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Vocational Education in the System of Determinants of Reducing Youth Unemployment: Interregional Comparisons

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Abstract

The purpose of our research is to perform an empirical analysis of the factors affecting the reduction of youth unemployment in Russian regions and to assess the role of education. For statistical estimations we used regression models. The results of our study show that the rate of youth unemployment is influenced by the rate and structure of employment, the level of economic development of the region and the demographic structure of the region. We also found that vocational education reduces the risks of youth unemployment in Russian regions.

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1. Introduction

The high rate of youth unemployment in the regions of Russia, caused by both endogenous and exogenous factors, is one of the challenges of today hindering the modernization of the economy. Leading to greater social tension, the high rate of youth unemployment is a feature of not only Russian regions, but is observed in European countries as well. In a number of papers authors investigate the causes and factors of high unemployment rate and its duration across countries (Blanchard & Diamond, 1994; Machin & Manning, 1999). Some authors (Bean, 1994;

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Layard, Nickell & Jackman, 1991; Boeri & Terrell, 2002) believe that the qualifications and skills of people who stay out of job for a long time do not meet the requirements of new jobs.

It is important to take into account the factors on both the demand side and the supply side. On the one hand, the rate and structure of youth unemployment in Russian regions reflect the problems existing in the economy, its poor diversification limiting employment opportunities for graduates of universities and colleges. On the other hand, young people often have no opportunity to get vocational education because of the low income or lack of an adequate educational infrastructure in their region, and this also produces a considerable impact on the youth labor market. In the regions of Russia a significant part of the unemployed (44%) are those who do not have professional education, of which 32.8% have secondary (complete) general education, 10.1% - basic general education and 1.1% do not have basic general education, 16.4% have higher vocational education, 19.3% have secondary vocational education, 20.3% - basic vocational education (Trud i Zanatost v Rossii, 2013). It is important to bear in mind that the regional labor markets are heterogeneous, and that the rate of youth unemployment is influenced by specific regional factors. The currently existing interregional differences in the rate of youth unemployment are largely determined by the level of economic development of the region, the demographic structure of the population and the share of young people, the structure of jobs, and the availability of vocational education for young people.

The purpose of this study is to perform an empirical analysis of the factors affecting the reduction of youth unemployment in the regions of Russia, and to assess the impact of vocational education on the reduction of youth unemployment.

To do this, we perform the following research tasks:
- generate a typology of the Russian regions by the rate of youth unemployment;
- characterize the typological groups using the economic, demographic and social parameters;
- perform correlation and regression analyses of the baseline variables explaining the existing rate of youth unemployment in the different typological groups;
- make interregional comparisons and compare the impact of vocational education on the reduction of youth unemployment in each typological group.

We identified the most significant factors reducing youth unemployment in the regions of different types, and the impact of vocational education on the reduction of unemployment.

The object of our study is the unemployed aged 20-29 years with different levels of education. The research methods include regression models and factor analysis. The paper is organized as follows. In the second section we perform cluster analysis of the Russian regions by the rate of youth unemployment and characterize the selected groups. Assessing the regression models, in the third section we identify the factors affecting the reduction and growth of the rate of youth unemployment. The regression analysis is performed for all groups of regions separately and for Russia as a whole. Our findings and recommendations are presented in the summary section.

2. Methodology

2.1. Cluster analysis of the Russian regions

The Russian labour market is characterized by the high heterogeneity. We used cluster analysis to create relatively homogeneous groups of regions. The classification of the regions of Russia by the rate of unemployment among the young people aged 20-29 years is based on the data obtained from Federal State Statistics Service of the Russian Federation (Rosstat). In order to carry out a comparative analysis, we have calculated the average rate of unemployment for the age group 20-29 years in Russia. The regions are ranked by the degree to which their rates of youth unemployment differ from the Russian average (Rusanovskiy, Blinova & Bylina, 2014). The results are shown in Table 1.

