factors affecting the activity of agricultural enterprises has increased by 23 percentage points (almost twice and by 9 percentage points, respectively).

In order to adapt to the adverse economic conditions, agricultural organizations' managers took active steps in 2012: more than one third of them carried out activities for enhancing labour discipline, 27% implemented innovation, resource-saving technologies. In comparison with 2011, the share of respondents, who consider it necessary to reduce the number of employees, has doubled. However, 18% of respondents have changed the structure of crops, 7% have changed the organizational structure, and 18% reduced the number of livestock *(tab. 2)*.

The share of managers, who consider it necessary to use new technologies, amounted to 27% in 2012, which is almost half lower that the level of 2011. There has been a 2-fold reduction in the number of respondents planning to improve the quality of products (in 2011 – 70%, in 2012 – 38%) and working conditions (in 2011 – 45%, in 2012 – 13%). However, we consider it positive that in the future the agricultural enterprises' managers intend to search for new sales markets – 40% (in 2012 – 27%), improve the quality of production – 42% (in 2012 – 38%), change the structure of crops – 29%, increase livestock population – 27%.

Table 1. Main factors preventing the development of agricultural enterprises in the Vologda Oblast (as a percentage of the number of respondents)

| Factor | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Aggravation of prices disparity with regard to produced agricultural products and industrial resources for the village | 90 | 96 | 95 | 90 | 93 |
| Lack of budget support to agricultural producers | 83 | 93 | 84 | 98 | 89 |
| Lack of personnel and a low level of their qualification | 38 | 41 | 65 | 48 | 38 |
| Lack of working assets | 54 | 61 | 44 | 30 | 16 |
| Poor condition of facilities and infrastructure | 50 | 46 | 44 | 38 | 38 |
| Low level of labour remuneration (wages) | 35 | 23 | 44 | 50 | 16 |
| High indebtedness and low paying capacity | 25 | 59 | 42 | 43 | 20 |
| Underdevelopment of social infrastructure in the settlement where your enterprise is functioning | 44 | 21 | 42 | 20 | 11 |
| High level of taxation | - | 21 | 42 | 45 | 40 |
| Absence of state control over the processors, intermediaries and trade organizations on the issues of pricing in agricultural production | 54 | 57 | 35 | 50 | 33 |
| Adverse environmental conditions | - | 0 | 33 | 15 | 16 |
| Introduction of new standards for technical regulation of agricultural production quality | - | 50 | 14 | 18 | 9 |

Table 2. Measures implemented by the heads of agricultural enterprises in the Vologda Oblast to adapt to the modern economic conditions (as a percentage of the number of respondents)

| Activities | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 (forecast) |
|---|---|---|---|---|---|---|
| Improvement of agricultural production quality | 28 | 66 | 51 | 70 | 38 | 42 |
| Search for new market outlets | 35 | 18 | 40 | 43 | 27 | 40 |
| Reduction in the number of livestock | 10 | 25 | 35 | 15 | 18 | 18 |
| Introduction of innovation, resource-saving technologies | 70 | 50 | 33 | 53 | 27 | 33 |
| Enhancement of labour discipline | 48 | 32 | 30 | 53 | 36 | 33 |
| Increase in the number of livestock | 41 | 21 | 30 | 38 | 25 | 27 |
| Improvement of labour conditions | 63 | 41 | 23 | 45 | 13 | 11 |
| Reduction in the number of personnel | 21 | 11 | 21 | 10 | 20 | 18 |
| Changes in the structure of crops | 21 | 9 | 14 | 23 | 18 | 29 |
| Establishment of new non-agricultural productions | 19 | 7 | 14 | 5 | 4 | 9 |
| Change of organizational structure | 2 | 7 | 12 | 15 | 7 | 9 |
| Introduction of market mechanisms of relations between the structural units of an organization | 7 | 0 | 5 | 3 | 2 | 4 |

The labour potential of agricultural organizations is characterized by the optimal number and qualification of the workforce. So, according to the managers, the provision of agricultural enterprises with staff was satisfactory (53%) in 2012, compared with 2011. At the same time, the share of managers of agricultural enterprises, which in 2012 felt the shortage of highly skilled workers of leading occupations, increased by 5 percentage points *(tab. 3)*.

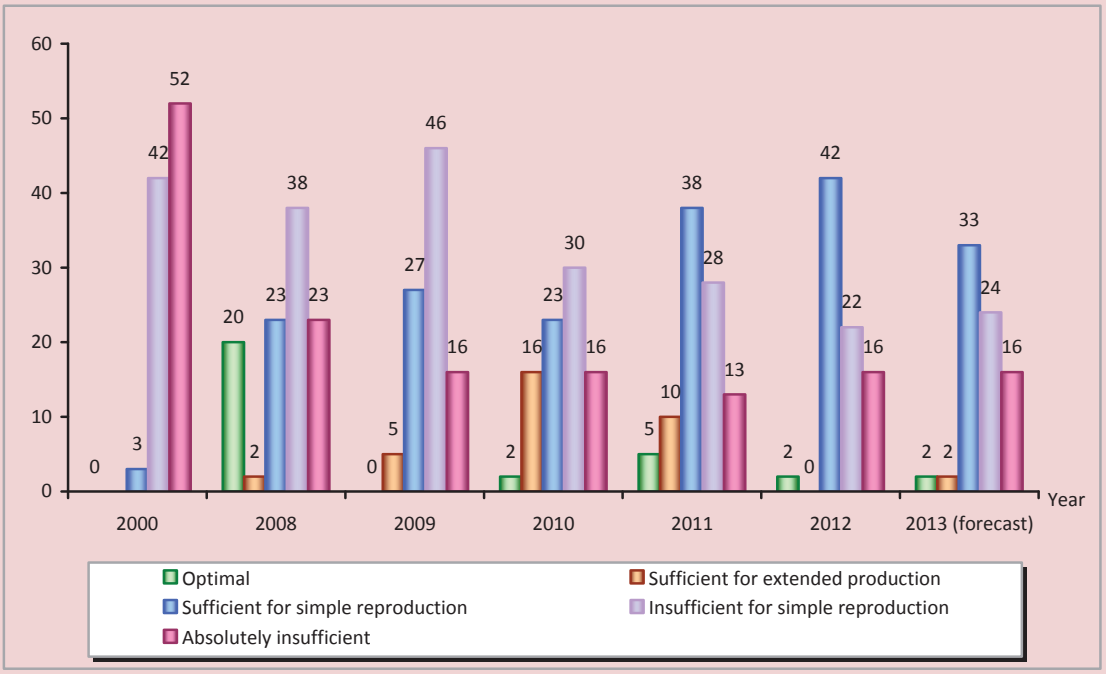
The provision of agricultural organizations with specialists and middle workers is estimated as satisfactory. In comparison with the results of a survey conducted in 2012, there has been an increase in the share of persons, who pointed out the necessity to recruit more specialists.

The survey shows that the problem concerning the lack of funds allocated by the majority of agricultural enterprises for investment purposes remains relevant. Their volume was assessed by agricultural organizations'

Table 3. Staffing of the Vologda Oblast agricultural enterprises
(as a percentage of the number of respondents)

| Personnel | Provision with personnel | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Satisfactory | | | | | Insufficient | | | | | Very low | | | | |
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2008 | 2009 | 2010 | 2011 | 2012 | 2008 | 2009 | 2010 | 2011 | 2012 |
| Agricultural workers in general | 76 | 65 | 49 | 43 | 53 | 24 | 30 | 44 | 53 | 33 | 0 | 2 | 7 | 5 | 9 |
| Highly qualified workers of leading occupations | 22 | 17 | 16 | 25 | 9 | 59 | 55 | 51 | 55 | 60 | 17 | 29 | 26 | 15 | 22 |
| Middle workers | 70 | 57 | 44 | 55 | 53 | 22 | 31 | 40 | 35 | 27 | 9 | 5 | 14 | 5 | 11 |
| Specialists | 78 | 47 | 49 | 60 | 58 | 22 | 37 | 42 | 35 | 24 | 0 | 16 | 9 | 5 | 11 |

Figure 3. Assessment of the level of capital investments in the development of the Vologda Oblast agricultural enterprises (as a percentage of the number of respondents)




managers as insufficient for expanded reproduction. In 2012, only 2% of respondents thought that the level of capital investments was optimal *(fig. 3)*.

As we can see, the share of managers, who called the level of capital investments insufficient and completely insufficient, has decreased for five years by 23 percentage points, and in comparison with 2000 it has reduced twice. The decline in the share of negative assessments is connected with the fact that many agricultural organizations under the relatively favorable economic situation took long-term loans for the renewal of fixed capital. Forecast evaluations of managers regarding the volume of investments in 2013 remained at the level of 2012.

Despite this fact, capital investments have allowed the condition of the facilities and infrastructure base of agricultural enterprises to be stabilized. As the survey results show, in 2012 main assets of enterprises were worn by an average of 58%, which is 5 percentage points lower than the level of 2011.

It should be emphasized that, according to 73% of interviewed managers of agricultural enterprises, the promotion of investment activity over the last years has been constrained mainly by high prices for equipment and construction materials, high interest rate on bank loans (73%), the necessity to repay debts (53%), shortage of working capital (33%; *tab. 4*).

Attracted funds remain the main source of investment for agricultural organizations. The majority of managers of the region's agricultural enterprises (76%) pointed out that they used bank loans in 2012 (in 2011 this figure was over 80%). 41% of respondents are satisfied with the terms of obtaining short loans, while a year ago this figure was 42% *(tab. 5)*. Banks granted long-term (investment) loans for the development of agricultural production on the terms that did not satisfy 36% of managers; meanwhile, almost half of respondents find it difficult to answer this question.

The main difficulties faced by the managers of surveyed organizations in the agricultural sector when obtaining a loan in 2012, were high interest rates – 82% (2011 – 67%), a long procedure of handling the necessary documentation – 38% and strict terms of obtaining loans against collateral – 27% *(tab. 6)*.

One of the positive changes in lending conditions over the past year can be found in a decline in the share of those who did not have difficulties in obtaining a loan.

However, the availability of credit resources has not influenced the innovation activity of enterprises. Their innovation activity, in the opinion of 20% of the managers, is reduced to the purchase of products tested in the foreign market (their share was 13% in 2011) [1, p. 130]. More than half of agricultural companies do not participate in innovation processes at all.

