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Informal Employment and Structural Imbalances in the Labor Market

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Abstract. The paper analyzes principles and mechanisms related to the development of informal employment, including at the regional level, where the accelerated growth of the informal sector is mainly caused by low living standards and lack of jobs, including in enterprises and organizations. The lack of skills, which is often a key aspect in the formation of labor shortages in regional markets, is mediated by relatively low budget expenditures on human capital. The hypothesis of the study is that structural imbalances in the demand for labor and its supply, one of the indicators of which is the extent of informal employment, determine the tension in the labor market. The aim of the work is to theoretically substantiate and empirically confirm the relationship between the extent of informal employment and the level of economic development, and to identify opportunities to reduce tension in the labor market. Statistical basis of the study includes Rosstat data; research tasks were solved using economic and mathematical analysis methods. The results obtained by analyzing statistical series confirmed the research hypothesis. In conclusion, we consider the possibility of structural and technological maneuver in economic sectors as an important factor in overcoming tension in the labor market. In particular, due to the labor-saving nature of such a maneuver, it is possible to significantly increase labor productivity by at least 15 million jobs. Construction and trade may become priority industry areas for workplace modernization in the coming years. The results of our calculations are considered as a preliminary assessment of the possibilities of labor productivity growth at the macro level, involving the development of special sectoral and regional programs to increase labor productivity, which is the practical significance of the results obtained.

Key words: informal employment, hidden employment, labor productivity, population incomes, labor remuneration, qualifications, regional labor markets, labor market tension, structural and technological maneuver.

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Introduction

In the context of an increasing labor shortage and record low unemployment rates, it is extremely important to substantiate the possibilities of economic growth, as well as factors that can compensate for the tension in the Russian labor market. According to our estimates, more than half of the employed population have a high potential for productivity growth (Uzyakova, Shirov, 2024)[1]. At the same time, the greatest potential for labor productivity growth is concentrated in the informal (hidden) economy, where the number of employees accounts for up to 30% of the total, and labor productivity is 20–25% lower than in the corporate sector (Uzyakova, 2022). In this case, the high a priori estimate of the potential for labor productivity growth is mainly due to the low initial level of labor productivity in this area, as well as the assumption of a gradual equalization of labor productivity in various sectors of the economy.

The level and changes of informal employment depend on economic growth, the number of jobs at the corporate sector, wages at enterprises and organizations, government policies to legalize the shadow economy, etc.[2] (Gimpelson, Kapeliushnikov, 2014; Nekipelova, 2019; Tumunbayarova, Antsiferova, 2018; Salin, Narbut, 2017). Informal employment is not always a factor that worsens proportions in the labor market (Chen, Xu, 2017). The shadow sector is often the only way to get a job for low-skilled workers, especially in regions with low living standards (Tumunbayarova, Antsiferova, 2018; Kunitsyna, Dzhioev, 2023; Salin, Narbut, 2017). However, this adaptive function of the labor market suggests that the entire economic system is not perfectly regulated (Gërxhani, 2004): the lack of high-quality (high-performance) jobs at the corporate sector, coupled with low economic growth rates, leads to a slowdown in income growth for the population and the state. And even introduction of a special tax regime for the self-employed, which provides for the unveiling of part of hidden employment, does not guarantee an increase in household incomes (according to our calculations, wages in the informal sector of the economy are 30% lower than in the corporate sector), although it provides some increase in government revenues.

An increase in wages in Russia is important not only for workers in the informal sector. There are industries and entire regions where wages are significantly lower than the Russian average. As a rule, the unemployment rate is high in such regions. In particular, some studies (Tumunbayarova, Antsiferova, 2018; Kunitsyna, Dzhioev, 2023; Salin, Narbut, 2017) reveal an increase in the level of informal employment with an increase in the unemployment rate. In this case, informal employment acts as a mechanism that mitigates social tension in the absence of jobs at enterprises. Consequently, with an increase in the number of jobs at the corporate sector and a decrease in unemployment, informal employment can be expected to decrease. International comparisons also demonstrate a similar trend[3] (Soto, 1995; Nekipelova, 2019; Hart, 1973; Voicu, 2012), though the scale of informal employment can vary significantly across countries and regions (Chen, Xu, 2017).

A significant place among the factors influencing the level and changes of informal employment is given to social, tax and other economic policies of the government, including migration policy (Kunitsyna, Dzhioev, 2023; Sim et al., 2011).

[1] These include, in particular, part-time employees, low-skilled workers, as well as those employed at jobs with high automation potential, and informal employment.

[2] International Labour Office (2002): Decent Work and the Informal Economy; Report of the Director-General; International Labour Conference, 90th Session; Report VI; International Labour Office, Geneva.

[3] International Labour Office (2002): Decent Work and the Informal Economy; Report of the Director-General; International Labour Conference, 90th Session; Report VI; International Labour Office, Geneva.

A number of publications[4] (Gimpelson, Kapeliushnikov, 2012; Nekipelova, 2019) hypothesize that the extent of informal employment is associated with a lack of high-quality jobs at the formal sector (especially at the regional level), including due to institutional obstacles to the development of small and medium business (Gërxhani, 2004). Predominance of the proportion of hired by individuals in the structure of informal employment (62% in 2023) confirms this hypothesis. The decrease in the proportion of the self-employed indicates a deterioration in the structure of the Russian labor market, since the earnings of informally employed hired people are significantly lower than those of those employed in organizations, while the earnings of the informal self-employed are higher than the corresponding indicators in the organized sphere (Gimpelson, Kapeliushnikov, 2012).

In our study, we assume that the level of informal employment, including in the regions of Russia, directly depends on the nature of economic development, which determines, on the one hand, changes of introduction of high-quality jobs (demand for labor), and, on the other hand, growth of incomes of the population and the state, creating prerequisites for improving quality of human capital (labor supply). Structural imbalances in the demand for labor and its supply, in turn, are becoming important factors determining the magnitude of tension in regional labor markets.

