

Employment and unemployment in Siberia*

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Abstract. This study is devoted to the complex assessment of labor markets of Siberian Federal District regions. Siberian Federal District is characterized by relatively low economic activity and permanent decrease in employment. In recent years, the growth of unemployment in Siberian regions was substantially higher compared to average growth in Russia. The study reveals the causes of the decrease in employment.

Keywords. Labor market, Employment, Labor force participation, Labor force, Unemployment.

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1 Introduction

Since 2013, the previous economic boom in Russia has given a way to its rapid deceleration and even stagnation. According to World Bank estimates the GDP growth rate declined to 1.3 percent in 2013 and 0.7 percent in 2014 following by decreases of 2.8 percent in 2015 and 0.2 percent in 2016. However, contrary to expectations, the economic crisis has not been accompanied by the subsequent deterioration of labor market outcomes in Russia. Over all the period the unemployment rate has not experienced any substantial increase and never exceeded 6.0 percent.¹ Moreover, the unemployment rate in the 4th quarter of 2017 was the same as in the 4th quarter of 2012 – 5.1 percent.

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¹ The data on unemployment are provided by the Russian official statistical agency, Rosstat. Rosstat uses the ILO methodology to define unemployed. The data are collected by monthly labor surveys.

The very different picture has been observed in Siberian Federal District, one of the eight Russian federal districts. Siberian Federal District has demonstrated the substantial deterioration of labor market outcomes in the analyzed period. Since 2014, the number of employed in Siberian Federal District has been declining every year. By 2017 the number of employed in the federal district had decreased by 1.7 percent compared to 2012, while a 0.2 percent increase was observed in Russia. In 2017 all 12 regions in the Siberian Federal District experienced unemployment rates higher than the Russian average. This phenomenon has not been investigated previously.

Labor market research is often conducted on the national level. However, there is a tendency of an increased attention to regional labor markets. There have been conducted numerous studies of labor markets of particular regions, usually those that substantially differ from the national outcomes for the worse. For example, we could name studies of regional labor market conditions in the Appalachian region in the US [4], [14], Uttar-Pradesh in India [29], [33], [25], Bihar in India [34], and so on.

Investigation of regional and local labor market has important implications for more general economic topics. For example, recent studies have shown that labor market consequences of trade differ through different regions. Therefore interregional differences have allowed researchers to investigate the impact of trade on unemployment, labor force participation, or wages [5], [24], [7], [12], [23], [2], [26], [11], [22], [8], [10]. Another promising usage of regional differences in labor market conditions is to reveal causes of the labor market polarization [1].

The labor market in Russia has been the research object in the numerous studies. Some non-typical features of the labor market in Russia has inspired the emergence of the concept “Russian model of labor market”. The typical feature of this model is that labor market shocks do not influence employment but cause wage cuts ([27], [3], [35], [17]). Various determinants of employment and unemployment in Russia were previously studied by Foley [13]; Gerber [15]; Grogan and van den Berg [20]; Lerman, Serova, and Zvyagintsev [30]; Gimpelson, Kapeliushnikov, and Lukiyanova [19]; Lehmann and Zaiceva [28]; Gurvich and Vakulenko [21]. At regional level, different issues of labor market were investigated by Shakhnovich and Yudashkina [32]; Gimpelson, Kapeliushnikov, and Lukiyanova [18]; Demidova and Signorelli [9]; Oshchepkov [31]; Giltman [16].

According to the neoclassical economic theory, the decline in employment could be caused either by the decrease of labor demand or by the decline in labor supply. It also could be a result of the labor market regulation by the state. These considerations determine the structure of the paper. The second section is devoted to the brief description of the employment and unemployment dynamics in Siberian Federal District. Section 3 investigates the causes that could decline the labor supply. Section 4 studies the dynamics of labor demand in Siberia. Section 5 concludes.

2 Employment and unemployment trends in Siberian Federal District

Siberian Federal District covers more than five million square kilometers, and all this huge area is a home for less than 20 million inhabitants. These people live mostly in big cities that are located far from each other. The long distances complicate the interregional migration.

Siberian Federal District includes 12 regions: the Altai Republic, Altai Krai, the Republic of Buryatia, Zabaykalsky Krai, Irkutsk Oblast, Kemerovo Oblast, Krasnoyarsk Krai, Novosibirsk Oblast, Omsk Oblast, Tomsk Oblast, the Tuva Republic, the Republic of Khakassia. All these regions are situated in the Asian part of Russia. Regions differ substantially by population, area, and living standards.