Table 1. Russian regions classified by the rate of unemployment among the 20-29-year olds

No	Number of regions	Unemployment rate, %	Group members
1	3	more than 18.0	The Republics of Dagestan, Tyva, Chechnya
2	21	from 10.8	The Republics of Altai, Kabardino-Balkaria, Kalmikia, Karachayevo-Cherkesia, Sakha (Yakutia),

		to 18.0	North Osetia-Alania, Khakassia. Districts: Trans-Baikal, Kamchatka, Primorye. Oblasts: Astrakhan, Irkutsk, Kemerovo, Kurgan, Murmansk, Omsk, Sakhalin, Tomsk, Chelyabinsk. The Jewish Autonomous District, the Nenets Autonomous District
3	7	from 9.9 to 10.7	The Republics of Adigeya, Bashkortostan, Komi. The Altai District. Oblasts: Kaliningrad, Kirov, Pskov
4	19	from 8.1 to 9.8	The Republics of Buryatia, Karelia, Mari-El, Chuvash. Districts: Krasnodar, Perm, Stavropol, Khabarovsk. Oblasts: Arkhangelsk, Volgograd, Voronezh, Kursk, Orenburg, Oryol, Rostov, Smolensk, Tambov, Tver, Ulyanovsk. The Khanti-Mansi Autonomous District
5	12	from 7.1 to 8.0	The Udmurt Republic. Oblasts: Amursk, Bryansk, Vologda, Ivanovo, Lipetsk, Moscow, Novosibirsk, Penza, Saratov, Sverdlovsk, Tyumen
6	17	from 5.1 to 7.0	The Republics of Mordovia, Tatarstan. The Krasnoyarsk District. Oblasts: Belgorod, Vladimir, Kaluga, Kostroma, Leningrad, Magadan, Nizhniy Novgorod, Novgorod, Ryazan, Samara, Tula, Yaroslavl. The Chukchi and Yamalo-Nenets Autonomous Districts

The first classification group includes 3 regions where the rate of youth unemployment exceeds the Russian average more than twice. The second group is comprised of 21 regions with the rate of youth unemployment more than 20% higher than the Russian average. In the 8 regions of the third group the rate of youth unemployment is 11%-20% higher than the Russian average. The rate of youth unemployment in the 19 regions of the fourth group is close to the Russian average (±10%). The fifth group consists of 12 regions having the youth unemployment rate 11%-20% lower than the Russian average. Finally, in the 16 regions belonging to the sixth group the rate of unemployment among the representatives of the age group under study is more than 20% lower than the Russian average. The results of our classification are interpreted by comparing the cluster profiles of the typological groups against each other and the factors determining the rate of youth unemployment.

We made estimates of the regression equations, which included four groups of indicators – social, demographic, economic and educational, which in a summarised form reflect the situation in the region. To approximate the factors we used the following indicators and variables available in the statistical database. To approximate the demographic factors, we used such indicators as the share of those younger than the working age (X_2) and the share of the 20-29-year olds (X_1) in the population. To approximate the economic factors, we used the gross regional product (GRP) per capita (K_1), characterizing the level of economic development of the region, as well as the average wage (W_1) and the share of the employed in manufacturing industries (Z_3), reflecting the structure of employment in the region. The social factors were represented by such indicators as the employment rate (N_1), share of households having access to the Internet (H_1). To approximate the educational factors, we used the share of population with higher (F_1), secondary (F_2) and basic vocational education (F_3), the share of population with secondary (complete) general education (F_4), the share of population with basic general education (F_5), and the share of population without the basic general education (F_6).

In order to identify the dominating factors we have performed the regression analysis within our typological groups and constructed dependencies between the rate of youth unemployment and the indicators under study. The sources of the data we use are the official publications of the Federal State Statistics Service of Russia (Trud i Zanatost v Rossii, 2013; Regioni Rossii. Socialno-Economicheskie pokazately, 2013), and the official website of Rosstat (Oficialnyi Website Federalnoi sluzby gosudarstvennoy statistiki). All the initial data has been normalized and centered in a standard way.

2.2. Characteristics of the groups of Russian regions

Table 2 shows the social-economic characteristics of the typological groups.

Table 2. Main social-economic indicators and group averages

Indicator \ Group	1	2	3	4	5	6
Total unemployment rate, % (U_2)	20,0	8,3	6,7	5,8	5,2	4,2
Employment rate, % (N_1)	50,6	62,0	62,5	63,6	65,1	68,1
Share of the 20-29-year olds in the population, % (X_1)	18,5	16,7	15,6	15,9	15,9	15,5
Share of those younger than the working	31,1	19,5	16,9	16,8	16,7	16,2

age, % (X_2)						
Share of the employed in manufacturing industries (Z_3)	5,3	11,1	14,3	14,8	16,7	17,0
Gross regional product (GRP) per capita, RUR (K_1)	93615,2	221595	193883,5	201300,3	241054,6	268244,2
Average wage, RUR (W_1)	17761,0	26667,9	20351,5	22019,2	23868,10	27599,8
Share of households having access to the Internet, % (H_1)	19,3	50,4	52,7	52,0	52,9	53,2

Table 2 shows that the values of such parameters as "share of those younger than the working age" and "share of the 20-29-year olds in the population" decrease from the first to the sixth group, demonstrating a close inverse relationship with the rate of youth unemployment. In the regions experiencing demographic pressure on the labor market, the unemployment rate is higher. At the same time, the values of such parameters as "gross regional product (GRP) per capita", "employment rate", "share of the employed in manufacturing industries", "average wage" and "share of households having access to the Internet" increase from the first to the sixth group, correlating positively with the rate of youth unemployment.