The aim of the work is to substantiate the relationship between the extent of informal employment as one of the indicators of the scale of structural imbalances and the level of economic development, and to formulate proposals to reduce tension in the labor market. Based on the stated aim, the tasks of the study are to assess the retrospective changes of informal employment in Russia by category; to study the relationship of informal employment with the level of regional economic development and incomes of the population; and also to assess the possibilities of eliminating sectoral structural and technological imbalances to reduce tension in the Russian labor market.

Methodological features of the formation of informal employment categories

For the purposes of this study, we will consider employment in the informal sector as categories methodologically formulated by Rosstat[5]. However, to determine the total number of the informally employed, which also includes the employed in informal jobs at the formal sector, we will use a balance method to estimate the amount of hidden (informal) employment in organizations.

The description of the calculation is as follows: if from the total number of people employed in enterprises and organizations (data from labor force surveys (LFS)) we identify categories that are not included in enterprise statistics (military personnel, those on parental leave to care for a child under 1.5 years old, adjustment for part-time employment[6]), then, based on the overall balance using the difference, hidden employment in the corporate

[4] Ibidem.

[5] According to the Rosstat methodology (On the approval of the main methodological and organizational provisions for conducting a sample survey of the labor force: Rosstat Decree 707, dated December 29, 2023. Available at: https://rosstat.gov.ru/storage/mediabank/pr707-29122023.pdf) the employed in the informal sector of the economy include the employed population aged 15 years and older, taking into account their main job:

1) entrepreneurial activity without a legal person status,

2) hired by individuals, individual entrepreneurs, or employed at a farm,

3) in self-owned household producing agricultural, forestry, hunting and fishing products for sale or exchange.

At the same time, the employed in the formal sector include the employed in enterprises and organizations with a legal person status.

[6] On the approval of the main methodological and organizational provisions for conducting a sample survey of the labor force: Rosstat Decree 707, dated December 29, 2023. Available at: https://rosstat.gov.ru/storage/mediabank/pr707-29122023.pdf; On the approval of the Methodology for calculating the balance of labor resources and estimating labor costs: Rosstat Decree 647, dated September 29, 2017. Available at: https://rosstat.gov.ru/storage/mediabank/pr647-17.pdf

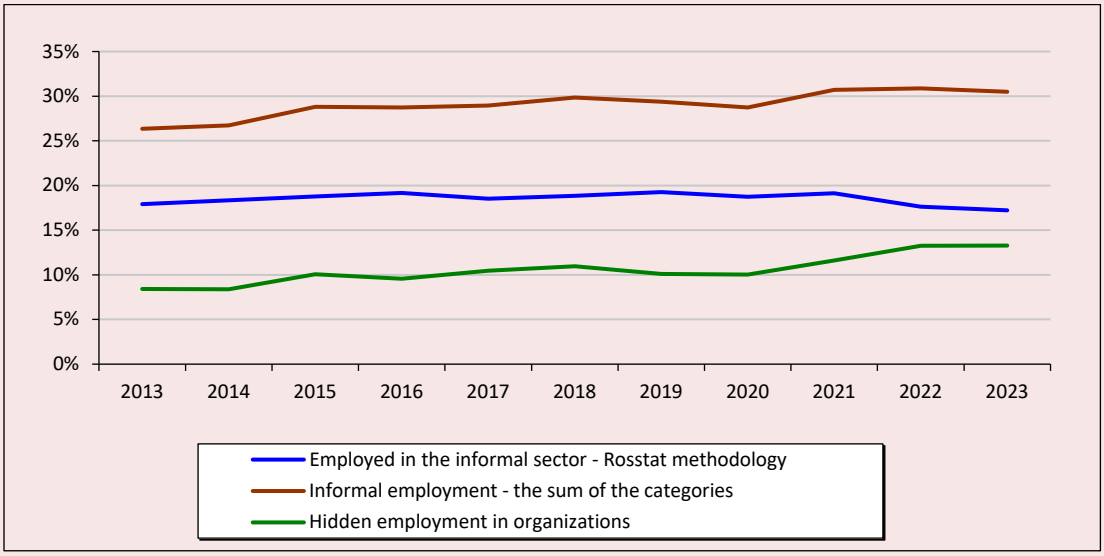
sector can be estimated. Considering P4 forms, as well as Rosstat statistics (LFS), the level and changes of informal employment (according to the Rosstat methodology and including hidden employment, respectively, in enterprises) are demonstrated in *Table 1* and *Figure 1*.

In 2023, the proportion of people employed in the informal sector (according to the Rosstat methodology) was 17.3% of the total number of people employed, but it increases to 30.6% if hidden employment in enterprises and organizations is included.

Table 1. Balance of estimates of labor force surveys (LFS) and enterprise statistics (form P4), million people

Indicator	2015	2020	2021	2022	2023
Total (LFS data)	72.3	70.6	71.7	72.0	73.5
In enterprises and organizations with a legal person status (LFS), including:	58.8	57.4	58.0	59.4	60.9
The average number of employees in a full range of organizations (enterprise statistics, form P4)	44.4	43.3	43.1	42.9	44.1
Employees in organizations included in the statistics of LFS, but not included in the average number (military personnel, those on parental leave to care for a child under 1.5 years old, part-time employment)	7.1	7.0	6.6	6.9	7.0
Hidden employment in organizations (balance of estimates of LFS and enterprise statistics), calculation	**7.3**	**7.1**	**8.3**	**9.5**	**9.8**
People employed in the informal sector, Rosstat methodology (LFS), including:	**13.6**	**13.2**	**13.7**	**12.7**	**12.7**
entrepreneurial activity without a legal person status	3.4	3.6	3.7	3.9	4.1
hired by individuals, individual entrepreneurs, or employed at a farm	8.5	8.7	9.1	7.8	7.7
in self-owned household	1.7	1.0	0.9	0.9	0.8
Sources: The results of sample surveys of the labor force over a number of years. Available at: https://rosstat.gov.ru/folder/11110/document/13265; own calculation.					

Figure 1. Proportion of various types of informal employment to the total value, % of the total value



Sources: The results of sample surveys of the labor force over a number of years. Available at: https://rosstat.gov.ru/folder/11110/document/13265; own calculation.