Table 4. Factors hindering the development of investment activity in agricultural enterprises of the Vologda Oblast (as a percentage of the number of respondents)

| Factors | 2000 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| High prices for equipment and construction materials | 32 | 84 | 71 | 62 | 75 | 73 |
| High interest rate on bank loans | 19 | 72 | 55 | 61 | 48 | 78 |
| Shortage of working capital | 25 | 70 | 64 | 58 | 55 | 33 |
| Necessity to repay debts | 19 | 35 | 66 | 54 | 63 | 53 |
| Untimely repayment of subsidies for the loans granted earlier | - | - | 64 | 23 | 18 | 29 |
| Absence of necessary contractors to execute works | 0 | 5 | 0 | 2 | 0 | 7 |

Table 5. Degree of contentment of the agricultural organizations' managers in Vologda Oblast with the terms of obtaining bank loans (as a percentage of the number of respondents)

| Answer option | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| *Short-term loan* | | | | | |
| Yes | 6 | 8 | 0 | 3 | 3 |
| Rather yes than no | 53 | 26 | 21 | 42 | 38 |
| Rather no than yes | 31 | 47 | 33 | 30 | 29 |
| No | 8 | 16 | 7 | 6 | 12 |
| It is difficult to answer | 3 | 3 | 5 | 9 | 18 |
| *Long-term (investment) loan* | | | | | |
| Yes | 0 | 0 | 0 | 3 | 3 |
| Rather yes than no | 27 | 17 | 14 | 27 | 15 |
| Rather no than yes | 39 | 33 | 19 | 27 | 18 |
| No | 15 | 43 | 7 | 12 | 18 |
| It is difficult to answer | 18 | 7 | 7 | 9 | 47 |

Table 6. Difficulties experienced by the heads of the Vologda Oblast agricultural enterprises in obtaining loans (as a percentage of the number of respondents)

| Answer option | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| High interest rate | 78 | 90 | 47 | 67 | 82 |
| Terms of obtaining loans against collateral | 62 | 42 | 40 | 52 | 27 |
| Long procedure of issuing a loan | 56 | 68 | 21 | 36 | 38 |
| Term of a loan | 33 | 8 | 14 | 6 | 9 |
| There were no difficulties | 4 | 3 | 9 | 18 | 6 |
| Refusal of a bank to grant long-term loans | 38 | 24 | 0 | 6 | 15 |

Only 4% of the surveyed agricultural organizations in the region had firm relations with scientific institutions and universities (in 2011 – 8%); 2% were involved in experiments and testing of innovations.

According to the producers, the key factors hindering innovation activities are the high cost of innovation (64%), lack of budgetary support from the state (58%) and lack of the required amount of own funds (53% of the interviewed managers, that is one-third below the 2011-level – 88%; *fig. 4*). Long payback periods of innovations (44%) and shortage of qualified personnel (40%) were also noted among the barriers hindering the innovation development of the region's agricultural sector.

Survey data allowed defining the direction and frequency of the implementation of the various innovations in the region's agriculture *(fig. 5)*.

As follows from the diagram, 62% of the agricultural companies – survey respondents, have annually or every few years applied modern materials (73% – in 2011), 57% have used progressive technology, 44% have mastered new distribution channels and 44% – have upgraded the cattle.

However, it is necessary to pay attention to the following negative results of evaluations: 56% of the agricultural enterprises have not used new remuneration schemes, 56% have not explored new kinds of production; 56% have not changed the management structure.

According to the majority of respondents (82%), the activation of innovation activity in agriculture is impossible without strengthening the state support. More than half of the respondents (58%) considered that the transition of agriculture to the path of innovation development requires the implementation of special target programmes in innovation sphere; 29% noted the importance of enhancing the integration of science with the production and changing its financing principles.

The positive point is the fact that during the last 5 years of observations the trend of the increase in the share of the respondents, highlighting the development of business relations between farms and the main AIC (agroindustrial complex) counterparties. The strengthening partnership was partly caused by the need to reduce the risks and the magnitude of the losses of agricultural enterprises as a result of worsening economic conditions.

As follows from the survey results, 58% of the interviewed managers of the farms in the region's agricultural sector (70% – in 2011) were satisfied with the relationship with suppliers and contractors in 2012 *(tab. 7)*. There was no serious criticism in the sphere of cooperation with tax authorities (53%), buyers and customers (49%).

In 2012, the share of respondents, indicating the counterproductive character of relations between agricultural organizations and banks, increased from 33% to 60%, in comparison to 2011, with insurance companies – by 18 percentage points (33% in 2011).

Figure 4. Factors, restraining the innovation activities of the Vologda Oblast agricultural enterprises, 2012 (as a percentage of the number of respondents)

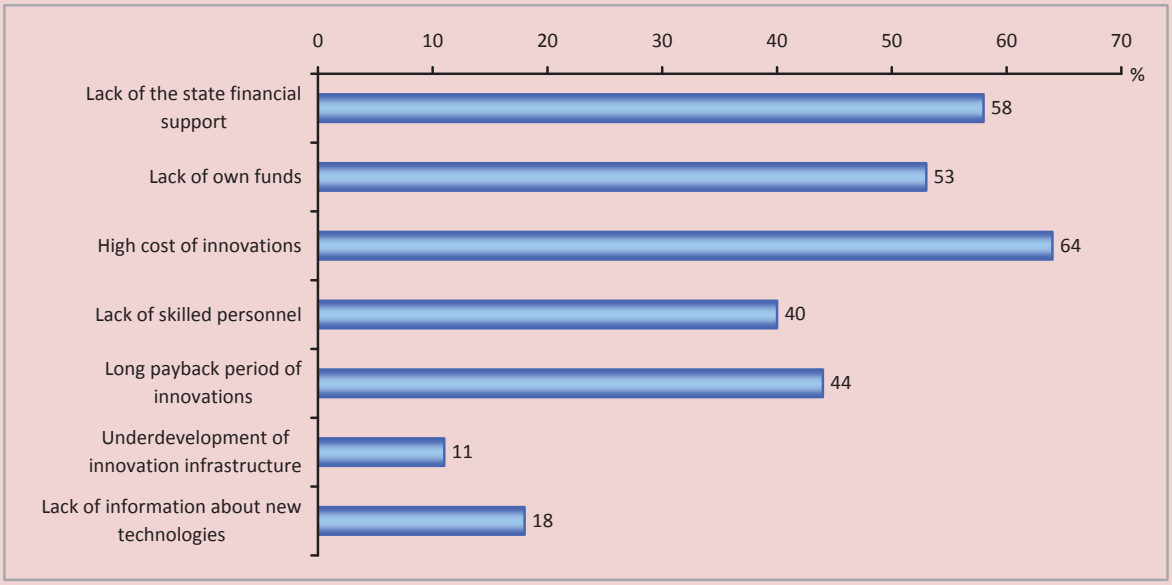



Figure 5. Frequency of the implementation of innovations in the Vologda Oblast agricultural organizations, 2012 (as a percentage of the number of respondents)

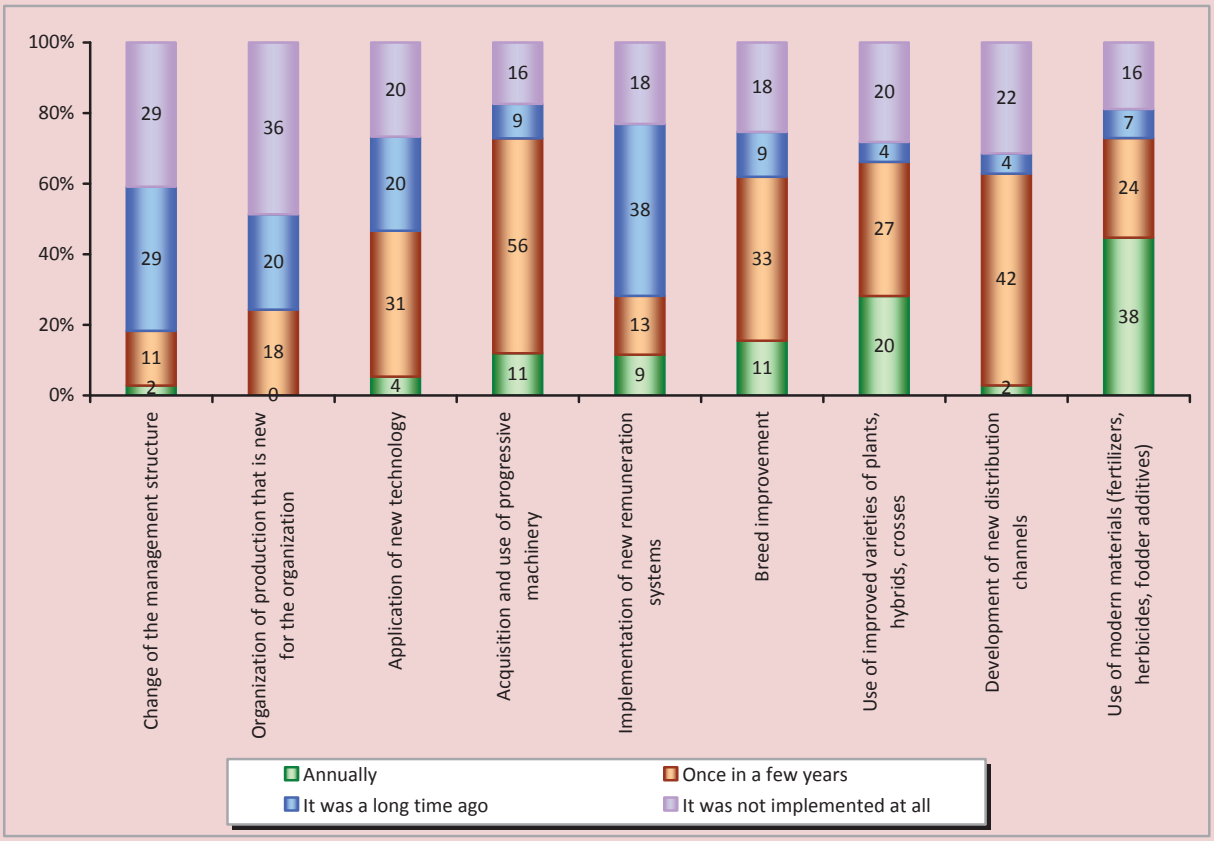


Table 7. Satisfaction of the Vologda Oblast agricultural managers with their relationship with single economic agents (as a percentage of the number of respondents)

| Economic agents | Answer | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Yes , rather yes | | | | | No, rather no | | | | |
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2008 | 2009 | 2010 | 2011 | 2012 |
| Suppliers and contractors | 65 | 74 | 58 | 70 | 58 | 35 | 26 | 40 | 18 | 36 |
| Banks | 68 | 58 | 54 | 63 | 33 | 33 | 43 | 44 | 33 | 60 |
| Buyers and customers | 65 | 47 | 54 | 68 | 49 | 35 | 53 | 35 | 13 | 44 |
| Tax authorities | 52 | 68 | 49 | 53 | 53 | 48 | 32 | 51 | 43 | 40 |
| Processing enterprises | 48 | 38 | 47 | 45 | 53 | 53 | 62 | 47 | 35 | 36 |
| Agroservice enterprises | 71 | 84 | 33 | 50 | 36 | 29 | 16 | 47 | 23 | 36 |
| Insurance companies | - | 33 | 28 | 55 | 31 | - | 67 | 58 | 33 | 51 |

