Employment of Vocational Graduates: Still a Slough or Already a Ford?

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Received in May 2018

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Abstract. The study is devoted to employment of recent vocational graduates. The proportion of middle-school graduates in vocational enrollment has increased essentially over the past decade, which indicates that the choice of vocational trajectories, on average, is now made at lower age. It was established based on the Monitoring of Education Markets and Organizations that on average 44 percent of students combined work and study in 2010–2015. Vocational students mostly combine work and study because of financial constraints, their employment rarely being related to their field of study. Later on, when making a transition from education to the labor market, vocational graduates have to accept one of the first job offers as they cannot afford a longer job search. The second part of the study draws upon the findings from the 2010–2015 sampling survey of graduate employment administered by the Federal State Statistics Service (Rosstat). It is shown that combining work and study has positive effects on employability of graduates as well as on the size of their starting salaries. In addition, self-funded students and those who combine study with major-related work are more likely to get employed in their field of study after graduation. Education-job mismatch among graduates is found to entail income "penalties".

Keywords: vocational education and training, study-to-work transition, labor market, starting salary, combining work and study.

DOI: 10.17323/1814-9545-2019-1-109-136

Employment after graduation from vocational schools is a critical time in the life of young people when they acquire a new socioeconomic status. Study-to-work transition may be considered successful when a fresh graduate gets a job corresponding to their qualifications and skills and is satisfied with the working conditions, work schedule, sal-

The study was sponsored by the HSE Basic Research Program.
Translated from Russian by I. Zhuchkova.

ary, job security, and opportunities for career growth and creative self-expression [Roshchin 2006].

Russia is anticipating a birth rate decline, which is expected to cause a steep decrease in working age population in the ten to fifteen years to come[1] and lends a specific urgency to the problem of employment of vocational graduates. As the flow of youth into the labor market is shrinking, the cost of mistake in study-to-work transition is rising, the early career stage playing a great role in career development and future earnings [Robst 2007; Zhang 2008]. Besides, recent graduates are much more vulnerable in the labor market than older workers as a result of lacking work experience, having little idea of the labor market mechanisms, and being less protected against dismissal in a volatile economy [Ryan 2001; Rudakov 2015]—all of which contributes to the urgency of the problem of vocational graduate employment.

Education-occupation mismatch has negative effects not only for graduates but also for society as a whole. Research shows that graduates who fail to find a job matching their field of study tend to earn less and underuse their competencies [Gimpelson et al. 2009; Nordin, Persson, Rooth 2010]. Therefore, successful transition of students and graduates to the labor market has been traditionally regarded as a key indicator of efficiency of any professional education system, vocational training being no exception. Analysis of vocational graduate employment data allows assessing the efficiency of education policy in workforce training. Employment statistics are considered to be one of the indicators of how well vocational education systems meet labor market demands[2].

A system for monitoring the quality of workforce training was created in 2015 in Russia under the Measures to Develop Vocational Education and Training Initiative[3]. Statistics on employment, salaries and distribution of vocational graduates among the federal subjects of Russia are supplied by the Pension Fund of the Russian Federation. Collecting high-quality raw data and working to ensure its validity and reliability are important but not the only prerequisites for effective managerial decisions concerning employment of vocational graduates. We believe that of no less importance to the development of pol-

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[1] Russian Federal State Statistics Service (Rosstat). Population Projections for the Period of up to 2035. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/population/demography/#

[2] Education Development for 2013–2020, a national program of the Russian Federation, envisaged a 60-percent increase in the proportion of last-year vocational graduates employed in their field of study by 2020. https://минобрнауки.рф/проекты/438/файл/3039/Государственная%20программа%20Российской%20Федерации.pdf

[3] Measures to Enhance the System of Vocational Education and Training in 2015–2020, approved by the Order of the Government of the Russian Federation No. 349-r of March 3, 2015. Available at: http://asi.ru/upload/iblock/61e/cWukCnDBv5U.pdf

icies in this domain is understanding the context-related factors that can either foster successful employment and high earnings of vocational graduates or, alternatively, reduce their competitive edge in the labor market and increase the risk of winding up unemployed.

This paper seeks to examine how employment of vocational graduates is affected by their sociodemographic characteristics and specific aspects of their student life, namely:

- How combining work and study is related to success in vocational graduate employment, in particular to the match or mismatch between education and job;
- To what extent education-job mismatch affects vocational graduates' income;
- Whether self-funding of education affects the size of future salary.

Analysis of transition between the education system and the labor market requires understanding the background behind the specific study-to-work trajectory of vocational students. For this reason, the first part of the article focuses on the conditions that shape the choice of vocational trajectories and the motives for such choice. The second part of the article is dedicated to an analysis of the transition from vocational education to the labor market.