According to Figure 1, employment in the informal sector in the Rosstat methodology has been decreasing in recent years, while the amount of hidden employment in enterprises and organizations, on the contrary, has been increasing. This leads to a rise in the total value of informal employment. Indeed, if we keep in mind that the labor shortage that has formed in the market is associated with a shortage of workers in enterprises and organizations (as evidenced by a significant increase in the real wages of employees of organizations – by 7.8% in 2023, as well as the fact that almost the entire increase in the total number of employees in 2023 accounted for the growth of employment in the corporate sector), the decrease in employment in the informal sector (to the greatest extent – in self-owned households, by 122 thousand people) is a transfer of employed people from the informal to the formal sector of economy under the influence of an increase in the number of jobs, in shifts or wages. However, judging by the fact that hidden employment in organizations has also increased, it can be assumed that all this transfer has remained in the shadow sector. Moreover, it is estimated that hidden employment in organizations has increased by 210 thousand people over the past year, while employment in the informal sector has decreased by only 24 thousand people.

Our calculations demonstrate that if wages of the informally employed increased to the level of employees in organizations, the wage fund would grow by 9.8 trillion rubles (before personal income tax, calculated for 2023). The main question is how and due to what structural, technological and institutional changes in the economy can a significant increase in labor productivity and wages of informal workers be achieved?

Regional scale

We propose to substantiate the relationship between the employment rate in the informal sector and the level of regional economic development based on Rosstat statistics. According to *Table 2*, regions with lower per capita incomes and lower per capita gross regional product have a large number of informally employed people. In other words, there is an inverse relationship between indicators of informal employment and the level of economic development of the region.

A higher level of development in a region implies high economic and industrial activity (Moscow, Saint Petersburg, Nenets Autonomous Area, Murmansk Region, etc.) and, consequently, greater opportunities for creation and reproduction of an employment system and human capital of comparable quality. Under these conditions, the imbalances in the demand for labor and its supply are minimal. In regions with a low level of economic development, for example, where the per capita gross regional product does not exceed 45% of the Russian average (regions of the North Caucasus Federal District, the Republic of Tyva, the Republic of Buryatia, etc.), there are less such opportunities: absence or lack of large-scale production (corporate sector) leads to the expansion of forms of non-traditional labor relations.

Practically, a model of economic relations is being consolidated, in which low incomes of an economy become the cause and consequence of low quality (productivity) jobs.

Consequently, conditions for increasing incomes of the informally employed depend on government policies promoting capacity extension, development of the corporate sector and creation of high-paid jobs, especially in regions with low living standards, as well as measures to support socially vulnerable groups of workers and monitor compliance with labor legislation.

Regional distribution of informal employment is of particular interest, as it is a direct consequence of regional differences in the distribution of wages (incomes of the population). An analysis of the spatial distribution of incomes of the population can be useful in terms of assessing prospects for development of regional labor markets and growth

Table 2. Employed in the informal sector and the relative level of per capita monetary income and per capita gross regional product by region of the Russian Federation

Region	Employed in the informal sector, % of the total employed population, 2023	Average per capita monetary income of the population (relative to the Russian average), %, 2022	Gross regional product per capita (relative to the Russian average), %, 2022
Regions with the largest informal employment (more than 30%)			
Republic of Dagestan	44.1	74	31
Republic of Ingushetia	54.4	46	18
Kabardino-Balkarian Republic	44.5	67	28
Karachayevo-Circassian Republic	43.0	50	28
Republic of North Ossetia-Alania	39.7	65	35
Chechen Republic	41.7	68	21
Stavropol Territory	34.2	61	44
Altai Territory	37.2	62	39
Republic of Tyva	32.2	51	32
Republic of Buryatia	31.2	73	42
Regions with the least informal employment (less than 10%)			
Moscow	4.9	212	233
Nenets Autonomous Area	5.4	232	1101
Murmansk Region	7.3	139	179
City of Saint Petersburg	6.2	141	211
Khanty-Mansi Autonomous Area – Yugra	9.0	141	401
Chukotka Autonomous Area	2.7	255	329

Sources: Regions of Russia. Socio-economic indicators, over a number of years. Available at: https://rosstat.gov.ru/folder/210/document/13204; The results of the sample survey of the labor force, 2023. Available at: https://rosstat.gov.ru/folder/11110/document/13265; own calculation.

opportunities of the employed at the regional level. Ranking of the country's constituent entities by the amount of informal employment demonstrates that the number of poor regions in the country (in terms of incomes of the population) is large. If poor regions include those with the average per capita income below 70% of the Russian average, and in rich regions it is above 120%, respectively, then we get the following results (*Tab. 3*).

The presented ranking of regions is rather arbitrary: such tiers were chosen in order to visually simplify the analytical table. It should be said, however, that there are a large number of regions that are quite poor in terms of income, with borderline values near 70% of the Russian average per capita income. These regions include the Vladimir Region (72%), the Ryazan Region (74%), the Novgorod Region (75%), the Pskov Region (74%), the Republic of Dagestan (74%), the Republic of Udmurtia (71%), the Kirov Region (72%), the Chelyabinsk Region (74%), the Kemerovo Region (73%), the Republic of Buryatia (73%). Nationwide, only 19 regions have per capita incomes equal to the Russian average or higher than it, while the rest of the regions are lagging behind in development and have certain risks of realizing their social potential, among others.

As follows from Table 3, in regions with low per capita incomes, there are also low values of paid wages for employees in organizations, even after adjusting for regional price levels. Here, the informal sector (and the possibility of additional earnings) becomes an important factor promoting generation of additional income for the population.