Table 8. Places of the production distribution of the Vologda Oblast agricultural enterprises (as a percentage of the number of respondents)

| Place of distribution | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Regional market | 48 | 73 | 58 | 58 | 64 |
| Markets of neighbouring regions | 46 | 48 | 51 | 25 | 44 |
| Regional centre | 48 | 41 | 40 | 48 | 53 |
| Markets of neighbouring oblasts | 28 | 16 | 35 | 28 | 9 |
| Export to other RF oblasts | 35 | 11 | 12 | 15 | 22 |

As for the places of the production distribution of the Vologda Oblast agricultural enterprises, in 2012 the enterprises of the region's agricultural sector sold their products primarily in the regional market *(tab. 8)*. The share of farms supplying products in the regional centre increased (in 2012 – up to 53%) and in the markets of neighbouring regions (from 25% in 2011 to 44% in 2012). The export of production to other Russia's regions also increased (from 15% to 22%, respectively). As compared to the previous survey, the share of respondents selling its products in the markets of the neighbouring areas reduced almost 3-fold.

According to 76% (in 2011 – 78%) of the interviewed managers, processing organizations were the main consumers of the production of the enterprises of the agricultural sector in 2012. It can be noted that the distribution of the agricultural products by main consumers did not change significantly in 2012.

Over a third of the polled managers implemented measures on reducing the prime cost of production (43% of respondents – in 2011), and 29% were looking for new channels of distribution in 2012, in order to solve the problems concerning sales.

According to the survey results, 44% of the managers of the agricultural enterprises were only partially informed on the functioning conditions of the agricultural companies in the open market, a third of the respondents does not have the information concerning WTO at all.

To adapt to the working conditions imposed by WTO, one third of respondents is planning to assess potential benefits and losses, 24% – technical and technological re-equipment of enterprises, 13% – marketing research of market outlet, 11% is going to intensify the work on the standardization and certification of products; less than 10% – to organize production according to international quality standards and to train staff for WTO issues.

On the whole, 71% of the interviewed managers of agricultural enterprises consider they will have a number of negative consequences from the accession to WTO in the future, 22% of the respondents believe it will not affect the activities of the organization.

Table 9. Forms of budget support, provided to the Vologda Oblast agricultural enterprises (as a percentage of the number of respondents)

| Form of support | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Subsidies for purchasing combustive and lubricating materials | 80 | 88 | 84 | 73 | 77 |
| Subsidies for the purchase of fertilizers | 75 | 81 | 72 | 80 | 72 |
| Subsidies for partial compensation of expenses for paying interest on credits | 91 | 84 | 70 | 73 | 56 |
| Subsidies for livestock production | 34 | 28 | 51 | 23 | 36 |
| Subsidies o support livestock breeding | 64 | 30 | 33 | 20 | 21 |
| Subsidies to support elite seed production | 30 | 16 | 33 | 18 | 31 |
| Subsidies for partial payment of the insurance premium when insuring the harvest of agricultural crops | 30 | 21 | 9 | 5 | 0 |
| Subsidies for the planting and handling of perennial vegetation | 2 | 7 | 0 | 0 | 0 |

One of the main directions of the state policy is the budget support of agricultural enterprises. The results of the survey indicate that in 2012 budget support was provided to 87% of the region's agricultural enterprises – survey respondents (by 13 p.p. below the 2011 level), but 43% of the interviewed managers were not satisfied and the third of the respondents were extremely unsatisfied with the amount of the support. More than 70% of the managers in 2012 received grants for purchasing combustive and lubricating materials, 72% compensated the expenses for purchasing mineral fertilizers from the budget funds, 56% paid interest on bank loans *(tab. 9)*. The share of managers, who received subsidies for the support of elite seed production, increased (almost 2-fold, as compared with the 2011 level).

More than half of the managers of agricultural enterprises (56%) in 2012 considered the policy of the Russian Federation improper in relation to the agricultural complex (70% in 2011). However, the level of positive assessments in 2012 on the whole increased, as compared with 2011 *(fig. 6)*.

As compared with the results of the 2009–2012 survey, the share of managers, positively assessing the actions of the authorities, on the whole increased. It is necessary to improve the effectiveness of the already adopted measures for the development and implementation of new tools and mechanisms, promoting sustainable agricultural development.

According to the authors, the main steps that will improve the situation in the agricultural sector should be the reduction in prices for fuel and lubricants, mineral fertilizers and tax deduction. The same opinion is shared by the interviewed managers of agricultural enterprises *(tab. 10)*.

At that 27% of respondents note that the authorities should ensure the protection of the agricultural enterprises from monopolists, 24% believe it is necessary to take additional measures restricting the import of agricultural products and increasing the volume of procurement of agricultural products. 24% of respondents speak for the fight against corruption in the state structures, that is almost 2-fold lower than the 2011-level (43%).

Note, that the share of managers, who indicated the need for implementing the above measures of state regulation a year earlier, has also remained significant.

According to the authors, it is necessary to implement a complex of large-scale activities to ensure the sustainable growth of agricultural production in the region.

Thus, **at the federal level** it is necessary:

- to increase state control over the prices for fuel and lubricants, mineral fertilizers, equipment, electricity and other goods, acquired by agricultural enterprises (regulation of limit marked wholesale and retail prices);
- to conduct flexible customs-tariff policy to the benefit of national producers (rationalization of the import structure due to the

Figure 6. Distribution of the answers of the managers of the Vologda Oblast agricultural enterprises to the question: "Do you consider the modern economic policy with regard to the agrarian complex to be right?" (as a percentage of the number of respondents)

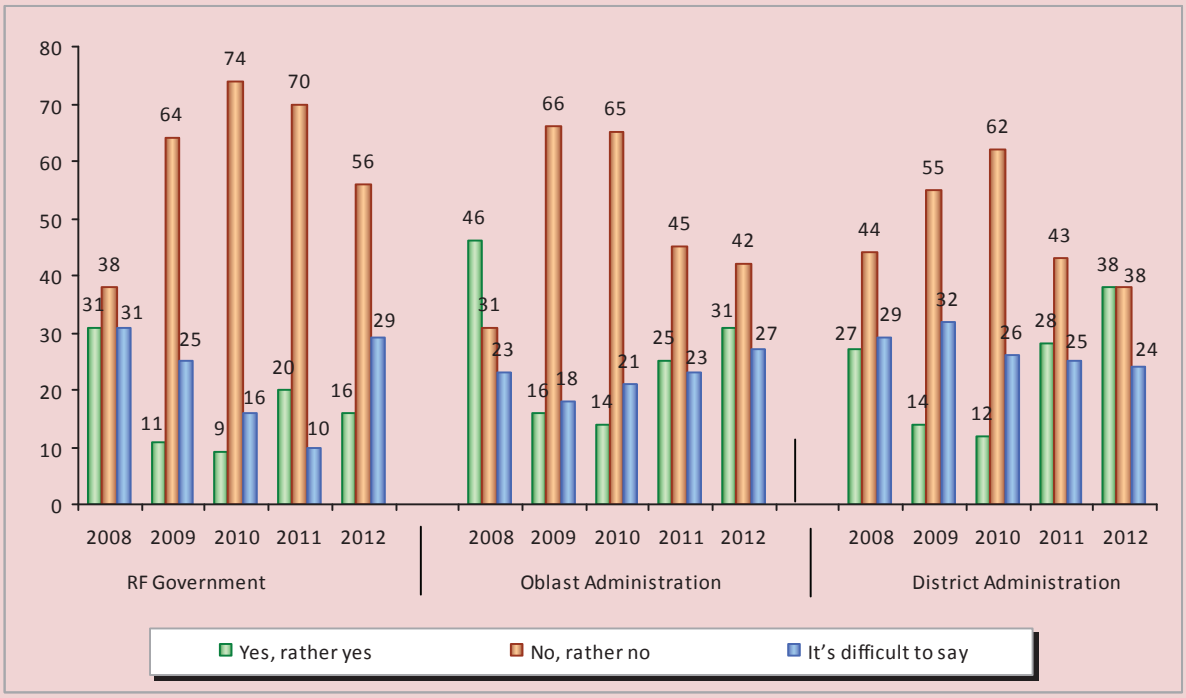



Table 10. The measures of government regulation, which are most important for the Vologda Oblast agricultural enterprises (as a percentage of the number of respondents)

| Measures of government regulation | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Reduction in prices for fuel and lubricants | 96 | 100 | 98 | 93 | 96 |
| Reduction in prices for mineral fertilizers | 83 | 80 | 86 | 78 | 89 |
| Tax deduction for manufacturers | 76 | 50 | 61 | 50 | 73 |
| Fight against corruption in the state structures (bribery) | 46 | 23 | 49 | 43 | 24 |
| Protection against monopolists – contractors or processors | 46 | 43 | 40 | 23 | 27 |
| Import restrictions | 41 | 46 | 30 | 30 | 24 |
| Improvement of the mechanism of the harvest insurance, the inclusion of agricultural machinery and animals in the insurance system | 37 | 27 | 26 | 15 | 16 |
| Development of the system of purchasing agricultural machinery under leasing agreements | 33 | 25 | 23 | 43 | 22 |
| Increase of the volume of procurement of agricultural products at guaranteed prices | 44 | 43 | 23 | 33 | 24 |
| Remission of a debt/ part of the debt on loans payable | 44 | 30 | 19 | 33 | 22 |
| Improvement of the investment climate (tax, customs and other benefits during the implementation of investment projects) | 41 | 27 | 16 | 13 | 16 |
| Stimulation of integration relations between agricultural organizations, processing and trading (agricultural holdings) | 17 | 18 | 14 | 10 | 11 |
| Land market development | 13 | 7 | 9 | 8 | 2 |
| Assistance in developing the branch unions of agricultural producers | 4 | 0 | 2 | 10 | 4 |

reduction in the share of finished products in order to create import substitution industries on the territory of the Russian Federation);

• to stimulate the development of integration ties of agrarian science and production (establishment of agro-technology park), etc.