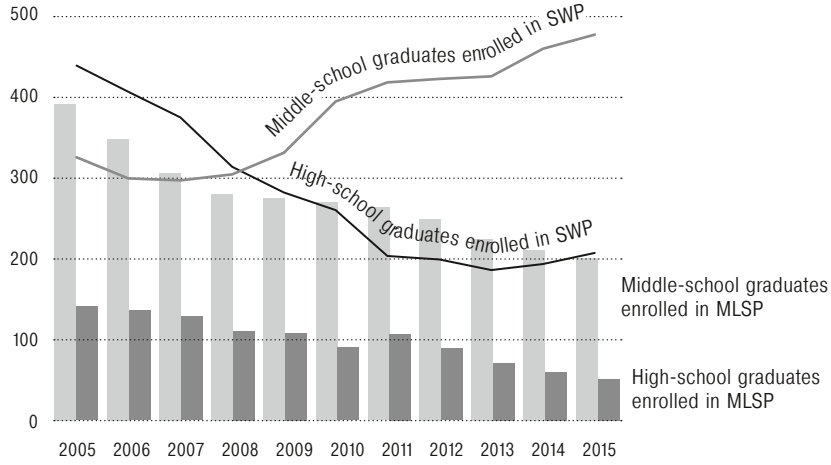
Empirical basis for the first stage of the study included official statistics and data from sociological surveys conducted under the Monitoring of Education Markets and Organizations (MEMO)[4]. The MEMO was designed to supply public authorities with information necessary to make policy decisions in education; it has been administered annually since 2002 by the Higher School of Economics under the aegis of the Ministry of Education and Science of the Russian Federation. The MEMO was selected to be the source of data for analysis because the sociological surveys within its structure include items on choice motivations, preferences and strategies of education market participants. In addition, the MEMO provides information on the socioeconomic characteristics of respondents' families. Having this data at hand makes it possible to analyze the specific characteristics of vocational students and the broad contexts of their decision-making processes, allowing for correct interpretation of their post-graduation employment patterns. Findings from 2010–2015 vocational student surveys, with around 1,800 respondents yearly, were used in this analysis.

As for the second part of the study, its empirical basis is represented by the National Statistical Sampling Survey of Graduate Employment administered by Rosstat[5]. The survey was carried out from April

[4] For more details on the methodology and questionnaires, visit https://memo.hse.ru/met

[5] http://www.gks.ru/free_doc/new_site/population/trud/itog_trudoustr/index.html

Figure 1. **Vocational Enrollment in Mid-Level Specialist Programs (MLSP) and Skilled-Worker Programs (SWP)**(1,000 students)



Source: Rosstat.

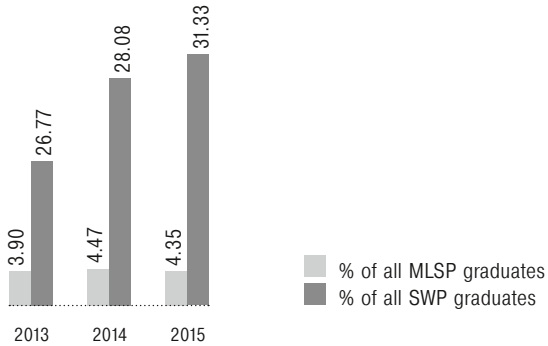
to September 2016 on a sample of 36,000 respondents (0.3 percent of all graduates in higher and vocational education, including former basic vocational training). The estimates obtained were extrapolated to the general population with the same characteristics. The survey is built around the statistics on job search and placements among graduates, including respondents' current position in the labor market.

The Background of Study-to-Work Transition among Vocational Graduates

The average age of vocational students has been declining rapidly over the past decade. Since the Unified State Examination (USE) was introduced, high school has become more selective [Dudyrev, Shabalin 2015]. As a result, more and more middle school graduates opt for vocational schools, where they obtain general secondary education in addition to learning trade-specific skills. Figure 1 illustrates how rapidly the age structure of vocational students became younger in 2005–2015: the proportion of middle school graduates in vocational enrollment increased by one third to make 75 percent by the end of the decade. This tendency manifests itself most prominently among students enrolled in mid-level specialist programs (MLSP)[6], the best part

[6] Federal Law No. 273-FZ On Education in the Russian Federation of December 29, 2012 merged the levels of initial and secondary vocational education and training, vocational programs being divided into skilled-worker programs (SWP) and mid-level specialist programs (MLSP). Due to differences in the levels of competencies and socioeconomic characteristics among students enrolled in these two basic types of vocational programs, they will

Figure 2. **The Proportion of Vocational Graduates Enrolling in College the Same Year They Graduate from Vocational Schools**



Sources: Rosstat, Ministry of Education and Science of the Russian Federation. Forms for Federal Statistical Monitoring in Higher Professional Education

of whom today are graduates from middle school—not high school, as it used to be.

One of the reasons behind this change is that students choosing vocational training are normally less academically successful than their peers at secondary school. Research shows that students intending to proceed to high school have an average math score of 566 in TIMSS, as compared to only 500 among prospective vocational students [Bessudnov, Malik 2016].

Most middle-school graduates who opt for vocational training would hardly have their USE scores accepted by colleges. With a certificate of vocational education, however, those young people obtain access to higher education. Colleges with low admission requirements are ready to accept MLSP and SWP graduates, who do not even have to take the USE. As we can see, the motives for opting for vocational training have changed. Formerly, vocational schools were regarded as educational institutions that provided quick access to the labor market; today, however, vocational education is often used as a transition stage, the "springboard" for college. According to MEMO data, in 2010–2015 on average 37 percent of MLSP students and 60 percent of SWP students reported planning to enroll in college as soon as they finished vocational studies. According to Rosstat statistics, the percentage that actually makes direct transition from vocational school to college is somewhat lower but still significant (Fig. 2).