Table 3. The relative level of the average monthly paid wage of employees in organizations in the regions of the Russian Federation, % of the Russian average level

	Average monthly paid wage of employees in organizations, 2022	Adjusted for price differences, 2022	Employed in the informal sector, % of the total, 2023	Unemployment rate, %
The poorest regions (less than 70% of the Russian average per capita income)				
Republic of Kalmykia	56	60	26.7	8.1
Republic of Crimea	64	66	28.0	5.0
Astrakhan Region	73	79	22.1	7.0
Volgograd Region	68	75	23.2	3.5
Republic of Ingushetia	50	56	54.4	28.5
Kabardino-Balkarian Republic	54	57	44.5	10.0
Karachayevo-Circassian Republic	54	59	43.0	9.8
Republic of North Ossetia-Alania	56	64	39.7	11.9
Chechen Republic	52	55	41.7	11.0
Stavropol Territory	63	65	34.2	4.3
Republic of Mari El	62	70	16.7	3.6
Republic of Mordovia	61	70	17.5	3.6
Chuvash Republic	64	72	20.1	3.2
Orenburg Region	67	77	24.0	3.5
Penza Region	63	72	27.1	3.7
Kurgan Region	64	71	21.0	6.5
Republic of Altai	67	65	37.2	9.8
Republic of Tyva	79	88	32.2	9.5
Republic of Khakassia	83	85	24.9	3.3
Altai Territory	60	62	24.0	3.7
The richest regions (more than 120% of the Russian average per capita income)				
Moscow Region	108	97	11.6	3.1
Moscow	192	136	4.9	2.2
Nenets Autonomous Area	164	134	5.4	7.4
Murmansk Region	134	114	7.3	4.8
City of Saint Petersburg	133	119	6.2	1.8
Tyumen Region	**145**	**138**	**13.0**	**2.7**
Khanty-Mansi Autonomous Area – Yugra	149	135	9.0	2.0
Yamal-Nenets Autonomous Area	201	169	12.2	1.7
Republic of Sakha (Yakutia)	**148**	**117**	**18.8**	**6.5**
Kamchatka Territory	**158**	**108**	**13.8**	**2.9**
Magadan Region	**186**	**134**	**16.1**	**4.1**
Sakhalin Region	**157**	**129**	**19.7**	**4.2**
Chukotka Autonomous Area	215	129	2.7	1.9

Source: Regions of Russia. Socio-economic indicators, over a number of years. Available at: https://rosstat.gov.ru/folder/210/document/13204; own calculation.

Informal employment is also high in some "rich" regions, such as the Tyumen Region, Yakutia, the Kamchatka Territory, the Magadan and Sakhalin regions. This situation may be related to the lack of jobs at existing enterprises and organizations, as well as to the structural imbalance in the demand for labor and its supply in the labor market (Korovkin et al., 2010; Korovkin et al., 2016).

In addition, in some regions with a high level of informal employment, the unemployment rate is high. Therefore, there is a greater potential for capacity extension and increasing the number of people employed due to both the contraction of the informal sector and the reduction of unemployment. There is a potential for expanding production in neighboring territories, taking into account the possible migration of the population to income-generating regions.

It is appropriate to discuss the issue of quality of the workforce in question. Perhaps the level of education and qualification of this labor force is that it cannot apply for more productive, and therefore higher-paid jobs. Indeed, as a rule, the level of education and the quality of human capital decreases along with a decrease in the income of the population, respectively, and opportunities for obtaining high-quality educational and healthcare services (Solow, 1956; Suvorov et al., 2014). It is the quality of human capital that is often the main reason why production facilities are forced to attract skilled labor from other, more remote regions.

Let us consider indicators of household and government expenditures on education and healthcare, which traditionally represent areas that form human capital (*Tab. 4*).

It is easy to notice a significant reduction in healthcare expenditure in the budget structure since 2010 in all the regions considered, though it is the greatest in regions with low living standards. In general, budget expenditures on human capital are decreasing over the period 2010–2022. And this is a significant problem of modern Russian society: the state does not demonstrate proper interest in the development of high-quality human capital (Mikheeva, 2021), and even more so in maintaining its efficiency (in all regions, the proportion of expenditure on healthcare is significantly lower than on education). If we turn, for example, to statistics on developed countries, we will see that healthcare expenditure is significantly higher than spending on education (total expenditure: capital and total current, from all sources): in the United States – by 10.3 p.p. of GDP, in Germany – by 6.9 p.p., in Japan – by 6.6 p.p., in Canada – by 5.2 p.p.[7]

Population expenditure on healthcare has decreased slightly over the period 2010–2022. It should be noted that population expenditures on education and healthcare in the expenditure pattern do not have significant differences depending on the living standard of the population. The population of poorer regions spends even slightly more on education in the expenditure pattern than the population in regions with a high living standard.

Government expenditure not only builds the image of the region, the image of its future development, it should create a favorable economic and social environment in which an attractive investment image of the region, confidence of the native population in the future, stable work and wages will be developed. This requires support not only for social programs, but also for programs to attract investment, develop transport and construction infrastructure. On the one hand, in regions with low wages, it is

[7] OECD data. Available at: https://data-explorer.oecd.org/vis?df[ds]=dsDisseminateFinalDMZ&df[id]=DSD_EAG_UOE_FIN%40DF_UOE_INDIC_FIN_GDP&df[ag]=OECD.EDU.IMEP&df[vs]=1.0&dq=..ISCED11_1T8._T%2BS13%2BS1D_NON_EDU%2BS2.INST_EDU...&pd=2015%2C2020&to[TIME_PERIOD]=true&vw=tb, https://data-explorer.oecd.org/vis?lc=en&fs[0]=Topic%2C1%7CHealth%23HEA%23%7CHealth%20expenditure%20and%20financing%23HEA_EXP%23&pg=0&fc=Topic&bp=true&snb=4&vw=tb&df[ds]=dsDisseminateFinalDMZ&df[id]=DSD_SHA%40DF_SHA&df[ag]=OECD.ELS.HD&df[vs]=1.0

Table 4. Expenditures on education and healthcare in the structure of consumer and consolidated budgets of the constituent entities of the Russian Federation, 2022