The overall negative dynamics in employment is formed by rather different trends in the regions. However, the decline has been observed in almost all regions, and the regions differ only by its magnitude and starting year (see Table 1). In 2016, only one region – Tomsk oblast – had the larger number of employed compared to 2011.

Table 1: Employment dynamics, percent (2008 = 100).

Regions	2011	2012	2013	2014	2015	2016
the Altai Republic	100.0	100.6	101.3	101	103.1	99.4
the Republic of Buryatia	100.0	100.6	100.2	98.8	98.4	96.6
the Tuva Republic	100.0	87.8	88.6	91	91.6	96.4
the Republic of Khakassia	100.0	96.2	100	96.7	98.7	97.5
Altai Krai	100.0	100.4	94.6	95.9	97.3	95
Zabaykalsky Krai	100.0	99.5	100.3	100.7	100.4	99.9
Krasnoyarsk Krai	100.0	100.6	100.6	101.9	99.1	98
Irkutsk Oblast	100.0	99.9	100.7	98.3	100.6	99
Kemerovo Oblast	100.0	100.2	102.9	101.7	97.7	97.2
Novosibirsk Oblast	100.0	100.8	100	100.6	99.5	99.7
Omsk Oblast	100.0	99.4	100.3	99.9	99.6	98.9
Tomsk Oblast	100.0	97.1	102.3	109.4	104.3	109.3
Siberian Federal District	100.0	99.8	100.0	100.2	99.2	98.6
Russia	100.0	101.0	100.8	101.0	100.6	100.7

Notes: calculated by authors using the Rosstat data.

3 Labor supply

The decline in labor supply could be a result of the population decline (namely the working-age) or a result of the decrease in labor force participation (LFP) rate. However, during the analyzed period the LFP rate in Siberia has increased. Moreover, the size of the increase was larger than the Russian average (see Table 2). In 2012-2016 the labor force participation rate in Russia increased by 0.8 percentage points, while in Siberian regions it increased by 1.3 percentage points by the same period. Some regions demonstrated a remarkable growth of the LFP rate. For example, the LFP rate in Tomsk Oblast increased by 6.8 pp., in the Republic of Tyva - by 5.8 pp. However, the rapid increase in LFP rate is mainly caused by the effect of a low base. In 2012 the LFP rate in the Siberian regions was 2.1 pp. lower the Russian average. Remarkably, in 2012 Altai Krai, Tomsk Oblast, and the Tuva Republic ranked 81st, 82nd, and 83th among 83 Russian regions. Even the major increase in the LFP rate in subsequent years did not allow the majority of Siberian regions to achieve the Russian average level.

Table 2: Labor force participation rate.

	2012	2013	2014	2015	2016
the Altai Republic	0.673	0.677	0.668	0.677	0.668
the Republic of Buryatia	0.639	0.638	0.638	0.645	0.639
the Tuva Republic	0.565	0.577	0.598	0.604	0.623
the Republic of Khakassia	0.647	0.658	0.644	0.659	0.657
Altai Krai	0.650	0.626	0.636	0.658	0.651
Zabaykalsky Krai	0.644	0.648	0.656	0.663	0.668
Krasnoyarsk Krai	0.686	0.688	0.696	0.689	0.684
Irkutsk Oblast	0.677	0.685	0.681	0.699	0.699
Kemerovo Oblast	0.667	0.677	0.679	0.670	0.674
Novosibirsk Oblast	0.690	0.687	0.686	0.691	0.698
Omsk Oblast	0.688	0.693	0.697	0.702	0.704
Tomsk Oblast	0.600	0.626	0.670	0.640	0.668
Siberian Federal District	0.666	0.668	0.673	0.677	0.679
Russia	0.687	0.685	0.689	0.691	0.695

Notes: source of the data: Rosstat.

As a result, the increase in the LFP rate together with the absence of employment growth was accompanied by the increase in unemployment (see Table 3). If Russian average unemployment rate during 2012-2016 persisted at a low level not exceeding 6 percent, the unemployment rate in Siberia raised from 7.1 to 8.0 percent. The substantial initial difference in the unemployment rate between Siberian average and Russian average in 2012 became much larger by 2016. The most severe unemployment was observed in the republics of Tyva and Altai, and

Zabaykalsky Krai, where unemployment rate exceeded 10 percent. The unemployment rate in the Tyva Republic is especially high putting it on the list of Russian regions with the highest unemployment rate. Since 2015, Tyva ranked second among all Russian regions by the unemployment rate, while in 2007 it was only the 6th.