Lower average performance of vocational students as compared to high-school students is largely due to the effects of socioeconomic inequality. Findings show that parental education and socioeconom-

be analyzed not only jointly as a single category but also separately as subcategories.

ic status are important predictors of student achievement [Sirin 2005; Ermisch, Pronzato 2010]. Vocational students usually come from lower-educated and poorer backgrounds than their high-school and college peers. In the course of MEMO sociological surveys, only 10.7 percent of MLSP and 23 percent of SWP students reported that their father (step father) had a college degree, as compared to the rate of 43.4 percent among college students[7]. A similar distribution is observed in students' responses about mother (step mother)'s education: 18.7% in MLSP, 31% in SWP, and 53.7% in college. The MEMO data also reveals lower incomes in vocational students' households. About 34 percent of MLSP students report having spent their school years in families classified under the three least advantaged respondent groups (Fig. 3). The proportion is slightly lower among SWP students but still accounts for no less than 25 percent. As for higher education, only 16 percent of college students were raised in families that could not always afford to buy clothes or food.

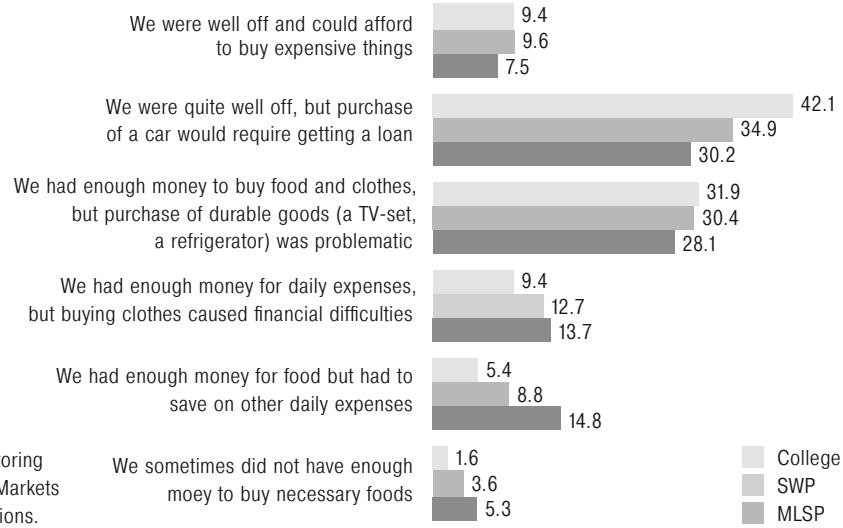
As vocational students largely come from relatively low-income families, they often look for a job which can help to overcome their financial constraints. According to MEMO findings, on average 44 percent of vocational students combined work and study in 2010–2015. However, salaried jobs of MLSP and SWP students were in most cases not related with their field of study (Fig. 4). Combining work and study is slightly more common—55.3 percent on average—among college students, who are older and thus have better chances for employment.

College students are often ready to work for less wages or even for free, provided that the job allows them to develop professional competencies relevant to their future profession [Apokin, Yudkevich 2008]. Such students are primarily motivated by gaining work experience that will later be appreciated by employers [Roshchin, Rudakov 2014]. Both college and vocational students attach a lot of importance to the opportunity for extra earnings when looking for a part-time job. As reported in the MEMO, financial constraints were the number one reason to combine work and study for 70 percent of vocational students in 2015.

The overwhelming majority of MLSP and SWP students have their vocational training funded by regional governments. On the one hand, vocational education programs are quite affordable, and on the other, low income does not allow families to consider self-funding options. As a result, students normally have to choose public-funded educational programs over those of their particular interest. Under such circumstances, cases of opting for tuition-based programs indicate deep commitment to a specific profession or field of study. According to the MEMO, only 1.9 percent of MLSP students and 17.9 percent of SWP students on average paid tuition in 2010–2015.

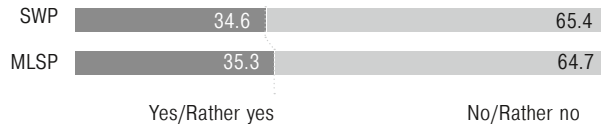
[7] Arithmetic mean for the five-year observation period, from 2010 to 2015.

Figure 3. **College and Vocational Students' Perceptions of Their Family's Financial Standing during School Years, arithmetic mean for 2010–2015**



Source: Monitoring of Education Markets and Organizations.

Figure 4. **Vocational Students' Perceptions of Relatedness between Part-Time Job and Current Major, 2015**



Source: Monitoring of Education Markets and Organizations.

Therefore, statistics and the results of MEMO sociological surveys allow identifying the factors affecting transition of vocational graduates from study to work. On the one hand, the decline in average student age increases the risk of unrealistic expectations about the selected profession/specialization in young people. This is likely to inflate the proportion of graduates getting jobs that mismatch their skills. Moreover, younger age of vocational students can be regarded as a factor increasing the likelihood of engaging in higher education instead of entering the labor market after graduation. Students often treat vocational education as a way to help themselves get into college, not as training to get a job.