Region	Household expenditure on education		Household expenditure on healthcare		Expenditure of the constituent entity's consolidated budget on education		Expenditure of the constituent entity's consolidated budget on healthcare	
	% of total	p.p. 2010–2022	% of total	p.p. 2010–2022	% of total	p.p. 2010–2022	% of total	p.p. 2010–2022
The poorest regions (less than 70% of the Russian average per capita income)								
Republic of Kalmykia	3.5	1.0	1.9	0.7	32.5	7.9	6.8	-6.0
Republic of Crimea	4.7	4.7	1.7	1.7	16.7	-8.6*	7.8	-9.6*
Astrakhan Region	3.5	0.7	1.4	0.0	22.8	0.8	9.1	-7.2
Volgograd Region	4.7	0.8	1.3	-0.2	22.1	-2.1	10.5	-2.4
Republic of Ingushetia	1.5	1.0	0.0	-2.1	42.4	23.6	4.5	-4.6
Kabardino-Balkarian Republic	2.5	-0.3	0.4	-1.0	26.5	2.2	9.2	-1.4
Karachayevo-Circassian Republic	5.6	2.7	1.3	-0.1	23.9	3.7	4.8	-3.8
Republic of North Ossetia-Alania	3.9	0.0	1.8	1.0	26.1	2.6	6.9	-3.4
Chechen Republic	3.0	2.2	1.0	1.0	33.1	15.2	3.9	-8.8
Stavropol Territory	4.6	0.3	1.6	0.2	27.9	2.6	8.4	-1.6
Republic of Mari El	4.7	2.2	1.3	0.0	24.0	0.6	6.7	-4.6
Republic of Mordovia	5.3	2.4	1.1	-0.4	21.6	8.1	7.2	-7.9
Chuvash Republic	3.5	-0.2	1.5	-1.1	28.4	5.4	7.2	-3.7
Orenburg Region	4.1	1.3	0.9	0.0	27.0	3.4	8.5	-5.7
Penza Region	5.0	0.9	1.3	0.4	27.4	5.6	10.0	-0.7
Kurgan Region	4.1	1.3	1.1	-0.3	33.0	7.5	6.9	-4.6
Republic of Altai	4.1	1.2	1.7	0.3	30.7	6.5	5.0	-4.8
Republic of Tyva	2.2	0.3	1.8	-1.2	37.1	10.0	5.4	-6.5
Republic of Khakassia	4.5	1.0	1.1	0.0	30.8	-1.9	8.9	-1.3
Altai Territory	5.3	2.2	1.0	-0.5	28.8	1.0	8.3	-3.9
The richest regions (more than 120% of the Russian average per capita income)								
Moscow Region	3.9	1.1	2.2	0.9	25.2	3.1	12.4	-1.7
Moscow	2.7	0.3	1.7	0.6	12.7	-5.4	11.9	1.6
Nenets Autonomous Area	2.2	-0.9	1.6	0.1	19.6	-9.6	7.4	-0.7
Murmansk Region	4.8	1.9	1.1	-0.1	26.3	-1.8	9.2	-1.2
City of Saint Petersburg	3.5	0.6	0.8	-0.1	21.9	3.9	12.7	-4.6
Tyumen Region	3.3	1.2	1.8	0.6	18.7	6.3	13.9	3.5
Khanty-Mansi Autonomous Area – Yugra	3.0	1.0	2.5	1.8	28.4	2.5	15.7	-4.2
Yamal-Nenets Autonomous Area	4.5	2.9	1.7	0.5	22.5	-0.3	12.3	1.0
Republic of Sakha (Yakutia)	4.9	2.7	1.2	-1.4	27.7	-0.2	5.6	-4.3
Kamchatka Territory	2.4	-0.3	1.2	0.5	20.9	-1.3	8.1	-1.5
Magadan Region	2.9	0.5	1.7	1.0	24.9	4.9	12.0	-5.7
Sakhalin Region	4.1	1.0	1.9	1.0	17.7	-1.1	11.1	-3.9
Chukotka Autonomous Area	2.6	1.8	0.6	0.4	15.8	-3.7	6.6	2.8

*2015–2022
Source: Regions of Russia. Socio-economic indicators, over a number of years. Available at: https://rosstat.gov.ru/folder/210/document/13204; own calculation.

advantageous to create new capacities and build production facilities – labor costs will be relatively low. On the other hand, in such regions there may not be the main factors contributing to industrial development, namely transport and logistics infrastructure, construction industries, and the properly skilled labor force.

The scale of misalignment between labor supply and demand for it in regional markets can be estimated using the tension coefficient[8], which is calculated as the ratio of the average annual number of unemployed to the average annual number of vacancies reported by employers to employment services[9] (*Tab. 5*).

Table 5. Tension coefficients in regional labor markets, 2022

Region	Number of unemployed, thousand people	Demand for employees, reported by employers to employment services, thousand people	Tension coefficient, value	Place in the RF
Regions with the highest tension coefficient				
Nenets Autonomous Area	1.8	0.5	3.36	76
Republic of Kalmykia	10.9	1.6	6.84	78
Astrakhan Region	35.7	10.0	3.57	75
City of Sevastopol	10.3	2.9	3.59	72
Republic of Dagestan	173.5	1.4	120.40	84
Republic of Ingushetia	79.3	0.3	250.16	85
Kabardino-Balkarian Republic	44.7	3.2	14.13	80
Karachayevo-Circassian Republic	21.4	2.6	8.28	79
Republic of North Ossetia-Alania	38.0	1.1	35.41	82
Chechen Republic	72.0	1.9	37.04	83
Republic of Altai	9.3	0.6	15.55	77
Republic of Tyva	12.3	1.4	8.89	81
Tomsk Region	27.6	9.0	3.08	70
Republic of Sakha (Yakutia)	32.5	10.6	3.06	71
Trans-Baikal Territory	44.5	10.9	4.09	74
Regions with the lowest tension coefficient				
Tula Region	28.2	29.1	0.97	13
Leningrad Region	34.9	43.6	0.80	8
Murmansk Region	18.8	23.1	0.82	7
Tyumen Region	52.4	53.9	0.97	17
Khanty-Mansi Autonomous Area – Yugra	18.5	19.8	0.93	10
Yamal-Nenets Autonomous Area	5.3	13.0	0.41	1
Krasnoyarsk Territory	38.3	52.7	0.73	5
Primorye Territory	33.5	46.9	0.71	6
Khabarovsk Territory	18.4	22.6	0.81	9
Amur Region	16.8	36.6	0.46	2
Jewish Autonomous Region	4.0	8.0	0.50	3
Chukotka Autonomous Area	0.6	1.0	0.59	4

Source: Regions of Russia. Socio-economic indicators, over a number of years. Available at: https://rosstat.gov.ru/folder/210/document/13204; own calculation.