Table 3: Unemployment rate.

	2012	2013	2014	2015	2016
the Altai Republic	0.116	0.115	0.104	0.097	0.120
the Republic of Buryatia	0.079	0.080	0.084	0.092	0.096
the Tuva Republic	0.184	0.193	0.191	0.186	0.166
the Republic of Khakassia	0.079	0.060	0.062	0.058	0.063
Altai Krai	0.062	0.083	0.072	0.080	0.086
Zabaykalsky Krai	0.106	0.105	0.100	0.104	0.108
Krasnoyarsk Krai	0.055	0.057	0.050	0.062	0.061
Irkutsk Oblast	0.078	0.083	0.088	0.082	0.088
Kemerovo Oblast	0.071	0.060	0.062	0.077	0.079
Novosibirsk Oblast	0.056	0.059	0.051	0.069	0.074
Omsk Oblast	0.069	0.068	0.067	0.068	0.072
Tomsk Oblast	0.084	0.076	0.076	0.077	0.072
Siberian Federal District	0.071	0.072	0.070	0.077	0.080
Russia	0.055	0.055	0.052	0.056	0.055

Notes: source of the data: Rosstat.

In 2012-2016 the number of unemployed grew both in Siberia and Russia overall. The source of this growth could be an increase in the unemployment rate or an increase in labor force. To obtain a quantitative impact of both factors, we made a simple decomposition of the change in the number of unemployed. We took into account that the number of unemployed U is a product of unemployment rate u and the number of people in labor force LF . By subtracting and adding $u_0 \times LF_1$, we received the following decomposition:

$$\begin{aligned} \Delta U &= u_1 \times LF_1 - u_0 \times LF_0 = u_1 \times LF_1 - u_0 \times LF_1 + u_0 \times LF_1 - u_0 \times LF_0 = \\ &= \underbrace{(u_1 - u_0) \times LF_1}_{\text{effect of unemployment rate change}} + \underbrace{(LF_1 - LF_0) \times u_0}_{\text{effect of labor force change}} \quad (1) \end{aligned}$$

where u is unemployment rate, U is the number of unemployed, LF is the number of people in labor force, 0 and 1 denote 2012 and 2016 years, ΔU is a change in the number of unemployed from 2012 to 2016.

We further decomposed the change due to the number of people in labor force (*effect of labor force change*) by the change in the working-age population P and the change in the labor force participation rate $LFPR$. The decomposition is similar:

$$\begin{aligned}
& (LF_1 - LF_0) \times u_0 = (LFPR_1 \times P_1 - LFPR_0 \times P_0) \times u_0 = \\
& = (LFPR_1 \times P_1 - LFPR_0 \times P_1 + LFPR_0 \times P_1 - LFPR_0 \times P_0) \times u_0 = \\
& = \underbrace{(LFPR_1 - LFPR_0) \times P_1 \times u_0}_{\text{effect of participation rate change}} + \underbrace{(P_1 - P_0) \times LFPR_0 \times u_0}_{\text{effect of population change}} \quad (2)
\end{aligned}$$

The results of the decomposition are presented in Table 4. From 2012 to 2016 the number of unemployed in the Siberian Federal District increased by 84.9 thousand people. The number of unemployed in Russia increased too, but all this increase was caused by the increase in Siberian regions. Without taking into account Siberian regions, the number of unemployed in Russia decreased in the same period. Thus, the number of unemployed in Siberia and the rest part of Russia moved in different directions. The regions in Siberia with the highest increase in the number of unemployed are Novosibirsk Oblast, Altai Krai, and Irkutsk Oblast. In total, the increase in the number of unemployed was observed in 9 out of 12 Siberian regions. In all these regions the increase was caused by the increase in the unemployment rate. The change in the size of the labor force did not substantially influence the changes in the number of unemployed. In 2012-2016 the labor participation rate increased, but it was fully compensated by the decrease in the working-age population.

Table 4: Decomposition of the change in the number of unemployed in Siberia in 2012-2016, thousand people.