On the other hand, as many vocational students come from low-income families, they often have to enter the labor force. Not in-

frequently, such students tend to focus on salaries rather than education-occupation match when looking for a job. It remains an open question whether any type of work-study job increases their competitive edge in the labor market or whether combining study with unrelated work becomes a barrier to academic achievement and entails "penalties" in subsequent employment.

Low financial standing normally reduces the range of education programs available, making prospective vocational students choose from public-funded options. Cases where relatively low-income households decide to pay for education themselves indicate deep interest in a specific profession or occupation. The second part of this study will test the hypothesis that tuition-based vocational training is a good predictor of education-job match.

In addition to socioeconomic family characteristics and the demographic situation, the national policy designed to provide successful study-to-work transition is another significant factor determining the procedure and results of vocational graduate employment. In particular, development of employer-sponsored education to offer job placement guarantees for graduates reduces greatly the probability of unemployment among vocational graduates, increasing their chances for getting a job matching their professional qualifications. However, sponsorship agreements oblige employers to incur extra costs by providing social support measures, so they might want to compensate for those costs by underpaying fresh graduates during the agreed required probation period. The second part of this article will test the hypotheses that employer-sponsored education increases employability of vocational graduates and that employers pay lower salaries to such graduates during the agreed required probation period.

2. Employment of Vocational Graduates

This section of the article uses data of the National Statistical Sampling Survey of Graduate Employment (SGE) conducted by Rosstat in 2016. It includes information on the 2010–2015 graduates with college (Bachelor's, Specialist's, Master's) and vocational (including former basic vocational education) degrees. For the purpose of this study, only information on vocational graduates will be used. The sample includes respondents aged 18–29. Sampling survey of graduate employment has three specific advantages that are critical to this study:

(i) Access to information on educational attainment, including cases of combining work and study and sources of education funding;
(ii) Information on employment is complemented by data on graduates' earnings, which is one of the key characteristics of the labor market (this is what differentiates SGE from other Rosstat-administered surveys, including that of labor force);
(iii) This survey is representative for the population group analyzed and the sample is large enough to allow statistical analysis.

Table 1. **Descriptive Statistics**

	SWP	MLSP
N of observations (people)	9123	4047
Weighted N of observations (1,000 people)	2790.8	1105,2
Professions/Fields of Study		
Natural Science	0.2	0
Humanities	4.9	0
Social Science	23.5	34,2
Education and Teaching	7.8	0
Healthcare	13.5	0
Culture and Arts	2.8	2,5
Engineering, Technology and Technology Science	43.6	57,7
Agriculture and Fishing	3.7	5,6

	SWP	MLSP
Percentage of males (%)	48.9	62,6
Average age (years)	23.6	22,9
Percentage of graduates continuing to college (%)	15	4,5
Combining work and study (%)		
None	76.1	83,2
Unrelated work experience	12.1	9,1
Related work experience	11.8	7,7
Population structure (%)		
Employed	79.9	78,3
Unemployed	7.4	9
Economically inactive	12.7	12,7

Среди занятых выпускников системы СПО

N of employed population (people)	7202	3086
Weighted N of employed population (1,000 people)		865.3
Professional status (%)		
Administrators	2	0.9
High-skilled workers	13.9	1.0
Middle-skilled workers	34.6	5.7
Information professionals	3.8	3.4
Pink-collar workers	17.8	30
Skilled agriculturals	1.5	1.7
Skilled workers	12.3	28.8
Mechanics, operators, etc.	10.1	19.2
Unskilled workers	4.2	9.3
Living in a city (%)	77.3	72.6
Education-job match* (%)	61.8	56.5
Average salary (rubles)	20200.4	19704.9

Participation in further education in the past 12 months (%)	16.4	10.8
Industry (%)		
Agriculture	3.2	5.6
Fishing	0.2	0.2
Mining	2.5	3.7
Manufacturing	12.5	17.8
Water-energy nexus	2.3	2.0
Construction	5.9	11.3
Wholesale and resale	20.1	20.5
Hospitality	3.3	9.0
Transport and communication	8.9	11.4
Finance	3.4	0.3
Tertiary sector	4.6	3.7
Public administration	7.7	3.4
Education	7.9	3.1
Healthcare	12.7	1.4
Utilities and social infrastructure	5.1	6.6

* Based on respondents' self-assessment. Question: "Is your career related to your education / field of study?".
Source: SGE, Rosstat, 2016

Table 1 provides descriptive statistics on MLSP and SWP graduates. The proportion of graduates who gained at least some work experience as students turns out to be only 24 percent among MLSP graduates and about 17 percent among SWP graduates, which is lower than reported by the MEMO statistics referred to in the first part of the article (44%). And then, only half of them combined study with jobs related to their field of study. At the moment of the survey (April–September 2016), 79 percent of 2010–2015 vocational graduates were employed, about 8 percent had no job, and 13 percent were economically inactive.