**At the regional level**, the main state regulation measures concerning agricultural production are:

• increase in the volume of the budgetary financing of target programmes aimed at the development of agriculture and rural territories;

• activation of the works on agricultural staff retraining and professional development, including abroad training;

• increase of volumes of procurement interventions at guaranteed prices;

• organization of the activities of the services providing information about technical innovations and advanced experience to agricultural producers;

• adoption of additional measures on restructuring the debt of the agricultural organizations to creditors;

• development of relations between agricultural sectors, increase of the role of cooperatives in rural areas, etc.

However, the strategic directions for the stabilization and development of agriculture in the region, according to the authors, are the following:

• achievement of financial sustainability of AIC enterprises;

• technical and technological modernization of the agricultural sector;

• accelerated development of livestock and crop production;

• creation of highly skilled human resources and improvement of the staffing of agricultural production;

• increase in the volume of budget support.

Thus, the implementation of the given set of measures will bring the agriculture of the Vologda Oblast to the path of sustainable development. Otherwise, it may lead to the degradation of rural areas and food security decrease in the region.

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LBC 65.261.55(2Rus)


# Problems and prospects of social sphere financing in Russia

*The article contains an overview of such main trends in the financial support of Russia's social sphere, as growth in funding, priority increase of pension provision, maintenance of the priority role of centralized sources and evening-out the inter-regional inequalities. The article presents a scenario forecast of the social systems funding up to 2020, according to which the solutions of the main tasks of the coming years, which include adaptation to demographic changes and the elimination of disproportions in remuneration, will require joint efforts of the government, business, citizens and employees.*

*Budget, health care, culture, education, region, the North, social protection, social security, social expenditure, finance.*

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Currently both the authorities and society start to realize that, a healthy spiritual, moral, social and physical condition of a person rather than abstract indicators of economic and technological development of the state should serve as an objective of and criterion for the correctness of all the decisions made.

Moreover, in the course of active discussions on the directions and ways of the country's modernization, it became clear that the opportunities for moving toward a better society lie in the first place in the labour and creative potential of man rather than in the quantitative growth of economy. Academician O.T. Bogomolov expresses this thought as follows: "Intellectual, spiritual culture of the nation today, as never before, is becoming a major factor in the socio-economic progress. Modernization is impossible without sufficient cultural level of the population"[1].

In this connection, Russia found the issues of social problems very significant and acute, although they had been always present, but they became especially relevant in the period of market reforms at the end of the 20th century: the critical situation concerning the family and childhood, demographic problems, poor health and low life expectancy, significant inconsistencies in material prosperity, decline in general culture, raging crime, dependency and consumerism, all kinds of addiction: alcohol, drug, tobacco, telecommunications, gambling, etc. These obstacles are now seen as a major threat to development and national security.

[1] Bogomolov O.T. Capacity of the national culture in the renewal of the Russian society. Modernization of Russia: social-humanitarian dimensions. Ed. by Academician N.Ya. Petrakov; RHSF; RAS. Moscow; Saint Petersburg: Nestor Istoriya, 2011. P. 52-53.

However, we should emphasize once again that well-being of man should not be considered only as a *tool* of economic growth or maintaining the country's geopolitical importance, but it gets its real evaluation through the *prism of the meaning of life* of every individual. The Patriarch of Moscow and all Russia Kirill points out: "The countries and peoples that denied the importance of spiritual life, have disappeared from the historical scene. That is why, speaking about the economy and growth of well-being, it is necessary to remember their higher purpose, which consists in serving as the material basis for the spiritual growth of an individual, in serving the common good – material and spiritual, not hindering, but promoting the salvation of man"[2]. And not only public figures, but also economic scientists agree with that statement. "Life is valuable not because people can produce more and more material goods and services. Human needs go far beyond the economic framework, they are increasingly dominated by spiritual, aesthetic values", says, for example, RAS Adviser N.M. Rimashevskaya[3].

Proceeding from these positions, the observed increase in the attention to the social sphere[4] becomes clear, because the quality of life of every person to a great extent depends on its orientation and productivity: the *education* system provides the citizen's entry in society and preparation for employment; *health care* supports his/her normal physical condition; *culture* is to contribute to the spiritual and ethical development of a personality, to maintain the integrity of society and succession of generations; *social protection* ensures the stability of people's material welfare in different periods of their life and in different situations.

In turn, a key condition for the efficiency of functioning of these systems is their financial support, because finance is a monetary expression of actual economic processes and an effective tool of management. The financing of the social sphere can be considered as an important indicator, a kind of "touchstone" of inner strength and health of society. In a sense, it characterizes the attitude of authorities, as well as the majority of country's inhabitants towards their history, their present and future.

World economic history has a lot of different models of social sphere funding; almost all of them are known in Russia. In pre-revolutionary time it was an orientation toward independence, mutual assistance and patronage at a small amount of centralized financing. Then – the construction of the Soviet "welfare state" with the best possible support of the needs of citizens at the expense of the state budget. In the years of market reforms in the end of the 20th century it was the sharp reduction of social programmes due to economic slowdown and the revision of ideological objectives, when social stability was maintained mostly by inertia, existing traditions and enthusiasm of employees. However, to the threshold of the third millennium, negative consequences of ignoring the social sphere reached a critical level, therefore, since 2000, there has been a gradual return to acceptable standards of social security, and currently, as already noted in connection with wide discussions on the country's development strategy, the search for ways of improving the society has become a priority task.

[2] Kirill, Metropolitan of Smolensk and Kaliningrad, later: Patriarch of Moscow and all Russia. The economy is a type of activity initially blessed by the Creator. Real estate and investments. Legal regulation. 2008. No. 3 (36).

[3] Rimashevskaya N.M. Preservation of the people – the strategic imperative of Russia. Noneconomic edges of economy: unknown influence. Ed. by O.T. Bogomolov. Project supervisor B.N. Kuzyk. Moscow: Institute for Economic Strategies, 2010. P. 642.

[4] The social sphere in the present article is understood as the set of the following social systems: education, health care (including physical culture and sport), culture and social policy. Such components of social sphere as income and expenditures of population, housing and public utilities, environmental protection, etc. are not considered here. In turn, the social policy (or social security) includes the activities related in the budget accounting to the same section of the budget classification: pension provision, social security, social assistance and social services to the population, protection of family and childhood and applied scientific research into this sphere.

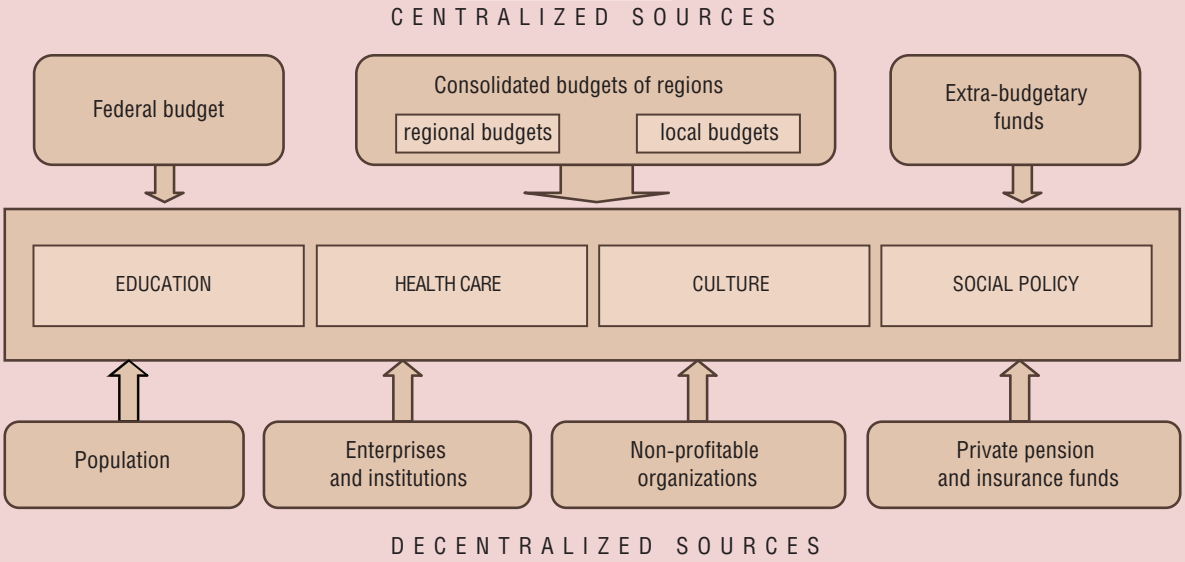
All of the above leads to the necessity of studying the state and main trends in the financing of Russia's social sphere at the modern stage of development, and also in the forecasting of the possible directions of its improvement.

**Sources of the social sphere financing.** Sources of the social sphere financing are divided into centralized and decentralized *(fig. 1)*. The *centralized* sources are funds that are at the disposal of the state and local governments, they function according to the rules obligatory for the whole territory of the country and for all its economic entities, and they are formed primarily at the expense of tax revenue and social insurance contributions. These include the federal budget, regional budgets, local budgets and state extra-budgetary funds – the pension fund, social insurance fund and obligatory medical insurance fund. Centralized sources play a leading role in the financing of social expenditures, providing over 80% of their total volume.