Regions	Total change in the number of unemployed	Due to unemployment rate change	Due to labor force change
the Altai Republic	0.4	0.5	-0.1
the Republic of Buryatia	7.0	7.8	-0.8
the Tuva Republic	-0.7	-2.3	1.6
the Republic of Khakassia	-4.5	-4.4	-0.1
Altai Krai	25.3	27.5	-2.2
Zabaykalsky Krai	1.3	0.9	0.3
Krasnoyarsk Krai	6.2	7.9	-1.7
Irkutsk Oblast	12.4	12.3	0.1
Kemerovo Oblast	8.8	10.9	-2.1
Novosibirsk Oblast	26.9	26.2	0.7
Omsk Oblast	3.7	3.8	-0.1
Tomsk Oblast	-1.9	-6.5	4.6
Siberian Federal District	84.9	87.0	-2.0
Russia	39.1	46.5	-7.3
Russia (without Siberia)	-45.8	-40.5	-5.3

Notes: calculated by authors using the Rosstat data.

Aggregate data could mask the heterogeneity of the labor market behavior, therefore it is more beneficial to use microdata for the detailed analysis. We use microdata of the Labor Force Survey that is a monthly survey conducted by Rosstat. It covered all Russian regions. It is the main source of the official statistics on the labor force, employment, unemployment, and informal employment. Each month about 70,000 people aged 15-72 are surveyed. We use data for 2012-2015 because microdata for the year 2016 were not available yet. The main observed trends appeared before 2016, so the microdata provide enough information for the analysis.

Firstly, we calculated labor force participation rate by age groups (see Table 5). We determined the age groups boundaries by the main life cycle transitions in Russia and Siberia particularly. For example, at age 23 many university graduates enter the labor market, while at age 51 majority of those who experience hard working conditions in Siberia become eligible for the early old-age state pension. For comparison, we chose the years of 2012 and 2015. In 2012 the labor force participation rate was at the lowest level in the Siberian Federal District, and then it gradually increased. Given the limits on the paper length, we present the data for only several Siberian regions. We chose those regions that are characterized by the lowest and highest labor force participation rates.

Table 5: Labor force participation rate by age groups.

(a) 2012					
	15-22	23-40	41-50	51-64	65-72
the Tuva Republic	0.151	0.739	0.788	0.441	0.060
Altai Krai	0.185	0.879	0.895	0.528	0.075
Novosibirsk Oblast	0.287	0.874	0.888	0.600	0.146
Tomsk Oblast	0.170	0.841	0.898	0.434	0.049
Siberian Federal District	0.257	0.857	0.882	0.544	0.103
Russia	0.259	0.881	0.909	0.594	0.111

(b) 2015					
	15-22	23-40	41-50	51-64	65-72
the Tuva Republic	0.191	0.758	0.801	0.476	0.199
Altai Krai	0.175	0.869	0.899	0.522	0.093
Novosibirsk Oblast	0.261	0.866	0.884	0.555	0.184
Tomsk Oblast	0.177	0.840	0.912	0.493	0.102
Siberian Federal District	0.238	0.857	0.889	0.544	0.138
Russia	0.219	0.881	0.913	0.580	0.125

Notes: calculated by authors using the Labor Force Survey data.

Table 5 shows that the gap in the LFPR between Siberia and other Russia exists mainly due to the gap in the most productive age groups - from 23 to 64 - while there is no such gap for the youngest and the oldest age groups. The largest gap is observed for the age group 51-64 years that could be explained by the earlier eligibility of old-age state pension in Siberia. However, the option of early pension could not explain the substantial gap in younger groups. The share of those who are not in labor force in Siberia is larger by 20 percent in the group 23-40 years and by 30 percent in the group 41-50 years compared to Russia as a whole. In 2015, the gap still existed. Table 5 demonstrates that the increase in the LFPR in Siberia was mainly due to the increase in the elderly age group. Some regions demonstrated a remarkable increase in the LFPR in this group, including Tomsk Oblast (from 0.049 to 0.102), the Republic of Tyva (from 0.060 to 0.199).

Of special interest are those who have stopped looking for a job. They are not included to the unemployed and considered to be out of the labor force. However, the investigation of this group is useful to reveal the tightness of the labor market. We present the share of those who do not work, want to work but do not undertake any efforts to find a job (“desperate”) in Table 7. This share is higher in Siberian regions compared to Russia that gave indirect evidence of lower labor demand.

Table 7: The share of “desperate” in population.