Data on employment of graduates is classified by the major occupation categories based on the Russian National Classifier of Occupations[8]. The majority of SWP graduates are employed as middle-qualified workers (34.6%). The major occupations among SWP graduates include mid-level practitioners and retailers (7.8 and 7.5 percent, respectively). MLSP graduates mostly fill pink-collar and skilled worker jobs (approximately 30 percent in each category). The most widespread occupations among MLSP graduates include shop assistants (9.6%), agricultural mechanics and service technicians (7.3%), and food preparers (7.1%). Every one vocational graduate out of five works for a trading company. Manufacturing is the second most popular industry, accounting for 12.5 percent of SWP graduates and 17.8 percent of MLSP graduates. About 30 percent of SWP graduates are employed in industries traditionally associated with the public sector, i. e. public administration, education and healthcare.

At the moment of the survey, only a small percentage of vocational graduates who had been willing to find a job could be classified as unemployed (8.5 percent of economically active SWP graduates and 10.3 percent of MLSP graduates). The unemployment rate among vocational graduates is above the national average by nearly half (5.5%[9]), approaching the rate among youth aged 15–19 (9.9%), as reported by Rosstat[10]. Figure 1 presents data on unemployment among European youth aged 15–29 with levels of educational attainment corresponding to ISCED levels 3 and 4. Statistics on Russia include MLSP graduates (ISCED levels 3 and 4) and SWP graduates (ISCED levels 3 and 5) aged 15–29[11], the unemployment rate among

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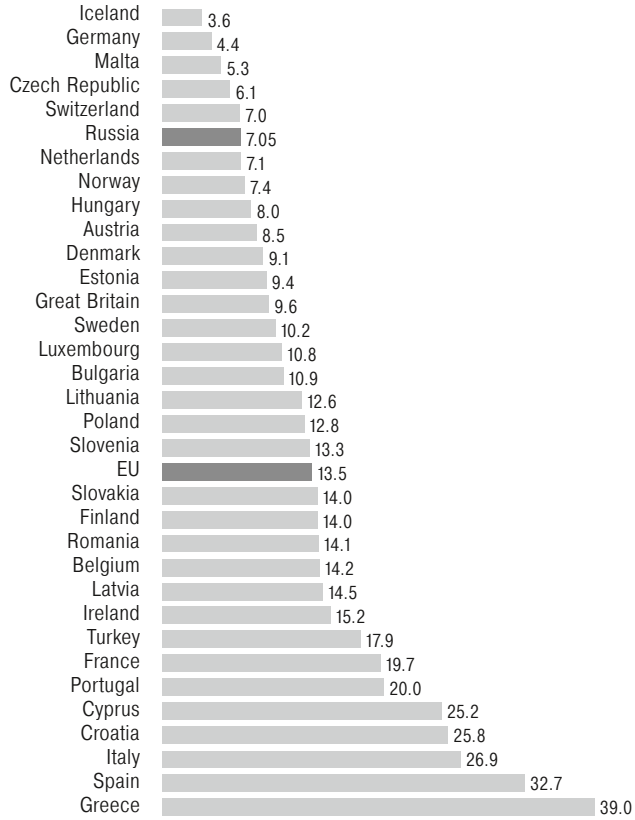
[8] http://www.consultant.ru/document/cons_doc_LAW_115767/

[9] Rosstat. Labor Force Resources. Available at: http://www.gks.ru/free_doc/new_site/population/trud/trud6.xls

[10] Rosstat. Based on a Survey of Labor Force. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1140097038766

[11] The unemployment rate among MLSP graduates only, whose level of education corresponds more to the EU sample, is 7.5 percent. Rosstat. Based on a Survey of Labor Force. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1140097038766

Figure 5. **Unemployment Rates in EU Countries among Youth Aged 15–29 with Levels of Educational Attainment Corresponding to ISCED Levels 3 and 4 (%)**



Source: Eurostat & Rosstat, 2016.

them being 7.1 percent. As we can see, the situation in Russia is one of the most favorable in Europe, given that the average EU unemployment rate in this cohort is 13.5 percent, being higher in southern Europe and reaching 27, 33 and 39 percent in Italy, Spain and Greece, respectively.

The unemployment rate in Russia is lower than in the EU countries across all population groups. This is explained by the Russian model of labor market: rather low minimum monthly wage and scant government assistance for the unemployed (unemployment benefits and access to them) basically push young workers to enter the labor market as soon as possible, accepting one of the first job offers[12]. As a result, about 40 percent of vocational graduates are mismatched to their

[12] For more details on the Russian model of labor market and international labor market comparisons, see, for example, [Gimpelson, Kapelyushnikov 2015; Gimpelson, Kapelyushnikov, Roshchin 2017].