Typological grouping of the regions of RF by the rate of youth unemployment is not only of academic interest, allowing to identify the types of a latent nature, but is of a certain practical sense as well, as it enables to differentiate among the approaches to choosing and implementing regional youth unemployment reduction strategies.

The results of the study presented in Table 3 highlight the relationship between education and unemployment.

Table 3. The number of people with different levels of education by groups of regions (group average), per 1000 population

Group Level of education	1	2	3	4	5	6
Higher vocational education (F_1)	149	200	193	198	208	213
Secondary vocational education (F_2)	211	318	320	318	318	329
Basic vocational education (F_3)	52	54	70	63	62	57
Secondary (complete) general education (F_4)	300	190	184	189	184	184
Basic general education (F_5)	163	127	123	122	118	111
Without basic general education (F_6)	76	62	68	66	65	61

The number of people with higher, secondary and basic vocational education in the fifth and the sixth groups, having relatively low rates of youth and overall unemployment, is much higher than in the first group of regions, where unemployment is the highest. At the same time, the number of people with secondary and basic general education, as well as the number of those who do not have basic general education, is the highest in the regions belonging to the first group. We agree with the authors who emphasize the importance of vocational education in the system of factors reducing youth unemployment (Gregory and Collier, 1988; Grogan and Van den Berg, 1999).

It should be noted that in this study we make a distinction between the direct causes of unemployment and the factors (social, economic, demographic) that increase (reduce) the risks of youth unemployment.

3. Results and discussion

In this section we discuss the impact of economic, demographic and social factors on the dynamics of unemployment among the young people aged 20-29 years by constructing regression models. The impact of education on the rate of youth unemployment across the regions was assessed along with the impact of economic, demographic and social factors, which were compared against each other. Models were built for Russia as a whole and for the individual groups of Russian regions. The results of calculating the dependence of the youth unemployment rate on the selected factors for Russia as a whole are shown in Table 4.

Table 4. Statistical parameters of the model for Russia as a whole ($R^2 = 0,721$)

Variable	Coefficient	Std. Error	t-Statistic	Sig.

Constant	0,000	0,06	0	1
N_1	-0,461	0,079	-5,809	0
X_2	0,355	0,078	4,528	0
F_2	-0,176	0,084	-2,099	0,039

According to the resulting dependence, the rate of employment in the region has the greatest impact on the rate of youth unemployment in Russia. The creation of new jobs with decent working conditions and the diversification of the structure of employment expand the range of employment opportunities for the young people and help reduce the unemployment rate. The important factor affecting the rate of youth unemployment is the share of young people in the total population and its dynamics. Our results are in line with the findings of other authors. The existence of a positive relationship between the share of young people in the population structure and the youth unemployment rate is proved in Bertola, Blau and Kahn (2002). Jimeno and Rodriguez-Palenzuela (2003) also find that the impact of the share of young people in the population structure on the rate of youth unemployment is positive and statistically significant. The impact of the demographic factors on the interregional differences in context of the youth unemployment rate is discussed in Korenman and Neumark (2000), and a positive relationship is also revealed. However, some authors argue that the relationship is negative, so that the greater the share of young people in the total population, the lower the unemployment rate. In Russia, the total number of young people aged 25-29 years between 2002 and 2012 grew by 18.3%, while employment in this group increased by just 3.9%. This gap cannot be explained only by the desire of young people to continue their education and the delay in entering the labor market as a result. The risk of demographic pressure on the labor market increases when the market for educational services is underdeveloped. According to the economic theory, the level of education plays an important role in the employment of young people, since investments in human capital increase the young people's competitive advantages on the labor market. In the model this parameter is represented by the number of population with secondary vocational education (people per 1000 population). Our estimations show that the growth of the number of those having secondary vocational education affects the reduction of youth unemployment. The interaction of the demographic situation and the institution of education produces different regional effects. In the event that the share of young people with vocational education is high, the effect of rising unemployment may not manifest itself. According to Shimer (2001), this is due to the fact that a large share of young people in the population may actually help reduce unemployment by reducing the employer's costs of finding employees. The growth of a company depends on the employer's ability to get professionally trained employees. Regression models assessing the impact of economic, demographic and social factors on the rate of youth unemployment are built for each (except the first) classification group of Russian regions. According to the classification, the first group, where the youth unemployment rate is the highest, consists of only three regions: the Republic of Dagestan, the Republic of Tyva and the Chechen Republic, and building significant models for such a small number of objects is hardly possible.