(a) 2012					
	15-22	23-40	41-50	51-64	65-72
the Tuva Republic	0.084	0.106	0.065	0.060	0.013
Altai Krai	0.155	0.037	0.028	0.020	0.011
Novosibirsk Oblast	0.041	0.021	0.025	0.017	0.005
Tomsk Oblast	0.079	0.046	0.032	0.047	0.006
Siberian Federal District	0.142	0.050	0.038	0.041	0.013
Russia	0.107	0.033	0.026	0.028	0.009

(b) 2015					
	15-22	23-40	41-50	51-64	65-72
the Tuva Republic	0.095	0.098	0.066	0.068	0.039
Altai Krai	0.149	0.039	0.032	0.034	0.017
Novosibirsk Oblast	0.140	0.039	0.037	0.035	0.014
Tomsk Oblast	0.149	0.055	0.031	0.024	0.003
Siberian Federal District	0.148	0.050	0.038	0.039	0.018
Russia	0.121	0.034	0.025	0.031	0.013

Notes: calculated by authors using the Labor Force Survey data.

For more detailed analysis it is necessary to examine the causes of the job search termination. Fortunately, those who reported of willingness to have a job were asked why they were not looking for the job. Though this question covered only a part of those out of labor force, it still could provide an important information concerning the limitations of the job search. The impossibility to find an appropriate job is the reason for not looking for a job that is named much more frequently in Siberia compared to Russia. People who name this reason want to work but do not make any efforts to find a job because they consider it useless. The share of those who named this reason in the total number of those who stopped looking for a job is presented in Table 9. Remarkably, this share is highest in regions with lowest LFPR.

Table 9: Share of those who named the impossibility to find an appropriate job as a main reason of not searching for the job.

(a) 2012					
	15-22	23-40	41-50	51-64	65-72
the Tuva Republic	0.317	0.383	0.377	0.415	0.000
Altai Krai	0.016	0.205	0.442	0.338	0.000
Novosibirsk Oblast	0.148	0.233	0.434	0.373	0.800
Tomsk Oblast	0.114	0.261	0.500	0.513	1.000
Siberian Federal District	0.078	0.275	0.437	0.352	0.260
Russia	0.062	0.230	0.366	0.345	0.282

(b) 2015					
	15-22	23-40	41-50	51-64	65-72
the Tuva Republic	0.224	0.278	0.415	0.491	0.250
Altai Krai	0.033	0.147	0.397	0.327	0.474
Novosibirsk Oblast	0.029	0.139	0.306	0.323	0.294
Tomsk Oblast	0.053	0.210	0.412	0.550	1.000
Siberian Federal District	0.054	0.245	0.412	0.377	0.324
Russia	0.042	0.183	0.324	0.334	0.332

Notes: calculated by authors using the Labor Force Survey data.

The results of this analysis show that the lower LFPR in Siberia is caused mainly by the higher percentage of people who believe that it is impossible to find an appropriate job.

4 Labor demand

As was shown in the previous section, the negative trends in the Siberian labor market were not accompanied by the decrease in the labor force participation.

Moreover, the labor force participation rate even increased. Thus, the employment decrease was caused by problems that were most probably on the demand side but not on the supply side. To reveal such problems we should investigate the employment structure first. Table 11 presents the Rosstat data on the change in employment by different industries.

Table 11: Change in the number of employed by industries 2014-2015, thousand employees.

	Agriculture	Manufacture	Construction	Wholesale and retail	Service
the Altai Republic	0.7	0.1	0.1	0.3	0.1
the Republic of Buryatia	-0.6	-0.7	-0.5	4.0	-0.1
the Tuva Republic	0.5	-0.4	0.5	0.1	0.1
the Republic of Khakassia	-1.7	-0.6	0.9	-0.4	-0.6
Altai Krai	0.0	-3.5	1.2	2.0	-0.2
Zabaykalsky Krai	-0.2	-0.8	-2.6	0.4	-0.2
Krasnoyarsk Krai	-0.2	0.8	-0.6	-5.5	1.7
Irkutsk Oblast	2.6	5.3	-7.9	7.1	4.8
Kemerovo Oblast	0.9	-10.1	-3.2	-13.4	-1.4
Novosibirsk Oblast	-4.9	-6.0	-4.6	-1.6	-4.0
Omsk Oblast	1.2	-0.5	-0.7	1.0	0.7
Tomsk Oblast	-1.2	-0.8	-7.9	0.9	2.2
Siberian Federal District	-2.9	-17.5	-25.0	-5.3	3.3
Russia	-80.3	-107.9	-92.8	13.4	63.9
	Transport and communications	Education	Healthcare	Other	
the Altai Republic	0.1	0.0	0.0	-0.1	
the Republic of Buryatia	-0.4	-0.1	-0.6	-0.8	
the Tuva Republic	0.1	0.4	-0.2	0.3	
the Republic of Khakassia	-0.8	-0.1	0.4	-0.2	
Altai Krai	1.4	-0.1	0.6	1.0	
Zabaykalsky Krai	-0.1	-0.8	-1.0	-0.1	
Krasnoyarsk Krai	-5.0	1.5	0.3	-4.5	
Irkutsk Oblast	1.7	-1.8	3.5	-5.3	
Kemerovo Oblast	-5.5	-2.4	-2.3	0.4	
Novosibirsk Oblast	1.0	-0.1	-0.3	-0.9	
Omsk Oblast	-0.9	-0.7	-1.5	-1.4	
Tomsk Oblast	-0.9	0.6	-0.1	-1.4	
Siberian Federal District	-9.6	-3.7	-1.3	-13.2	
Russia	12.5	-58.2	-46.2	-86.1	