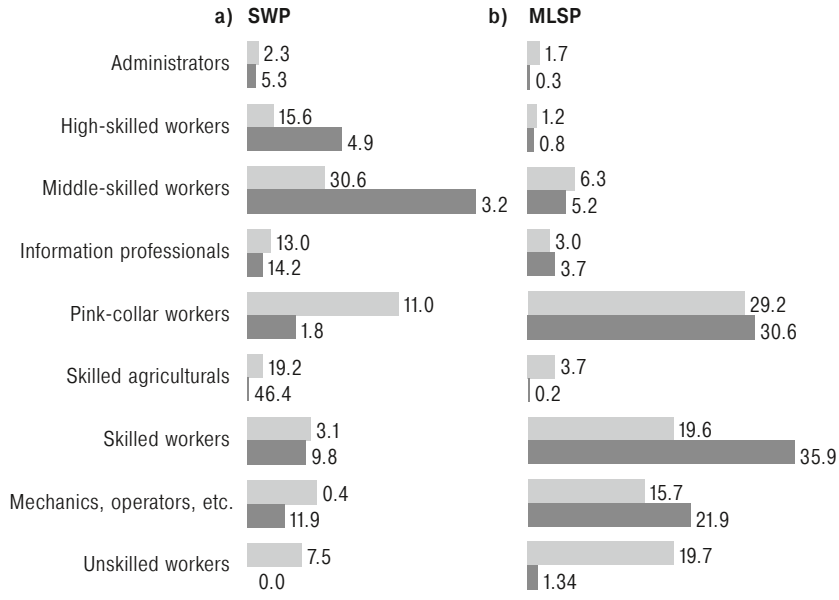
jobs (Table 1). According to findings, education-job mismatch is typical of nearly 70 percent of vocational graduates of all ages represented in the Russian labor market. The situation is slightly better among college graduates, where the job mismatch rate hovers around 50 percent [Gimpelson et al. 2009]. In the United States, mismatch between education and occupation is observed for only 20 percent of university and college graduates [Robst 2007], and the same is true for Sweden [Nordin, Persson, Rooth 2010].

When prospective vocational students are choosing their future profession or occupation as ninth-graders, they have no clear idea of the labor market situation, so their career preferences are likely to change over time. Besides, technology, market demand and other external factors in today's world modify very rapidly the structure of economy and its demand for specific occupations and qualifications, making workers adapt by learning new skills or even professions. Quite expectedly therefore, recent graduates have to try various options to find a job that will suit them the most. Such search does not entail negative consequences for the economy as long as graduates are able to find jobs where they can use and improve their knowledge and skills and be paid accordingly. However, judging by the distribution of 2010–2015 vocational graduates among occupations, most employed SWP graduates whose jobs match their education occupy positions of middle- and high-skilled workers (46 and 19 percent, respectively), while nearly one third of SWP graduates mismatched to their jobs are employed as pink-collar workers at positions that require lower levels of skills (Fig. 6a). As for MLSP graduates (Fig. 6b), those with matching jobs are mostly employed as blue-collar workers, and one out of five MLSP graduates who changed their occupation has an unskilled job, while the rest are employed in the same occupations as graduates who remained loyal to their field of study. On the whole, jobs that are filled by MLSP graduates do not require a high level of skills and thus have low entry barriers even for those with no relevant education or professional competencies. Vocational graduates mismatched to their jobs are less likely to continue to college (7 percent as compared to 11 percent in the job-match group) and participate in further education (9 as compared to 16 percent, respectively).

In order to identify the factors that can affect[13] the probability of employment and education-job match among vocational graduates, a series of econometric models will be estimated below. In Table 2, Specifications 1–3 present the results of evaluating logistic regression for different subsamples: all vocational graduates (1), SWP graduates (2), and MLSP graduates (3). In all the specifications, unemployed and economically inactive population serves as the reference cate-

[13] Due to possible interactions between the dependent and some of the explanatory variables, all the regression analysis results in this study should be interpreted in terms of conditional correlation.

Figures 6. **The Distribution of Vocational Graduates Across Occupations** (%)



Source: SGE, Rosstat, 2016.

gory[14]. Specifications 4 and 5 assess the probability of education-job match using multiple logistic regression independently for the subsamples of SWP and MLSP graduates.

When the probability of employment as such as assessed, MLSP graduates are found to have more difficulty getting a job than SWP graduates, all other things being equal. The fact of education being funded by students (or their parents) shows no statistically significant relationship with the probability of employment but increases the probability of education-job match substantially. By deciding to invest

[14] Of course, the unemployed and economically inactive population are two heterogeneous groups. However, we find it possible to join them into one reference group when evaluating the model here because the critical study on labor force transitions in Russia [Gimpelson, Sharunina 2015] shows that most individuals enter the labor market by jumping from economic inactivity directly into employment, omitting the unemployment state. The modern concept of labor force stipulated by the International Labor Organization and approved by Rosstat Order No. 680 of December 31, 2015 suggests new terminology to describe labor force, expanding the category of the unemployed so that part of economically inactive population is now treated as potential labor force. In SGE, which served the empirical basis for this study, Rosstat maintains the former definition of labor force, so we have to regard unemployed and economically inactive people as a single category to analyze employability.

Table 2. **Logistic Regression Results: Modelling Employability of Vocational Graduates, Marginal Effects**