The main element of *decentralized sources*, which accounts for about 2/3 of their total amount, consists in citizens' expenditures on paid services in education, health and culture. Enterprises and institutions are also involved in private financing of social sphere in the form of direct payment for education, medical care, voluntary medical insurance, leisure and recreation of their employees and members of their families, co-financing of temporary disablement allowances and financial aid in difficult situations. Non-profit organizations (both domestic and foreign), which include charitable foundations, public and religious associations, professional unions, etc., provide financial support to the social sphere in the form of gratuitous payments. Private pension funds and insurance companies provide citizens with the opportunity of voluntary insurance in case of unavoidable or unforeseeable hardships. Unfortunately, the information about decentralized sources, apart from the funds of the population, is given in the open statistics not fully and is, therefore, not included in the analysis.

It is obvious that besides the statistically registered cash flows, in reality there are informal payments for services and numerous transfers between the groups of people of

Figure 1. The main sources of financing of the social sphere



different age and income, which are a kind of mechanism of social equalization. Attempts are being made to evaluate these informal cash flows using indirect methods, such as sociological surveys, but the information is fragmentary and, therefore, it has not been studied by the author.

**Trends in financing of social systems**. The past decade saw a *significant increase in social spending from all sources*. The main characteristic of the social sphere financing is its share in the gross domestic product, in other words, the share in the total economic prosperity of the people, which allows estimating the degree of attention of the latter to certain sectors, comparing their importance among themselves, and making international comparisons. In the period under consideration, the dynamics of the social sphere financing significantly exceeded the rate of economic growth; as a result, the total share of public and private social expenditure in GDP increased from 14.7 to 23.6% *(fig. 2)*[5]. An especially rapid increase in relative terms was observed in the period of financial and economic crisis of 2008–2009, when the Government of Russia, despite economic downturn, adopted the policy of complete fulfilment of social obligations. In general, it is certainly a positive trend, which confirms the thesis about the ongoing social rehabilitation of the country.

The search for the reasons for such a rapid increase in social expenditures opens the following significant tendency in the period under consideration – *giving priority to increasing the financing of social policy, and, first of all, pensions*. For 2000–2011, the nominal expenditures of the Pension Fund of the Russian Federation (excluding non-governmental pension funds) increased 16-fold, and as a percentage of GDP – from 4.7 to 8.7%, which ensured an overwhelming share of the total growth of social expenditures. This considerably improved pension insurance: the ratio of the average size of pensions to the subsistence level of a pensioner has doubled over these years – from 83 to 173% *(fig. 3)*. And indeed, the increase in the standard of living of pensioners in these years was evident. Thus, it became possible to overcome the abnormal situation of inconsistency of state pension payments even to the minimum requirements of life-support; it is a major step forward, and it simultaneously shows the real possibility of changing reality for the better with a strong and consistent political will.

However, it is unlikely that success in pension provision can be considered perfect and final. According to the Concept for the long-term socio-economic development of Russia, the average pension in 2016–2020 should reach 2.5–3 subsistence levels of a pensioner (and, judging by the forecast, this standard under certain conditions can be achieved). It is also important to note that the increase in the share of expenditures on pensions in GDP was largely conditioned by the significant increase in the relative number of elderly people, from 262 to 283 persons per 1000 population, and the country's economic recovery became a leading factor in the positive changes in the level of pensions and in the subsistence level. An equally important indicator like the ratio of pensions to the average size of accrued wages, which clearly characterizes the moral health of the society towards the older generation, for these years has remained almost unchanged, at about 36%. With regard to the assets of non-governmental pension funds, this figure increases to about 40%. If we focus on the best achievements of other states[6], comparing them with our own

[5] Here and further calculated by the author according to the data of the Unified Inter-Agency Information Statistical System (available at: http://fedstat.ru/indicator/data.do) and the data of the Federal Treasury of Russia on the execution of budgets (available at: http://www.roskazna.ru/reports/cb.html).

[6] Gurvich Ye. Principles of the new pension reform. Demoscope Weekly. 2012. No. 499–500. 20 February – 4 March.

Figure 2. The share of social expenditures in Russia's GDP for 2000–2012, %

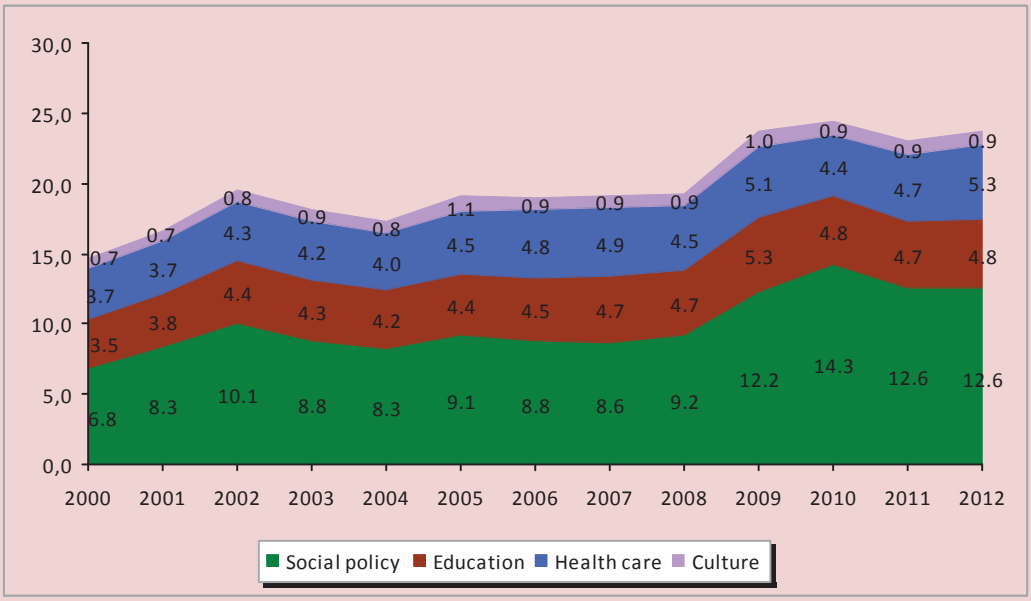
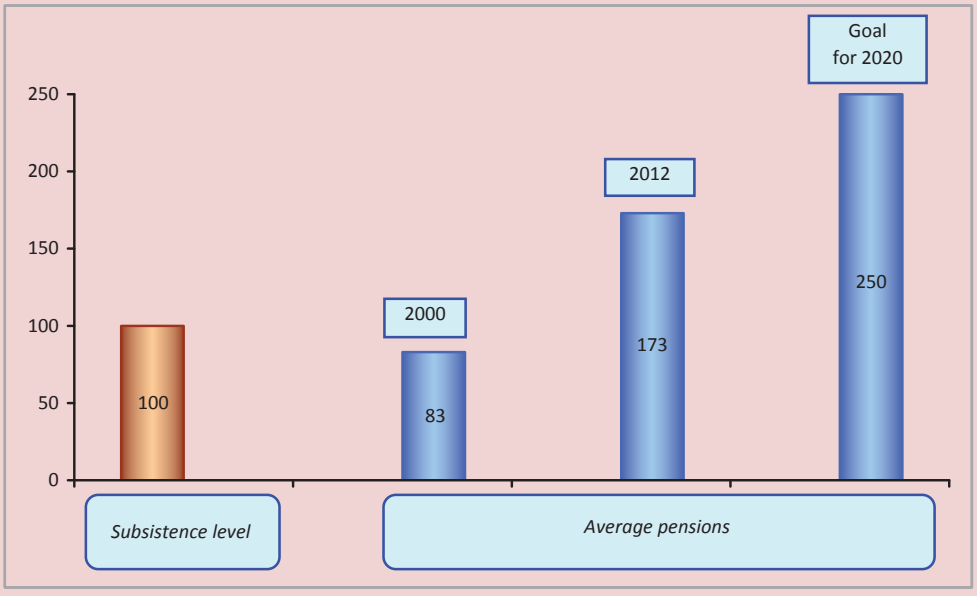



Figure 3. The ratio of average pensions to the subsistence level of pensioners in Russia for 2000–2012 and a target for 2020, %




ideas about the material welfare of elderly people, we should at least try to reach the standard of 50–60%.

However, to elaborate a final judgment on this matter, one should also consider the data on informal cash transfers, in other words, the direct financial support to the elderly on the part of able-bodied citizens. It would be interesting to move on from the application of the concept of average pension to the study of its differentiation by professional groups, in particular, the first group – civil servants and the military; the second group – the rest of the public sector employees (doctors, teachers,

workers of culture, social workers); and the third group – the non-governmental sector. Unfortunately, these data are not available to the author; besides, such a profound study is beyond the scope of this article.

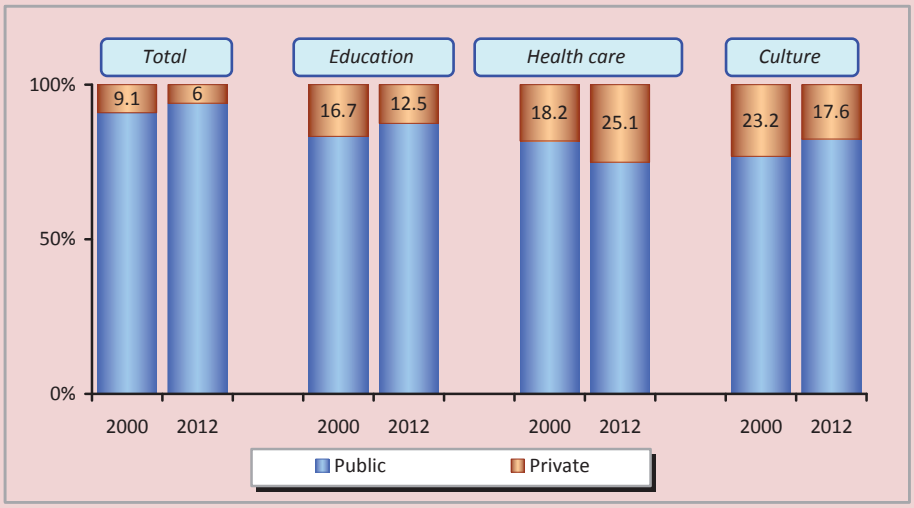
Naturally, the long-term trend of the social expenditures increase could not but affect the fiscal policy. The growth of social obligations demanded in 2011 a substantial increase of tax deductions from wages, which proved to be especially sensitive for small enterprises: for them the required payments in this regard have increased by 2.5 times. In 2013 the sharp increase in taxes affected individual entrepreneurs. In this situation of a greater concern is not so much the fact of tax burden increase (as will be shown further, it can become even greater), as its abrupt and hasty nature, and also the fact that the main burden of this growth has been imposed on the most vulnerable economic entities that do not have functioning mechanisms of consolidation and protection of their interests.