(Notes: calculated by authors using the Rosstat data.)

In 2015 the overall reduction in the number of employed in Siberia was largely caused by the reduction of personnel in following industries: manufacture, construction, transport and communications, and the group “other industries”. Remarkably, the list of industries that experienced the decline in the number of employed in Russia overall was somewhat different and included agriculture, manufacture, construction, education, health care, and the group “other industries”.

To reveal the industries that largely contributed to the gap between Siberia and Russian average, we calculated an adjusted change in employment. It is the hypothetical change which occurred if the relative change in Siberia was the same as in Russia overall. To find it we multiply the change in employment in particular industry in Russia by the percentage of Siberian employment in Russian employment in this industry:

$$E_{adj} = (E_{R1j} - E_{R0j}) \times \frac{E_{S0j}}{E_{R0j}} \quad (3)$$

where E_{adj} is the adjusted change in employment, j denotes industry, E_{Rtj} is the number of employed in Russia in industry j in year t , E_{Stj} is the number of employed in Siberia in industry j in year t , 0 and 1 denote the years 2014 and 2015.

Then we determine industries that experienced the most substantial employment decline in Siberia compared to Russia. We reveal that there were three industries that mainly caused the more negative employment change in Siberia: construction, transport and communications, and wholesale and retail. The only industry that demonstrated much more positive dynamics in Siberia was agriculture. In manufacture, the employment dynamics in Siberia was close to Russian dynamics.

To investigate the causes of the negative dynamics in the abovementioned industries, it is useful to reveal the regions that mostly contributed to this dynamics. Using aggregate Rosstat data we have found that the Siberian regions that mainly contributed to the employment decline in construction were Tomsk Oblast (a decline by 7.9 thousand employees), Irkutsk Oblast (-7.9), and Novosibirsk Oblast (-4.6). Kemerovo Oblast was the region that most largely contributed to the employment decline in transport and communications (-5.5). The regions that contributed to the decline in wholesale and retail the most were Kemerovo Oblast (-13.4) and Krasnoyarsk Krai (-5.5).

The substantial decline in construction employment was caused by a huge decrease in the construction activity. According to Rosstat data, in 2015 compared to 2014 the construction output decreased by 36.5 percent in Irkutsk Oblast, 14.5 percent in Novosibirsk Oblast, and 6.7 percent in Tomsk Oblast. Remarkably, declines in Irkutsk Oblast and Tomsk Oblast were entirely caused by the output decline in private construction firms.

In contrast, the major employment declines in other industries in the abovementioned regions were not associated with the output decline. There were only

slight reductions in output in transport and communications industries in Kemerovo Oblast. The wholesale and retail sales even increased in Kemerovo Oblast and only slightly declined in Krasnoyarsk Krai.

The more detailed analysis of the labor demand concerns job creation and job destruction. Such analysis requires firm-level data. To obtain such data we use the Ruslana database supported by Bureau van Dijk (BvD). The main sources of the Ruslana database are annual financial reports of firms to government agencies. Ruslana has extensive coverage of Russian firms providing comprehensive information on more than 9 million Russian companies for up to 10 recent years. To evaluate job creation and destruction we followed the approach described by Davis and Haltiwanger (Handbook, 1999). We compared data on the number of employees in firms in 2014 and 2015. If the number of employees decreased in 2015 we counted it as job destruction, if the number of employees increased it was counted as job creation.

The analysis shows that the job destruction was mainly caused by the firms that shut down rather than the firms that contracted. In Irkutsk Oblast, closed firms accounted for 69.0 percent of overall reduction of jobs, while in Tomsk Oblast and Novosibirsk Oblast the corresponding shares were even higher - 71.7 percent and 70.8 percent. The cessation of firms was mainly caused by the decline in industrial construction.