	1	2	3	4		5	
				SWP		MLSP	
Model Specification	All Vocational Graduates	SWP	MLSP	Education and Job Match	Education and Job Mismatch	Education and Job Match	Education and Job Mismatch
Education level ("0" for SWP, "1" for MLSP)	−0.016***						
Self-funding	−0.012	−0.012	−0.02	0.027***	−0.015**	0.097***	−0.123***
Employer sponsorship	0.048**	0.027*	0.09	0.170***	−0.161***	0.202***	−0.122***
Years after graduation from vocational school	0.017***	0.017***	0.015***	−0.006***	0.023***	−0.014***	0.030***
Currently pursuing higher education	−0.117***	−0.116***	−0.122***	−0.045***	−0.069***	−0.080***	−0.042
Professions/Fields of study (*Social Science being the reference variable*)							
Natural Science	0.113	0.158		0.041	0.074		
Humanities	−0.026**	−0.024**		−0.084***	0.060*		
Teacher Education	0.018	0.019		0.135***	−0.118***		
Healthcare	0.038***	0.039**		0.281***	−0.250***		
Culture and Arts	−0.008	0.012	−0.377***	0.054	−0.042	−0.372***	0.069
Engineering, Technology & Technology Science	−0.018***	−0.015***	−0.038***	−0.024	0.008	−0.058***	0.019
Agriculture & Fishing	−0.044**	−0.032	−0.091***	−0.163***	0.126***	−0.051	−0.039*
Combining work and study (*"No" being the reference variable*)							
Yes, related work experience	0.110***	0.143***	0.080**	0.237***	−0.119***	0.213***	−0.133***
Yes, unrelated work experience	0.071***	0.096***	0.02	−0.103***	0.186***	−0.072*	0.098***
Sociodemographic characteristics							
Age	0.019***	0.019***	0.021***	0.022***	−0.003	0.023***	−0.002
Sex ("1" for male)	0.091***	0.070***	0.153***	0.025	0.044***	0.091**	0.063***
Living in a city	0.002	−0.004	0.01	0.023***	−0.027***	0.067**	−0.053***
N of observations/Population size	11015/ 3 294 820	7489/ 2 317 669	3319/ 920 098	7489/ 2 317 669		3319/ 920 098	

Notes: 1. Additional control variables included federal subjects of Russia, health status, marital status, and parental status.
2. ***—significance level of 0.01, **—significance level of 0.05, *—significance level of 0.10.
3. Marginal effects are used instead of coefficients.
4. Standard errors were obtained using the robust method when estimating logit models and the delta method when estimating marginal effects.
Source: SGE, Rosstat, 2016.

their own funds or the funds of their family into education, candidates will most likely be more careful in making their career choices, which are sometimes affected by education costs already incurred. With employer-sponsored education, where graduates are obliged to work for a specific employer for an agreed period of time after graduation, the probability of employment as such is higher for SWP graduates, while the probability of education-job match increases considerably for all vocational graduates.

Employability is also related to the type of education or profession acquired by vocational graduates, being the highest among medics and lower or statistically indistinguishable from the reference value (the social science group) in all the other professions. As far as education-job match among SWP graduates is concerned, advantage is also enjoyed by teacher education graduates. In MLSP, agricultural education is found to produce the highest probability of graduates being mismatched to their jobs.

Earlier studies based on Russian data revealed a relation of combining work and study to the probability of post-graduation employment [Roshchin 2006]. This study confirms the variation in graduate employability as a function of combining work and study and specifies the nature of such function, which is that post-graduation employment probability is affected by relatedness of major to work-study job. For instance, combining study with related work increases employability of both SWP and MLSP graduates as compared to those who did not combine work and study at all. However, combining study with unrelated work has no significant impact on the probability of getting employed for MLSP graduates. The probability of post-graduation education-job match depends on the type of work that was combined with study, being higher if such work matched the skills being acquired and lower if it did not. The situation with education-job mismatch is just the opposite.

In addition to the fact of employment, it is also the quality of jobs filled by vocational graduates that matters. The effects of different factors upon the size of vocational graduates' salaries as one of the key job characteristics will be measured using a modified Mincer equation estimated using the method of least squares (MLS) for the weighted sample of employed vocational graduates. Table 3 contains estimates for all vocational graduates as well as separately for SWP and MLSP graduates.

All other factors held constant, MLSP graduates tend to be paid lower than SWP graduates. According to studies that assessed the returns to education in all age cohorts, initial vocational training provides almost no statistically important advantage over high school education, whereas secondary vocational training yields positive returns, however lower than returns to higher education [Denisova, Kartseva 2007; Gimpelson, Kapelyushnikov 2011]. Research on young workers' salaries revealed returns for graduates in secondary vocational

Table 3. **Least-Squares Regression Analysis Results (logarithm of monthly earnings being the dependent variable)**

	All Vocational Graduates	SWP	MLSP
	Coef.	Coef.	Coef.
Education characteristics			
Education level ("0" for SWP, "1" for MLSP)	–0.059**		
Self-funding	0.037***	0.026**	0.060***
Employer sponsorship	0.050	0.042	0.069
Years after graduation from vocational school	0.009***	0.008**	0.010*
Currently pursuing higher education	–0.020*	–0.031***	0.073
Professions/Fields of study (Social Science being the reference variable)			
Natural Science	0.017*	0.013*	
Humanities	–0.009	–0.022	
Teacher Education	0.034*	0.037*	
Healthcare	0.080**	0.050*	
Culture and Arts	–0.024*	–0.022*	–0.160***
Engineering, Technology & Technology Science	0.055***	0.037***	0.102***
Agriculture & Fishing	0.012	0.009	0.037
Combining work and study ("No" being the reference variable)			
Yes, related work experience	0.057***	0.057***	0.097**
Yes, unrelated work experience	0.045***	0.042**	0.046**
Sociodemographic characteristics			
Age	0.015***	0.015***	0.015***
Sex ("1" for male)	0.174***	0.182***	0.152***
Living in a city	0.039**	0.039***	0.028**
Workplace characteristics			
Education-job match	0.052***	0.043***	0.049***
Logarithm of working hours	0.335***	0.307***	0.400***
N of observations / Population size	6,734 / 2,022,823	4,714 / 1,449,367	2,020 / 572,964