[8] Not to be confused with "tension in the labor market", a concept that we consider as a tense market situation associated with an increase in labor shortages. Both terms relate to tension in the labor market (misalignment between the demand for labor and its supply), despite the fact that conceptually they are opposite (one characterizes an excess of labor, the other – a deficit).

[9] Own calculation based on Rosstat data: Regions of Russia. Socio-economic indicators, over a number of years. Available at: https://rosstat.gov.ru/folder/210/document/13204

The high value of the tension coefficient indicates a significant excess of the number of the unemployed over the number of reported vacancies, which demonstrates the absence of production facilities in the region that absorb labor, as well as a shortage of workers with necessary qualifications. As a rule, a high coefficient value is observed in regions with a low living standard and a significant amount of informal employment.

A low coefficient value, on the contrary, indicates a shortage of labor. In this case the number of vacancies is much higher than the number of the unemployed. There are simply not enough workers in such regions, and the scale of misalignment between labor supply and demand for it indicates a lack of the properly skilled labor force. As a rule, these are remote regions with an unfavorable climate. Despite the fact that they are among the "richest", with high per capita incomes of the population, in some of them (Yamal-Nenets Autonomous Area, Chukotka Autonomous Area, Murmansk Region), the larger half of the employed population are semi-skilled workers.

The potential for reducing informal employment and tension in many regional labor markets, therefore, primarily depends on policies to create new production facilities and jobs in these territories. In addition, investment in human capital, retraining or refresher training of the existing labor force are an important factor promoting the growth and expansion of economic activity. The opportunity to use the territories' own labor potential can become an important competitive advantage of regional production facilities and a factor in the growth of social stability in cities and municipalities.

Structural and technological maneuver and balance in the labor market

The shortage of labor resources remains the most significant factor constraining development of the Russian economy in medium and long terms. At the same time, it is impossible to solve this issue by simply increasing the number of employees due to demographic, socio-economic and cultural limitations. In general, the solution to the problem is associated with an increase in labor productivity (Klepach, 2021; Roncolato, Kucera, 2014). However, the practical task is to determine the number of jobs and their quality, industries where they should be created, and technologies that should ensure conditions to achieve the desired productivity growth. An exhaustive analysis in all these aspects is hardly possible. Nevertheless, given the possibilities of Russian employment statistics, in particular their complementarity to some extent, preliminary results regarding rational directions for optimizing the use of labor resources can be obtained. The first thing that makes sense to try and do is to assess in which sectors and on what scale the reserves of labor productivity growth and labor force release are concentrated in the Russian economy. In this regard, it is appropriate to primarily provide a methodological comment on gathering statistics on the employed population and those categories of the employed, changes of which we will further analyze.

According to the Rosstat methodology, the employed include those aged 15 and over who, during the week under review, performed any activity (at least one hour per week) related to the production of goods or the provision of services for payment or profit. People who have been *temporarily* absent from the workplace for a short period of time are also included in the number of employees[10].

There are methodological differences in the collection of data on the number of employed people presented in the labor force surveys (LFS)[11]

[10] On the approval of the main methodological and organizational provisions for conducting a sample survey of the labor force: Rosstat Decree 707, dated December 29, 2023. Available at: https://rosstat.gov.ru/storage/mediabank/pr707-29122023.pdf; Labor and employment in Russia: Statistical book. Rosstat. Moscow, 2023.

[11] On the approval of the main methodological and organizational provisions for conducting a sample survey of the labor force: Rosstat Decree 707, dated December 29, 2023. Available at: https://rosstat.gov.ru/storage/mediabank/pr707-29122023.pdf; Labor and employment in Russia: Statistical book. Rosstat. Moscow, 2023.

and in the balance of labor resources (BLR)[12]. "In particular, the average annual[13] number of the employed (BLR) **does not include** *those who were absent from work due to maternity and parental leave until their child reached the age of 1.5 years, and military personnel*, but **includes** *those who were on long unpaid leave at the initiative of the employer, and migrant workers*"[14]. The BLR data on the constituent entities of the RF are collected at the place of work, not at the place of residence like the LFS data.

To sum up, the data on the average annual number of employed people (BLR) exceeds the LFS data by the number of *migrant workers and those who are on long unpaid leave at the initiative of the employer* (one of the types of underemployment or hidden unemployment). Analyzing the difference between sectoral values of the number of the employed, collected according to different methodologies, it is possible to realize how large this excess is (*Fig. 2*) and how, theoretically, this resource can be used within employment policy, bearing in mind different quality levels of jobs at different sectors.

According to Figure 2, the majority of such workers are in trade (40% of the total) and construction (35%), and their proportion in construction has increased by 17 p.p. since 2008. Most likely, we are talking about expanding market representation of migrant workers[15]. And a significant excess of the LFS data in scientific and professional activities (9% of the total) can be explained by the presence of employees who were on long unpaid leave (hidden unemployment). Their proportion has decreased by 13 p.p. since 2008.

These two very categories of employees we propose to consider first, given their significant weight in the general balance of labor resources.

1. Jobs occupied by migrant workers are usually low-skilled, which means they are low-productive, and their productivity growth depends on the level and speed of technological and structural changes. Based on the number of people employed in jobs with high automation potential, their proportion at the beginning of 2024 was 24% of the total number of the employed[16] (17.8 million people), 7% of them (5.22 million people) were low-skilled workers.

2. The involvement in the work process of a category of employees who have been on long unpaid leave at the initiative of the employer also depends on the level and changes of economic

[12] On the approval of the Methodology for calculating the balance of labor resources and estimating labor costs: Rosstat Decree 647, dated September 29, 2017. Available at: https://rosstat.gov.ru/storage/mediabank/pr647-17.pdf; Labor and employment in Russia: Statistical book. Rosstat. Moscow, 2023.

[13] The average annual number of employees of organizations is determined by summing the average number of employees for all months of the accounting year and dividing the amount received by the number of months (Labor and employment in Russia: Statistical book. Rosstat. Moscow, 2023).