Using Labor Force Survey data, we revealed that the decline in the number of employees in construction sector substantially contributed to the unemployment growth. In 2014-2015 the number of the unemployed having the last job in construction grew by 25.4 percent in Siberia. The share of those who lost their job due to downsizing or closing of firms grew from 26.9 percent to 34.8 percent. These unemployed faced difficulties in the job search as 38.6 percent of them had an unemployment period for more than a year.

Additional information could be obtained by analyzing the dynamics of hiring and dismissing in firms. Such data are provided by Rosstat who collects it only for big and medium enterprises and presents it in aggregated form for the whole country and its regions. Thus, small firms (those with less than 101 employees) and firms operating in the informal sector are not taken into account. As shown in Table 12 during the analyzed period the annual number of dismissals always exceeded the annual number of hires. Such dynamics caused the permanent decline in the number of employed in big and medium firms. The exceeding number of dismissed could go either to small firms or informal sector or become unemployed or inactive.

Overall in Russia there was a permanent decline in the number of hires in 2013-2015 while the number of dismissals decreased more slowly. As a result, the dismissed-to-hired ratio increased from 1.02 to 1.10. In 2016 the number of hires stabilized that led to the reduction in the dismissed-to-hired ratio.

In Siberia, the number of hires and dismissals demonstrated a larger discrepancy. The number of dismissals was higher than the number of hires in the whole federal district and 11 of 12 regions (excluding only small Tuva Republic). The dismissed-to-hired ratio was higher than the average Russian level in 9 of 12

Table 12: Number of hires and dismissals in big and medium enterprises in thousand people.

	2013	2014	2015	2016
<i>Russia</i>				
hired	10127	9713	9097	9140
dismissed	10328	10203	10045	9631
dismissed-to-hired ratio	1.02	1.05	1.10	1.05
<i>Siberian Federal District</i>				
hired	1467	1379	1255	1225
dimissed	1536	1492	1399	1332
dismissed-to-hired ratio	1.05	1.08	1.12	1.09
<i>Novosibirsk Oblast</i>				
hired	211	205	186	181
dimissed	216	214	206	197
dismissed-to-hired ratio	1.03	1.05	1.11	1.09
<i>Kemerovo Oblast</i>				
hired	239	214	187	173
dimissed	260	253	214	200
dismissed-to-hired ratio	1.09	1.18	1.14	1.16

Notes: source: Rosstat data and authors' calculations on Rosstat data.

regions. The decline in the number of hires was larger and unlike overall Russia continued in 2016. The worst situation was observed in Kemerovo Oblast where the number of dismissed exceeded the number of hired by 16 percent in 2016.

The worse dynamics in Siberia was also observed on Rosstat data on vacancies. Rosstat obtains these data by surveying firms. From 2012 to 2016 the number of vacancies declined by 27.9 percent in Siberian Federal District compared to 23.7 percent in Russia. In Novosibirsk Oblast, the number of vacancies declined by 50 percent.

In the whole, the data on hires and dismissals indicated the reduction of labor demand in big and medium firms. In Siberia, this reduction is much larger than overall in Russia. To reveal the causes of the reduction, we apply microdata on firms. Using the abovementioned Ruslana database we collect data on 279,617 companies of Siberian Federal District. This number includes all companies that have data on every year since 2012 to 2016 or every year of its operation period if a company was founded or closed during these years. To provide the comparability with Rosstat data we demonstrate the results only for big and medium enterprises (see Table 13).

Table 13 demonstrates data for all industries and confirms the previous conclusion that the decline in jobs was mainly caused by those firms that shut down. Moreover, the increase of dismissals and the dismissed-to-hired ratio was also caused by the increase in job destruction by ceased firms. The destruction of jobs in the operating firms even decreased during the analyzed period. This

Table 13: Job flows in big and medium enterprises in Siberian Federal District.

	2013	2014	2015	2016
Job creation	112,390	98,902	106,503	120,137
by existing firms	91,785	62,596	66,073	59,299
by new firms	20,605	36,306	40,430	60,838
Job destruction	128,468	198,935	183,708	141,824
by operating firms	63,631	45,579	56,632	39,300
by ceased firms	64,837	153,356	127,076	102,524

Notes: calculated by authors using the Bureau van Dijk Ruslana data.

result indicates that firms in Siberia do not usually apply a reduction in the number of employees responding to the crisis. This result is in line with the Russian labor market model mentioned in the introduction.