The classification of the Russian regions into the selected typological groups determines the behavior of labor market indicators. Youth unemployment in this case is the function of key characteristics of the regional labor market and the region as a whole. Each region offers different opportunities and puts different constraints in terms of youth employment and vocational education.

The second group includes 21 regions and has high rates of both overall and youth unemployment. The rate of youth unemployment in the regions of the second group varies from 10.8% to 18.0%. The results of our regression analysis of the dependence of the youth unemployment rate from the selected factors for the second group of regions are shown in Table 5.

Table 5. Statistical parameters of the model for the second group of regions ($R^2 = 0,683$)

Variable	Coefficient	Std. Error	t-Statistic	Sig.
Constant	0,210	0,036	5,907	0,000
F_2	-0,170	0,044	-3,887	0,001

X_2	0,148	0,049	3,016	0,007

The resulting regression dependence establishes a positive relationship between the rate of youth unemployment and the demographic structure of the population (the share of population younger than the working age), and a negative relationship between the rate of youth unemployment and the number of people with secondary vocational education.

The third group is quite small and consists of just 7 regions with the rate of unemployment among the people aged 20-29 years 11%-20% higher than the Russian average. The results of our regression analysis for the third group of regions are presented in Table 6.

Table 6. Statistical parameters of the model for the third group of regions ($R^2 = 0,730$)

Variable	Coefficient	Std. Error	t-Statistic	Sig.
Constant	-0,049	0,008	-5,984	0,002
F_2	-0,107	0,029	-3,647	0,015
F_4	0,123	0,035	3,528	0,017

The resulting regression dependence establishes a negative relationship between the rate of youth unemployment and the number of people with secondary vocational education, and a positive relationship between the rate of youth unemployment and the number of people with secondary general education. These results are consistent with the empirical findings of other authors. Most of them note that the unemployed having vocational education are more likely to get employed (Grogan & Van den Berg, 1999). The latter relationship is explained by the fact that the labor market is entered by a large number of young people, who have just finished secondary comprehensive school and have neither special education, nor work experience, which makes them less employable. At the same time, the growth of the number of people with secondary special education reduces the rate of youth unemployment in the regions of the group.

The fourth group is comprised of 19 regions, where the situation on the youth labor market is similar to the average situation in Russia, and the rate of employment is slightly lower than the Russian average rate. The results of the regression analysis for the fourth group of Russian regions are shown in Table 7.

Table 7. Statistical parameters of the model for the fourth group of regions ($R^2 = 0,777$)

Variable	Coefficient	Std. Error	t-Statistic	Sig.
Constant	-0,225	0,010	-21,811	0,000
F_6	0,072	0,016	4,616	0,000
K_1	-0,008	0,003	-3,072	0,008

In this model the rate of youth unemployment positively correlates with the number of people having no basic general education. According to the model this means that the growth of unskilled labor of low competitiveness on the regional labor markets causes the rate of youth unemployment to increase. The resulting model indicates that the level of regional economic development in the fourth group has a negative sign, because together with the growth of gross regional product per capita, the rate of youth unemployment decreases.

The fifth group embraces 12 regions of RF with the rate of unemployment in the age group 20-29 years lower than the Russian average. The results of the regression analysis for the fifth group of Russian regions are presented in Table 8.

Table 8. Statistical parameters of the model for the fifth group of regions ($R^2 = 0,800$)

Variable	Coefficient	Std. Error	t-Statistic	Sig.
Constant	-0,357	0,006	-57,403	0,000
F_5	0,033	0,009	3,776	0,005

The results show that in the regions of the fifth group the significant factor is the number of people with the basic general education (people per 1000 population). Its growth leads to an increase in the rate of youth unemployment. The sixth group includes 17 regions with the lowest youth unemployment rates. The results of the regression analysis for the sixth group of Russian regions are shown in Table 9.