"The average number of employees of organizations per month is calculated by summing the list of employees for each calendar day of the month and dividing the amount received by the number of calendar days of the month. Women who have been on maternity leave, those who have been on adoption leave since the birth of the adopted child, as well as on parental leave; employees studying in educational institutions who were on additional unpaid leave, as well as those entering educational institutions who were on unpaid leave to take entrance exams, are not included in the average number of employees. Employees who worked half-time are counted in the average number of employees in proportion to the hours worked" (Labor and employment in Russia: Statistical book. Rosstat. Moscow, 2023).

[14] Labor and employment in Russia: Statistical book. Rosstat. Moscow, 2023.

[15] According to the methodology (On the approval of the main methodological and organizational provisions for conducting a sample survey of the labor force: Rosstat Decree 707, dated December 29, 2023. Available at: https://rosstat.gov.ru/storage/mediabank/pr707-29122023.pdf), when calculating the BLR data, categories of people employed in the economy include the employment of foreign migrant workers: foreign citizens who have a work permit in the country, as well as foreign citizens who work without permits (EAEU countries).

[16] It was calculated as the sum of the categories "drivers and operators of mobile equipment", "assemblers", "sellers", "unskilled workers", the LFS methodology (On the approval of the main methodological and organizational provisions for conducting a sample survey of the labor force: Rosstat Decree 707, dated December 29, 2023. Available at: https://rosstat.gov.ru/storage/mediabank/pr707-29122023.pdf).

growth and the accompanying structural changes, on the opportunities to create high-performance, and therefore high-paid, jobs (it seems that in the case of scientific and administrative activities, we are talking about highly skilled labor), as well as the educational system's capacity to provide refresher courses to such employees or retrain them.

In 2022, the total number of employees included in the BLR statistics, but not included in the LFS statistics, was just over 5 million people and increased by 400 thousand people over the past 15 years (see Appendix).

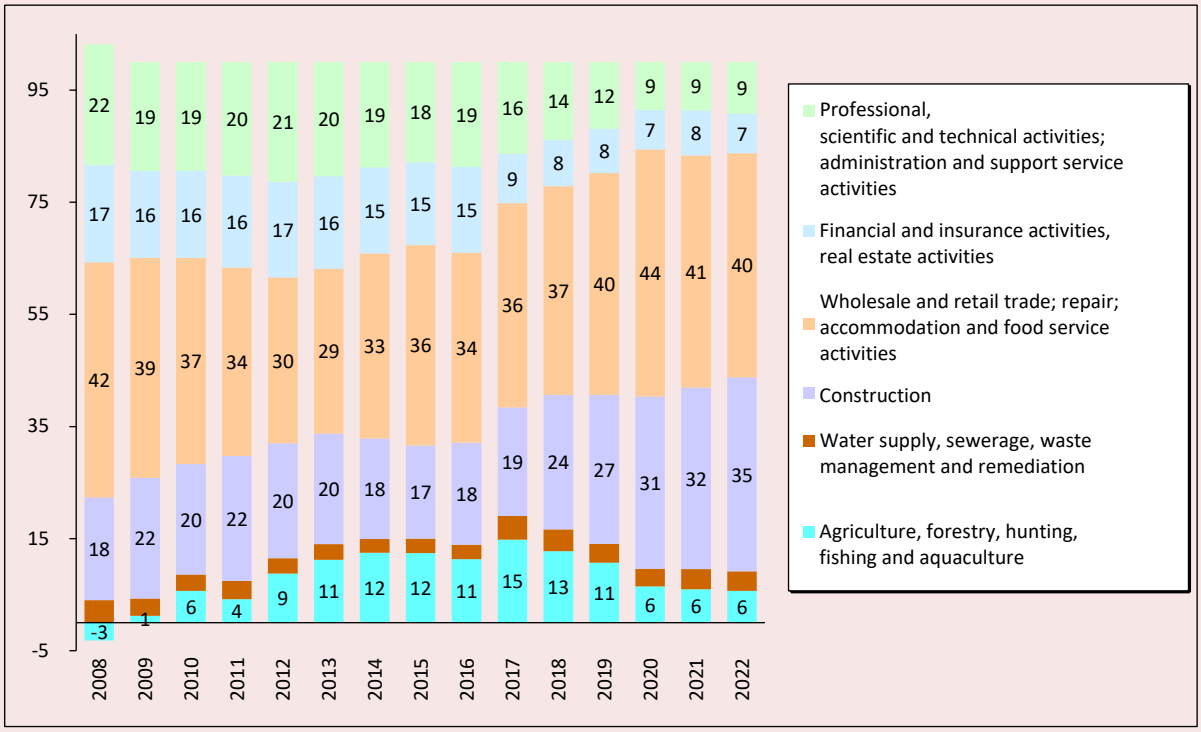
Such jobs represent a resource for the structural and technological maneuver in the economy aimed at a more balanced labor market. The content of this maneuver is to purposefully refresh capital and use other factors to increase labor productivity in sectors with relatively low job quality, release "surplus" workers and use them in other economic areas.

In turn, the excess of the LFS data over the BLR data concerns such categories of the population as military personnel and women on maternity leave to care for a child under 1.5 years old (*Fig. 3*). The majority of such potential workers are present in education (34% of the total), public administration (28%), healthcare (25%). Moreover, while this proportion is gradually increasing in education and healthcare, it is decreasing in public administration and military security. Even though these categories of employees could be a resource for reducing labor shortages, it seems that it would be difficult to involve them in the real production process.