If the main "point of growth" of social expenditures in the 2000s was pension provision, then with regard to funds allocated to *education* and *health care*, the growth was much more moderate. Their value as a percentage of GDP has increased by 1.3% and 1.6% respectively, the highest peak was observed in the initial phase of the period under review. In general, we can say that over the last ten years, these areas have been developing according to the whole economy of the country. Although the financial support to education and health care during this period, has actually and substantially improved (months-long wage arrears became a thing of the past, the level of wages slightly increased, gradual modernization of equipment and premises has been carried out), this improvement, however, is in line with a general recovering economic growth of Russia during this period (for the last 12 years, the material prosperity increased approximately twice). We can not observe a deep, fundamental change in the role of education and health in the list of life priorities of the society, their share in GDP remains low against the background of not only developed countries but many developing countries as well. Only starting from 2011, there has been a turn in state policy in the direction of a more rapid increase of investments in these sectors, particularly in health care (see fig. 2), which may be the first sign of shifting the points of interest from social protection as the foundation of justice and stability of society to human capital as a decisive factor in development of the country.

The significance of *culture* in the structure of social expenditures during the period under review has increased slightly (from 0.7% to 0.9%), and it remains stable. However, observing examples of social and moral well-being of the modern Russian society, one can hardly consider this share to be sufficient. The reconsideration of the role of culture in the life of the country and the efforts undertaken for its improvement are reassuring, because it is the culture that largely protects the society from moral corruption and directs the vector of its development to higher ideals.

The analysis of social expenditures financing is impossible without consideration of the *structure of their sources*. Despite the fact that in conditions of increase in the payment for all types of services one may assume that the importance of private financing is leading and it is constantly increasing, the statistics prove otherwise. For 2000–2012 the share of decentralized funds in the total amount has even decreased from 9% to 6% *(fig. 4)*. Although, of course, the role of private sources is significant, it is not prevalent. Even though these estimates, due to the lack of comprehensive data, do not take into account some minor private cash flows like voluntary insurance (health, pension, life and health) and the funds of organizations that taken together, according to the author's assessment, do not exceed 5% of all the social expenditures, the share of centralized financing is nevertheless above 80%.

Figure 4. The ratio of public sources to private sources in the financing of Russia's social sphere in 2000 and 2012




Of course, this situation should not be regarded as a complaint about the lack of private funds participation in financing social projects and as a call for their increase. And this idea is very popular in scientific publications and especially in government programmes. The intentions of researchers and officials have their rational motive, which consists mostly in enhancing the efficiency of activity of budgetary institutions, sometimes the desire to overcome the "consumer" attitude to services received free of charge. One also refers to the experience of some Western countries, where the share of private funds is sometimes quite high.

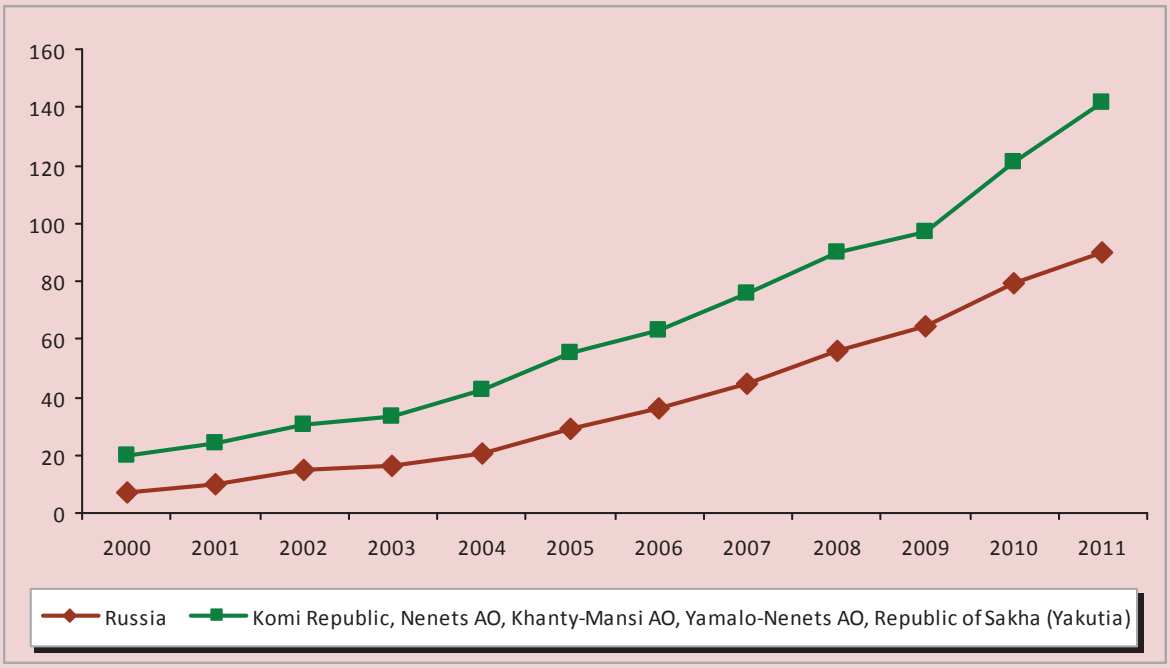
What could be said against that? The performance efficiency of budgetary institutions can be actually low and it should be raised, but it *should not be done using market methods*. The mechanism of commercial interest, which is often rewarding in the production sphere, can increase labour productivity in the social sphere as well, but it often leads to a decrease in its quality.

Especially it concerns the sphere of education and culture, where the driving force for specialists, in the first place, should consist in high spiritual and moral ideals of person's education, rather than short-term success in "coaching" and "cultivation" of the population. "The transformation of commercial activity of the mass media in their main function has sharply negative consequences for the development of the state and society", argues RAE Academician A.S. Zapesotskiy, and these words are true for the whole sphere of culture[7]. The decline in the quality of education, especially higher education, in the conditions of self-detachment of the state and a rapid commercialization is described in detail by Doctor of Economics I.V. Soboleva[8]. The viewpoint of these authors is supported by many other scientists.

[7] Zapesotskiy A.S. Media as a factor of transformation of the Russian culture. Noneconomic edges of economy: unknown mutual influence. Academic and journalistic notes of social scientists. Ed. by O.T. Bogomolov. Moscow: Institute for Economic Strategies, 2010. P. 230-260.

[8] Soboleva I.V. Development of education – a contribution to the future of the nation. Noneconomic edges of economy: unknown influence. Ed. by O.T. Bogomolov. Project supervisor B.N. Kuzyk. Moscow: Institute for Economic Strategies, 2010. P. 518-550.

Figure 5. Per capita financing of social expenditures in Russia's regions for 2000–2011, in current prices, thousand rubles/person




However, the presence of significant commercial component in the activity of the social sphere in other countries is not accidental; it is inextricably linked with centuries-old traditions of public control and social responsibility of business, which could not have formed in our country yet. One should not also forget the fact that budget funding in contrast to private funding is meant, inter alia, to be a powerful mechanism of social equalization, a universal guarantor of citizens' access to the opportunities for personal development. And the experience that Russia really should learn from other countries consists in their focus on providing centralized financial support to science and education, which intensified in the post-crisis period[9].

Political and economic changes of the 2000s have influenced the *inter-regional differentiation* of social spending. For instance, if in 2000 the most prosperous regions: Khanty-Mansi, Yamalo-Nenets and Nenets autonomous okrugs, republics of Komi and Sakha (Yakutia), having large profits from the export of hydrocarbons and other natural resources, were ahead of other regions by 2.7 times (20 thousand against 7 thousand rubles per person), then by 2011 this figure gradually decreased to 1.6 times (141 thousand against 90 thousand rubles; *fig. 5*).

Specific social expenditures in the North are objectively higher than in other regions of the country, it is connected not only with additional rental incomes, but first of all, with price-raising factors like severe climatic conditions, poor transport and other infrastructure, low population density, necessity to preserve the culture of indigenous peoples[10]. However, these objective reasons should not become an excuse to the localization or

[9] Ibidem. P. 543.

[10] A more detailed quantitative characteristic of price-raising factors is given in the work: Styrov M.M. Trends of social expenditures in the North of Russia. Economic and social changes: facts, trends, forecast. 2012. No. 2 (20).

excessive concentration of resource rent only within the very territories, because the natural wealth is the common heritage of the nation. Therefore, the fact that the growth in the above donor territories in the 2000s was somewhat restrained by the redistribution of funding in favour of backward territories deserves positive assessment, because it indicates the increasing consolidation of the country and the increase in the degree of solidarity between the territories.

**Forecasting of social expenditure**s. The overview of the situation allows us to proceed to the forecasting of Russia's social sphere financing in order to identify the opportunities and hidden threats under different options of the development of economy and society. It is expedient to harmonize the time period of forecasting with the majority of the country's strategic documents, i.e. to cover the period up to 2020, which refers the developed forecast to the category of long-term forecasts.

The main method of forecasting is modeling, under which the individual indicators are developed using extrapolation and expert assessments. The modeling is carried out within the framework of the scenario-based approach, which combines a content logical-heuristic analysis with formal research methods. The scenario is a hypothetical picture of a consistent development in time and space of events that constitute the evolution of a socio-economic object in the perspective that the researcher is interested in. The scenario-based approach provides for defining the area of what is really possible, i.e. the range of "probable paths" for the development of the studied system. For this purpose the scenarios with the best and the worst set of values of the factors affecting it are usually chosen[11].

The main elements of the model are GDP, the share of social expenditures in GDP and their internal structure, parameters of demographic dynamics[12].