Table 9. Statistical parameters of the model for the sixth group of regions ($R^2 = 0,816$)

Variable	Coefficient	Std. Error	t-Statistic	Sig.
Constant	-0,490	0,022	-21,879	0,000
F_6	0,125	0,027	4,672	0,001
Z_3	-0,069	0,020	-3,460	0,007

This model determines the dependence of the rate of unemployment in the age range of 20-29 years in the regions of the sixth group from the following factors: the share of those employed in manufacturing industries (the correlation is negative) and the number of population having no basic general education (the correlation is positive). The share of the manufacturing sector in the economies of the regions of the sixth group is higher than in other groups, and the growth of the share of the employed in this kind of economic activity helps reduce the rate of youth unemployment. Those who do not have basic general education tend to join the ranks of unskilled labor with low competitiveness on the labor market, which contributes to the growth of youth unemployment.

Thus, our empirical study enabled us to identify the factors reducing youth unemployment in the age group 20-29 years in Russia as a whole and in the selected regions of different types. The results of our study show that the high level of vocational education is a competitive advantage on the labor market. The growth of the number of people with higher and secondary vocational education reduces the rate of youth unemployment, while the growth of the number of poorly educated people increases the unemployment rate. For instance, in the regions of the second and third groups, where the rate of youth unemployment varies from 9.9% to 18.0%, the growth of the number of people with secondary vocational education reduces youth unemployment, while the growth of the number of those who have secondary (complete) general education contributes to its increase. In the regions of the fourth, fifth and sixth groups with the rate of youth unemployment, ranging from 5.1% to 8.1%, the growth of the number of population with basic general education and the number of those not having basic education leads to an increase in youth unemployment. The resulting models that link the rate of youth unemployment with social, economic and demographic characteristics of the Russian regions can be used in the development and implementation of the targeted regional strategies aimed at reducing the youth unemployment rate. The interregional differences manifest themselves in (1) the different sets of factors for the regions of different types and (2) the degree of sensitivity of the regions of different types to the factors and determinants of youth unemployment.

4. Conclusion

The goal of this study was to assess the impact of specific regional factors, including vocational education, on the rate of youth unemployment in the Russian regions of different types. We assessed the regression models that included demographic, economic and social explanatory variables. Discussing the factors contributing to the reduction of youth unemployment, we paid particular attention to the level of vocational education of young people. We found that the risk of becoming unemployed is higher for those who are poorly educated or have no education at all. We also arrived at the conclusion that the public employment policy measures, aimed at reducing youth unemployment, should be regionally differentiated. Our typological analysis enabled us to understand the spatial

specificities of youth unemployment and assess the impact of demographic, economic and social factors on the reduction of the unemployment rate in the classification groups of the Russian regions. Comparing the typological groups with the social, economic and demographic characteristics of the regions of Russia, we managed to identify the specific features of the relationship between the rate of youth unemployment and the key characteristics of the regions, the structure of employment, the level of vocational education, and the demographic structure of the population. As a result, we identified the most significant factors affecting the reduction of youth unemployment that should not be ignored when developing regional strategies for social-economic development and regional employment programs. We did not do estimations for the first classification group where the rate of youth unemployment is the highest due to the small number of regions it contains. For the regions of the second and third groups the most significant factors affecting the reduction of youth unemployment are the growth of the number of people with secondary vocational education, and the reduction of the number of those having secondary (general) education on the labor market. The growth of the share of young people in the population structure puts a demographic pressure on the labor market, which is mitigated by the higher level of vocational education of the young people. In the regions of the fourth, fifth and sixth groups the growth of the rate of youth unemployment is fueled by the low level or complete lack of (basic) education of the population. The growth of the number of people with secondary vocational education, the improvement of the level of economic development of the region, and the increase of the share of the employed in the manufacturing sector help reduce the rate of youth unemployment. Our results show that the graduates of secondary schools, not wishing to continue their education join the ranks of the unemployed increasing the youth unemployment rate as a result.

Our findings prove (1) the existence of a relationship between the rate of youth unemployment and the social-economic and demographic characteristics of the region, (2) the importance of applying a regionally differentiated approach to implementing the key areas of the employment policy, aimed at reducing the rate of unemployment, including youth unemployment, and (3) that vocational education plays an important role in reducing youth unemployment. This study is of practical importance, as it enables to identify the factors contributing to the reduction of youth unemployment in regions of certain types.

Acknowledgements

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