The decrease in the labor demand was caused by the firms that exit the market. The analyzing period is characterized by the growth in financial instability in firms. According to the Department of Accounting Regulation, Financial Reporting and Auditing of the Ministry of Finance of the Russian Federation, the total share of audit reports with a modified opinion on the accounting (financial) statements issued in 2016 was 23.3 percent. This shows that a “true and fair” view of a company's financial performance and position is not always presented by audited companies. In addition, according to the requirements of international and Russian legislation, the audit report may contain an emphasis of matter drawing attention to specific matters presented or disclosed in the financial statements that, in the auditor's judgment, are of such importance that it is fundamental to users' understanding of the financial statements (for example, the uncertainty caused by outstanding legal proceedings). In 2016, 4.2 percent of audit reports emphasized a material degree of uncertainty that may cast significant doubt on the entity's ability to continue as a going concern. In addition, it can be noted that this indicator has been increasing over the past three years, which is by no means a positive development. Although the audit report expressing doubts on the entity's ability to continue as a going concern in the foreseeable future should not be interpreted as the auditor's statement about the impending bankruptcy of the business, E. Carson and his co-authors note that

prior studies consistently find a positive and statistically significant relationship between opinions modified for going-concern uncertainty and the incidence of future bankruptcy [6].

However, even an unmodified opinion cannot guarantee to the user of financial statements that they are presented fairly. The auditor is responsible for expressing an opinion indicating that reasonable, not absolute assurance has been obtained that the financial statements are free from material misstatement.

The current situation in audit is characterized by a crisis of trust of users of financial statements, which developed due to a number of scandals involving well-known audit firms. Most cases are connected with issuing audit reports with unmodified opinion on the reporting with material misstatements. Therefore, it can be argued that the percentage of financial statements containing material misstatement is significantly higher than 23.3 percent. And the number of organizations with a material degree of uncertainty on the entity's ability to continue as a going concern in the foreseeable future (12 months) is much bigger.

What is the reason for this situation? There is no single answer to this question. However, according to the authors, management and personnel-related risks have the greatest impact on the company's financial position and its fair presentation in the financial statements.

Most established companies spend huge amounts of money and time (up to 10 percent) on training their employees, providing bonuses for them and consider these costs not as expenditure items, but as high-yield investment. But such investment is at the same time high-risk as personnel have an exceptional opportunity to choose their employers.

The managers and employees in the financial and analytical sector are the most valuable and qualified specialists. Often, these two positions overlap, and a finance specialist can simultaneously be a manager (for example, a Finance Department Manager). This raises the topical issue of management risks.

Management risk is the manager's assumed responsibility for the implementation of the management decision without full assurance (guarantee) in the final positive result. Complex promising solutions are often associated with risk. The self-confidence of the manager, ability to convince play a crucial role in making and implementing bold decisions with reasonable risk.

The factors of management risk include: competence, professionalism, willingness to take risks, time pressure, coordination of the management team (internal factors); and the characteristics of the external environment (external factors): the availability of relevant information, permanence, external pressure.

Management risk has a direct impact on the financial performance of the organization. Other internal risks depend on the strategy chosen by the manager, the decisions made. The influence of internal risks on the financial result interacts with management risk. Management risk may also include investment risk factors: the risk of choosing a source of financing, the risk of loss of profit.

5 Conclusion

This article examines the causes of the substantial decrease in employment in Siberia. We investigated the roles of labor supply and labor demand in this reduction. Our analysis revealed that the main causes of the reduction are connected with labor demand rather than labor supply.

Besides labor demand and labor supply, we mentioned the third possible cause namely the government regulation of labor market. Now we discuss its possible role briefly. During 2012-2016, the increases in the national minimum

wage were minor. From January 2012 to January 2016 it increased by 34.5 percent in nominal currency while in real terms it decreased by 5.7 percent. Only in July 2016 there was a substantial increase in the national minimum wage by 20.9 percent, but it occurred only at the end of the analyzing period so it could not explain the permanent negative dynamics. The Russian regions also could establish regional minimum wages that must be higher than the national minimum wage. However, the regional minimum wages in Siberian regions were low especially in comparison with regions in neighboring Ural and Far East federal districts. These regional minimum wages also did not experience any substantial increases in the analyzed period. There were also no substantial changes in the legal regulation of labor market or changes in tax policy that could affect the labor market behavior. Thus, we conclude that the government regulation could not play a major role in labor market dynamics.

We show that the reduction in the number of employees is caused by the job destruction in ceased firms and the number of destroyed jobs has increased substantially. In our opinion, these processes are caused mainly by the financial instability which in turn is caused by management risks.

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