The forecast under development should contain a search part and a normative part. The *search* forecast consists in the identification of possible states of the object in the future by extrapolating the development trends of the studied phenomenon in the past and in the present at abstracting from possible decisions that can influence these trends. Such forecast answers the question: what is likely to happen if the existing tendencies are maintained? The *normative* approach consists in identifying the ways and terms of obtaining possible desired states of the object based on pre-defined rules, ideals, incentives, and goals. In other words, it answers the question: what are the ways to achieve what is desired?[13]

The *search* forecast is carried out assuming that the ratio of public and private expenditures to GDP in the period until 2020 will be the same. This approach is passive, it does not require any specific solutions on the part of the authorities; and on the part of citizens it does not require significant changes in the usual amounts of their expenses.

In this case the social sphere financing in Russia will increase in line with general economic growth, the rate of which may reach 3–6% per year during this period, depending on the internal and external conditions[14]. Accordingly, the actual volume of social expenditures will increase during this period by 30% to 60%. This is no small figure. Being abstracted from other circumstances, it means,

[11] Forecasting of socio-economic development of the region. Ed. by V.A. Chereshnev, A.I. Tatarkin, S.Yu. Glazyev. Yekaterinburg: Institute of Economics, Ural RAS Department, 2011.

[12] The methodology of forecast calculations is described in detail in the work: Styrov M.M. Financing of social systems in the Northern regions of Russia: trends and prospects. Problemy prognozirovaniya. 2013. No. 4.

[13] Bestuzhev-Lada I.V. Social forecasting. Course of lectures. Moscow: Russian Pedagogical Society, 2002.

[14] Scenario conditions for the long-term forecast of the socio-economic development of the Russian Federation until 2030. Available at: http://www.economy.gov.ru

for example, the achievement of the target level "labour pension = 2.5–3 subsistence levels of a pensioner"; as for budgetary sphere workers, it means the growth of material prosperity comparable to that taking place in the period from 2000 to date.

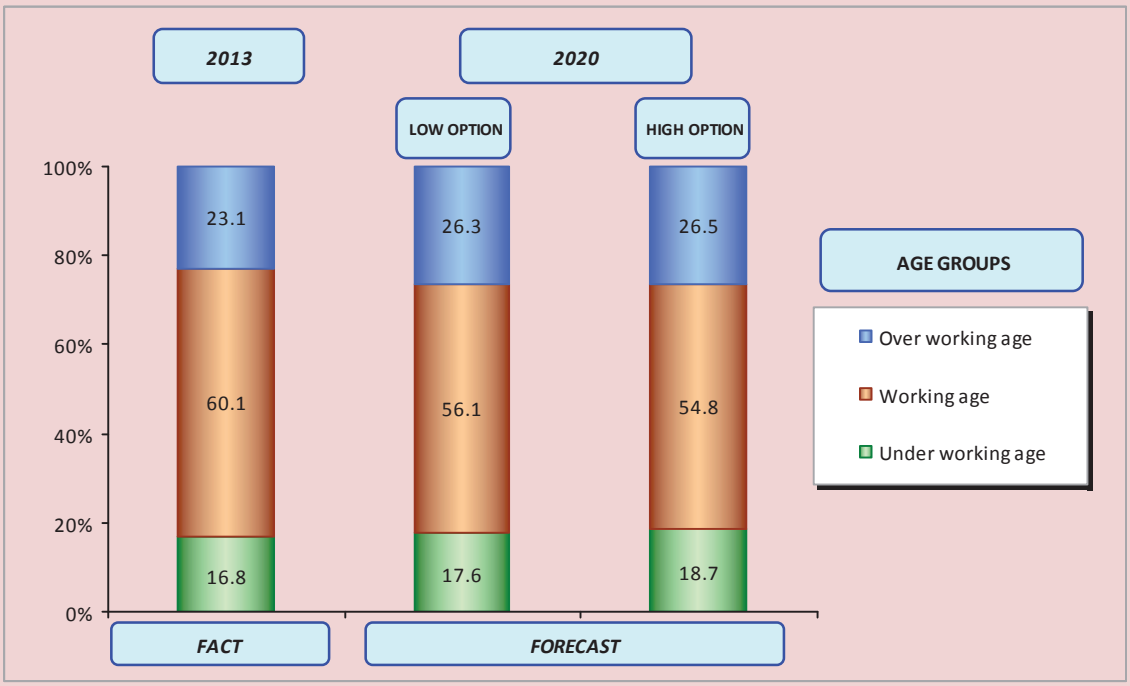
However, such an inertial scenario of social sphere development does not take into account the need to solve two major tasks, and so it is unlikely to be acknowledged as satisfactory.

The first such task is *demographic*. According to the forecast of Rosstat, after the unfavorable situation in birth rate over two decades, Russia will inevitably face a significant increase in the share of the population over working age in the total population, from 23 to 26–27% *(fig. 6)*. Therefore, under this scenario, labour pensions, due to a faster growth of the number of elderly residents, will grow much slower than the incomes of the entire population, i.e. the welfare of pensioners relative to other groups of the population will decrease, which will cause social tension. Even with regard to the fact that private funding sources in this sphere will make up for the acuteness of the problem to a sertain extent, it will be very significant and may require alternative control measures.

In addition, it is necessary to be prepared for a possible increase in the number of children. According to the low scenario of demographic forecast it will not change very much; but according to the high scenario, the moral and volitional elation of the nation and active government policy may lead to the increase in the share of children under 16 years old in the total population by almost 2%.

Therefore, the passive policy with regard to education system funding, for example, can result in an acute shortage of jobs and students in these institutions and in the excessive overload of the latter, or in shifting the state social obligations to the citizens themselves.

Figure 6. Forecast age structure of Russia's population in 2020*




* Estimated population of the Russian Federation until 2030. Available at: http://www.gks.ru/free_doc/new_site/population/demo/progn3.htm

All this has become a negative feature of a modern life, and it is the result of the short-sighted policy of the past years.

Naturally, the growth of demographic burden in connection with the increase in the relative number of children and elderly citizens will greatly expand the needs for health services and social protection (payment of "maternity" allowances, sick pays, etc.).

The second urgent task is *to overcome the existing imbalances in wages of public sector employees*. The scenario conditions of the inertial option make it clear that education, healthcare, culture and social protection will develop in proportion with the national economy in general. I.e., despite the growth of material prosperity of their workers in absolute terms, these sectors' lagging behind other economic sectors in terms of wage levels and other parameters remains unchanged. The current situation concerning wage level can hardly be considered favoufable for the solution of the task of Russia's recovery and harmonious development, stated in the beginning of the article.

The data in figure 7 indicate that the level of wages in pre-school education is almost twice lower than the economic average. Wages in secondary education, as well as in primary vocational and secondary vocational education are below the average wages approximately by 1/4. The level of wages in higher education in Russia in general practically corresponds to the average for the economy. Wages in healthcare lag behind by 20%, and wages in cultural establishments are below the average by almost 40%. Thus, all the key elements of the social sphere suffer from low labour remuneration. However, in recent years there has already been a steady reduction in the existing wage gap, yet not sufficiently dynamic. For example, in general education over the last five years this gap has decreased by 10%, in culture and pre-school education – by 4%, in health care and higher education – by 2%.

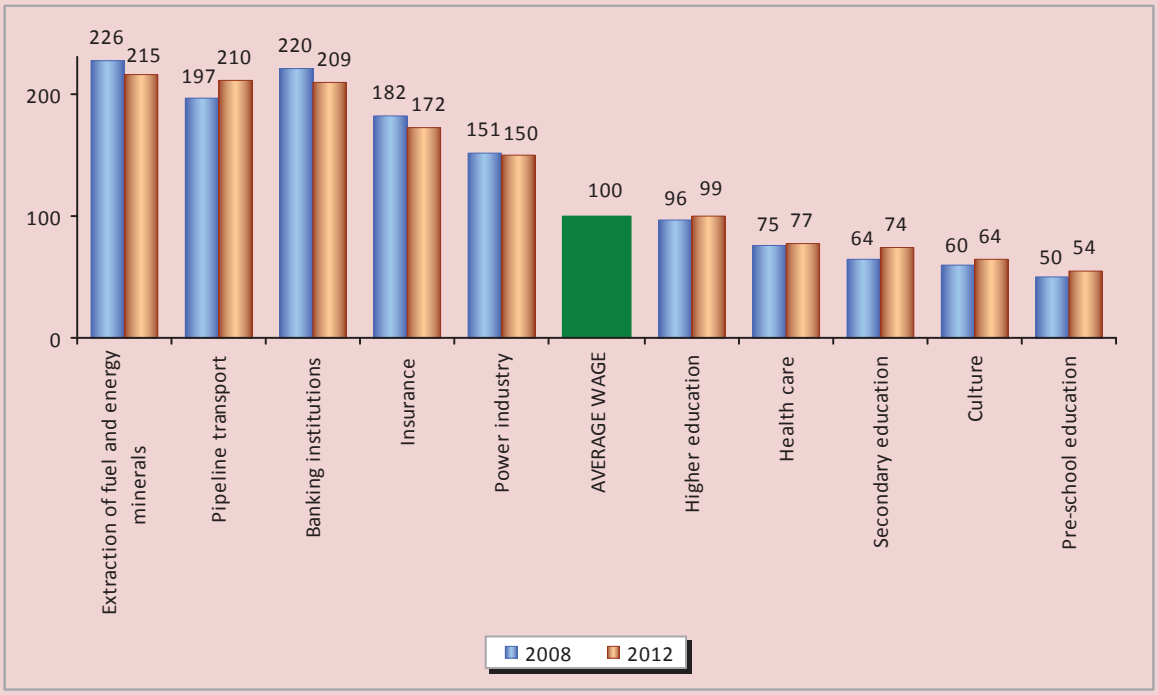
For comparison: official wages in the electric power industry amounted to 150%, in insurance companies – to 170%, and in banking institutions, in the extraction of energy resources and pipeline transport – to more than 200% of the economic average. The gap in wages between industry and transport can to some extent be explained by severe work conditions, but the dissonance between the social sector and financial institutions clearly indicates serious "faults" in the priorities of development of our society. But even here, in most cases, it is reassuring to note the gradual reduction in the income differentiation in comparison with the economic average, which leads to the levelling of the gap with regard to the social sphere, and it is considered to be the sign of movement toward the improvement of the situation in the country *(fig. 7)*.