Conclusion

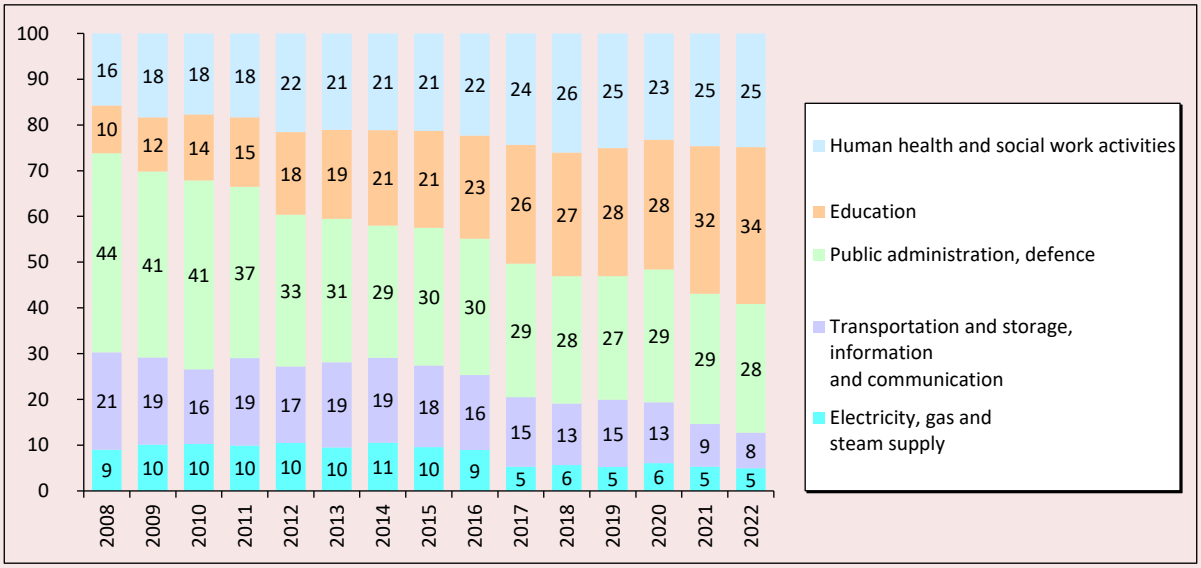
The described features of the development of regional and sectoral labor markets are, to some extent, a consequence of the established economic relations between economic agents of the Russian Federation. However, these very features should be

Figure 2. Excess of BLR data over LFS data by type of activity, % of total



Sources: Labor and employment in Russia: Statistical book. Rosstat. Moscow, 2023; The results of sample surveys of the labor force over a number of years. Available at: https://rosstat.gov.ru/folder/11110/document/13265; own calculation.

Figure 3. Excess of LFS data over BLR data by type of activity, % of total



Sources: Labor and employment in Russia: Statistical book. Rosstat. Moscow, 2023; The results of sample surveys of the labor force over a number of years. Available at: https://rosstat.gov.ru/folder/11110/document/13265; own calculation.

considered as the basis for generating the country's sectoral and regional development agenda, expanding opportunities and prospects for regional economic development, and improving the quality of life of the population.

Social policy of regional development is of particular importance, as it directly affects quality of human capital, income levels and living standards of the population. Tension in the labor market associated with record low unemployment rates is determined not so much by labor shortages as by imbalances in the skill structure of the demand for labor and its supply, slow structural, technological and institutional changes, and a lack of high-quality jobs in regions, especially those with low living standards, where informal employment is most likely to spread. In this regard, any concept of spatial development being elaborated should be based, among other things, on the specifics of creating regional policy in the area of income and employment.

The contribution of the conducted research to the growth of scientific knowledge is in studying the imbalances in the sectoral structure of data on the number of employed people, collected using various Rosstat methods, in order to assess the scale of the structural and technological maneuver in economic sectors affecting the efficiency of labor use (the level and changes of labor productivity).

According to the results of our calculations, based on the balance method and estimates of reserves of labor productivity growth in sectors, in order to ensure long-term economic growth, it is necessary to significantly increase labor productivity of at least 15 million workers by performing labor-saving structural and technological maneuvers. Construction and trade may become priority sectoral areas for job modernization in the coming years. Actually, we are talking about the need to develop and implement special sectoral and regional programs to increase labor productivity.

Appendix

Divergence of methodologies for calculating the number of employed people (LFS – BLR) by type of activity, million people

Type of activity	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total	-1.5	-2.1	-1.7	-0.9	-0.4	-0.5	-0.3	-0.1	0.3	0.5	1.0	0.9	1.1	0.9	0.8
Agriculture, forestry, hunting, fishing and aquaculture	0.1	-0.1	-0.3	-0.2	-0.5	-0.6	-0.7	-0.7	-0.6	-0.8	-0.7	-0.6	-0.3	-0.3	-0.3
Mining and quarrying	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5
Manufacturing	-0.1	-0.4	-0.2	-0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.2	0.1
Electricity, gas, steam; air-conditioning supply	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.2	0.2
Water supply, sewerage, waste management and remediation	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Construction	-0.9	-1.2	-1.1	-1.1	-1.1	-1.1	-1.0	-0.9	-1.0	-1.1	-1.3	-1.5	-1.5	-1.6	-1.8
Wholesale and retail trade; repair of motor vehicles and motorcycles, accommodation and food service activities	-2.0	-2.2	-2.1	-1.7	-1.6	-1.6	-1.8	-2.0	-1.9	-2.0	-2.0	-2.2	-2.2	-2.0	-2.0
Transportation and storage, information and communication	0.8	0.8	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.7	0.8	0.6	0.4	0.4
Financial and insurance activities, real estate activities	-0.8	-0.9	-0.9	-0.8	-0.9	-0.9	-0.9	-0.8	-0.9	-0.5	-0.4	-0.4	-0.3	-0.4	-0.4
Professional, scientific and technical activities; administration and support service activities	-1.0	-1.1	-1.1	-1.0	-1.1	-1.1	-1.1	-1.0	-1.1	-0.9	-0.7	-0.7	-0.4	-0.4	-0.5
Public administration and defence, compulsory social security	1.5	1.6	1.7	1.6	1.6	1.5	1.4	1.5	1.6	1.5	1.5	1.4	1.4	1.3	1.3
Education	0.4	0.5	0.6	0.7	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.4	1.3	1.5	1.6
Human health and social work activities	0.6	0.7	0.7	0.8	1.0	1.0	1.0	1.1	1.2	1.3	1.4	1.3	1.1	1.1	1.2
Other services	-0.5	-0.5	-0.4	-0.4	-0.4	-0.2	0.0	0.0	0.0	0.3	0.3	0.5	0.5	0.5	0.6

Sources: Labor and employment in Russia: Statistical book. Rosstat. Moscow, 2023; The results of sample surveys of the labor force over a number of years. Available at: https://rosstat.gov.ru/folder/11110/document/13265; own calculation.

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