Addressing these challenges requires a different scenario – the *target* scenario, in which the major importance would be attached not to certain growth rates of the welfare, but to justice and solidarity as a priority for socio-economic development and the main uniting force of the society: "Economy cannot be effective if it is not based on the principles of social justice and responsibility. But the desire to increase personal wealth is not the only motive that should be the driving force of economic relations. From the viewpoint of Orthodox ethics, another motive lies in the desire to help one's neighbour, desire to see that the results of the work bring benefits not only to the individual, but to the whole country and society"[15].

On this basis, a primary objective is to overcome the existing disparities in the remuneration of workers of the sectors responsible for the preservation and development of labour

[15] Kirill, Patriarch of Moscow and all Russia. Society, economy, ethics in the service of the Russian Orthodox Church. Noneconomic edges of economy: unknown influence. Ed. by O.T. Bogomolov. Project supervisor B.N. Kuzyk. Moscow: Institute for Economic Strategies, 2010. P. 107.

Figure 7. The ratio of labour remuneration in certain sectors to the average in Russia's economy in 2008 and 2012, %




and creative potential of the population – i.e. education, healthcare and culture. The level of labour remuneration indicates the actual evaluation of the importance of these systems for society by the authorities and the public. Decent wages in comparison with the remuneration of those employed in other occupations creates the *necessary* (although still insufficient) prerequisites for the fulfilment of proper functions by the workers in these spheres, not just rendering of "social services" to the rest of the population or "the development of personnel" for the needs of the economy, but the formation of genuine intellectual and moral leadership in the movement of the whole society to productive and healthy life. Labour remuneration should allow specialists to satisfy the vital needs of their families without bearing excessive labour loads and thereby create the conditions for increasing, first of all, the quality rather than the quantity of work performed.

Besides, these propositions imply the necessity of ensuring the maintenance of the reached parameters of social security for incapacitated (elderly and young) population by taking into account population dynamics.

The first steps in the implementation of the target scenario have already been made. The Decree of the President of the Russian Federation "On the activities for the implementation of the state social policy" dated May 7, 2012, No. 597 identifies the following targets to be achieved to 2018:

– bringing the average wages of pedagogical workers of educational institutions of general and pre-school education, teachers and masters of industrial training of primary vocational and secondary vocational education, the employees of cultural institutions, junior and medium-level medical personnel to *the average wage in the respective region*;

– increase in average wages of teachers at higher professional education institutions,

scientific associates and doctors *to the doubled average wage in the respective region*.

At first glance the specified benchmarks are very high, we may say, almost unattainable: the growth of wages should be about 70%. However, it is obvious that the priority development of the social sphere should be based more on structural changes than on high rates of economic growth. In this regard, the forecast of opportunities for achieving these targets has been carried out. The calculations are based on the data concerning the present level of remuneration of employees in the relevant spheres, the share of labour costs in the total amount of budget expenditures and the share of specialized workers in the general payroll fund[16]. According to the calculations, elimination of existing disparities in wages requires the increase in the social budget expenditures on education on the average by 22%, on health care – by 13%, on culture – by 17% over the base rate of economic growth.

The calculated growth rate of budget expenditures makes it possible to determine the share of social expenditures in GDP that ensures financial support for increased wages – 1.9%. The obtained value is very significant; however, it is quite feasible and it can be achieved by ordinary changes in the tax system or in the list of priorities for public spending.

However, as already mentioned, the target scenario stipulates not only the achievement of the desired level of remuneration in the public sector; it also ensures that financing parameters follow the demographic changes according to the high option of the forecast. According to the author's calculations, this will require the 2.4% increase in the share of social expenditures in GDP. Along with the increase in remuneration, the solution of this problem will lead to an overall increase in the social burden on the economy by 4.3% *(fig. 8)*.

Let us consider possible solutions to this problem. *The first approach*, the most simple and cardinal, consists in the coverage of this gap at the expense of the state with a corresponding increase in tax burden. However, such rapid growth in the tax burden on the economy would have dangerous consequences and would be difficult to implement, especially taking into account the recent increase in the rates. Therefore, the introduction of progressive taxation on super profits of citizens and enterprises should be considered as a major reserve, because the income gap between the richest 10% and the poorest 10% of Russia's citizens is currently exceedingly high, it reaches 17 times, and it is 30 times according to unofficial estimates[17]. The leading economists of Russia, for example, RAS Academicians O.T. Bogomolov, S.Yu. Glazyev, D.S. Lvov, V.L. Makarov, R.I. Nigmatulin, N.Ya. Petrakov, RAS Corresponding Member N.M. Rimashevskaya, Doctor of Economics A.I. Ageyev, Doctor of Economics A.V. Suvorov[18] and many public figures hold a unanimous opinion about this issue.

The approach to solving this problem should, in our opinion, consist not so much in the hasty strengthening of administrative pressure on business and entrepreneurs, but rather in a thorough and consistent work on the development of internal responsible attitude to their Motherland and the awareness of the inseparable connection of their own well-being with social rehabilitation of the nation.

However, the increase in public funding can and should be carried out not only by increasing tax burden. The considerable reserves can be

[16] The formula for calculation is given in the work: Styrov M.M. Financing of social systems in the Northern regions of Russia: trends and prospects. Problemy prognozirovaniya. 2013. No. 4.

[17] Ivanov V.N., Suvorov A.V. Incomes and consumption of the Russian population in the conditions of crisis and the alternatives of the state policy in this sphere. Problemy prognozirovaniya. 2009. No. 6.

[18] Modernization of Russia: social-humanitarian dimensions. Ed. by Academician N.Ya. Petrakov; RHSF; RAS. Moscow; Saint Petersburg: Nestor Istoriya, 2011; Noneconomic edges of economy: unknown influence. Ed. by O.T. Bogomolov. Project supervisor B.N. Kuzyk. Moscow: Institute for Economic Strategies, 2010.

found when revising the list of priorities of budget expenditures and also by establishing order in the use of funds. Let us leave concrete decisions within the competence of the heads of state and present some figures in confirmation of this suggestion: the required volume of additional financing of the social sphere in Russia as a whole amounts to about 2.7 trillion rubles (about 1/5 of the annual federal budget), at the same time, the total amount of the Reserve Fund and the National Welfare Fund of Russia is 5.3 trillion rubles and the total cost of the recent mega projects (South Stream gas pipeline project, Sochi-2014 Winter Olympics, APEC summit) is over 4 trillion rubles. Even the most cautious assessments of the scale of state and corporate corruption in the country are comparable to this value.

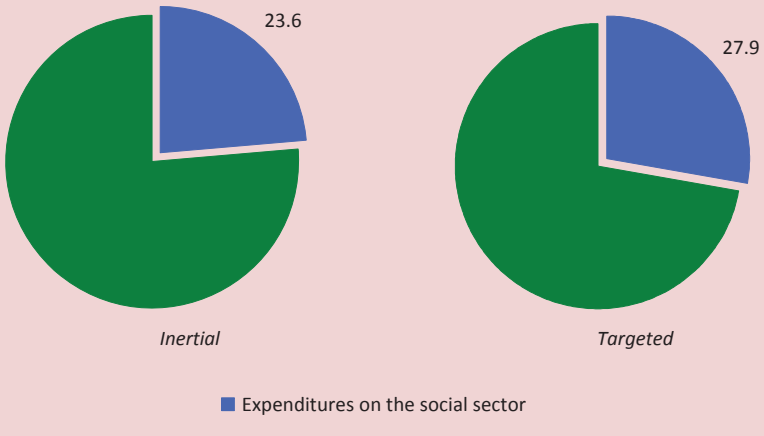
*The second, radical approach* is also completely unacceptable in our opinion; it suggests placing the entire burden of additional funding on the citizens themselves, on private businesses and non-profit organizations, since in such a case the costs of these economic agents should increase in relative terms in about 3 times, while the current load is often very burdensome for needy population groups.

Therefore, so as not to call the set tasks absolutely impossible, it should be recognized that their solution requires searching for compromises and unification of efforts of all interested parties. After all, a simple increase in budget expenses, even if it does not disturb the balance of the budgetary system, might not lead to the achievement of the second most important goal (along with the growth of well-being) – the increase in the quality of work of social systems.

In these years the authorities should carry out a gradual and differentiated increase in tax burden; they should enhance the efficiency of expenditures, prudently improve the labour remuneration system, enhance the principle of targeting of social benefits and free services depending on the welfare of recipients, possibly involve non-governmental organizations in the execution of state tasks.

Citizens and concerned enterprises should be morally and organizationally ready to increase the degree of their participation in the financing of education, health care, culture, social protection; they should also be prepared to the development of a more active position concerning the enhancement of their performance efficiency. The public sector employees should realize that the increase in labour remuneration cannot remain "mechanical" and "external" – it should be harmoniously linked to the increase in qualification requirements and a certain increase in labour intensity.

Figure 8. The share of social expenditures in Russia's GDP with regard to different scenarios in 2020, %



In conclusion, we would like to emphasize that the spiritual and moral revival of Russia is a necessary condition and the ultimate goal of the efficiency of functioning of all other aspects of life – economic, political, scientific-technological, cultural and social. At that, the moral condition of the people is a very complex and versatile phenomenon that depends not so much on political or economic decisions of the government, as on a vector of personal energy of each individual. But its complexity and comprehensiveness implies the involvement of all the existing mechanisms of public life, including, to a very large extent, the financing of the social sphere, which is the main idea of this article.

Thus, the main conclusions of the research are as follows:

• The welfare of Russia first of all, implies a thorough – spiritual, moral, physical and social – improvement of an individual.

• Inertial development of the social sphere will entail the conservation of existing disparities in remuneration and the reduction in the level of per capita financing of expenses due to the future increase in demographic load.

• Financial security is not the only, but, nevertheless, a very important factor in social development; therefore a priority goal of the social policy for the coming years consists in a significant increase in the expenses on education, health care and culture to ensure a decent level of remuneration.

• The main source of additional investments is to be found in the state finances through the revision of the budget policy priorities and the progressive taxation of super profits.

• The government policy measures are not enough for the efficient improvement of the socio-economic situation; it also requires the unification of efforts of all the interested parties.

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