Notes: 1. Additional control variables included federal subjects of Russia, workplace characteristics (type of economic activity and occupation), health status, marital status, and parental status. 2. ***—significance level of 0.01, **—significance level of 0.05, *—significance level of 0.10. 3. Standard errors were obtained using the robust method.
Source: SGE, Rosstat, 2016.

education but no returns to basic vocational training [Roshchin 2006]. Other studies have found no difference in returns to education between high school graduates and workers of all categories, except those who later engaged in higher education [Rudakov 2015].

As for sources of education funding, employer sponsorship has no statistically significant influence on graduates' earnings. In other words, no support has been found for the hypothesis that sponsor employers try to compensate for their expenses by underpaying sponsored graduates.

In Russia's contemporary labor market, graduates who obtained engineering education in basic and secondary vocational schools experience positive returns to education [Denisova, Kartseva 2007]. Findings of this study also provide evidence of returns to medical and engineering education.

One of the key findings in this study is that education-job match provides wage return to all recent vocational graduates. Among graduates employed in the same professions and industries, those who combined study with major-related work tend to be paid more. Probably, when students decide to gain work experience in their field of study, they get access to more attractive jobs. At the same time, most graduates whose employment does not match their qualifications fill jobs that require lower levels of competencies. Returns to combining study and major-related work are higher than returns to unrelated work experience. However, any combination of work and study has positive effects on vocational graduates' salaries at the early career stage. Obviously, graduates who gain work experience by the time they complete their studies acquire additional knowledge and competencies sought by employers.

Summing up, the findings of this study confirm the model of study-to-work transition described by Sergey Roshchin [2006], which implies that combining work and study has positive returns by increasing employability and starting salaries of graduates. The data used in this study only allows evaluating the short-term effects of combining work and study. It is not implausible that in the long run more success will come to students who chose to focus on learning instead of working during their spare time or even at the expense of learning. It has been established, however, that students combining work and study wind up having better soft skills, i. e. being better at time management, taking responsibility, and other competencies that are in high demand in the labor market [Vasilyev, Roshchin, Maltseva 2015]. In addition, a successful career start just after graduation yields considerable returns at subsequent career stages, too [Robst 2007; Zhang 2008]. Further research is necessary to explore the long-term returns to education as a function of different characteristics of the learning process.

Conclusion

Transition from study to work is one of the milestones in any career. If someone cannot find a job for too long a period of time or has to accept unskilled labor jobs during that period, it will have an impact on the rest of their career. In Russia, peak earnings occur pretty early in life, and the peak earning age has decreased even more over the past decade, dropping to 30–35 years in 2015. In most developed countries, earnings peak at older age cohorts [Gimpelson, Kapelyushnikov, Roshchin 2017]. Given that youth population has declined over the past decade [Dudyrev et al. 2017], the cost of early career mistake is growing for young workers as well as for the whole economy.

The Russian model of study-to-work transition suggests that successful employment of graduates should be promoted through student employment. Lots of students combine work and study, mostly in the form of part-time jobs. The most common motivations of such students are the need to earn a living and the desire to gain work experience that will help them develop necessary skills and competencies and add to their competitive edge in the labor market later on [Roshchin 2006].

Successful employment of vocational graduates is a critical indicator of education performance. However, it is not only the very fact of employment but also the levels of salary and the quality of jobs filled by workers that should be considered in assessing effectiveness of study-to-work transition. Otherwise, national policy measures and relevant reporting requirements will describe not the effort results but simply the natural processes typical of the Russian labor market.

The findings confirm feasibility of employer-sponsored education as a relevant national policy measure to increase effectiveness of study-to-work transition among vocational graduates. First, employer-sponsored education is positively related to higher probability of education-job match. Second, employers do not seek to compensate for education-related expenses by underpaying graduates during the required employment period. In this case, transition from education to the labor market is effective not only in terms of graduate placement but also in terms of employment conditions. It appears vital to promote further spread of employer-sponsored education practices and create the conditions to encourage business engagement.

As compared to the situation of 1995–2003 described by Roshchin [2006], nowadays study-to-work transition of vocational graduates looks more like a “ford” than an “slough”. Most graduates find jobs within a short period of time. On average, starting salaries of recent graduates constitute 75 percent of the salaries of vocational graduates of all ages[15]. Yet, some graduates wind up in an “slough” when they get employed as unskilled workers. They may do so out of

[15] Rosstat. Average Gross Payroll by Levels of Educational Attainment. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/wages/labour_costs/#

despair, being unable to afford a longer job search, or as a result of lacking information about the labor market—what salaries they may expect, how to do a successful job search, how to write a résumé, and how to behave in job interviews.

About 40 percent of vocational graduates are mismatched to their jobs. They largely fill positions that require lower levels of competencies than they have acquired and receive lower salaries than they could expect. It could be assumed that graduates with education-job mismatch will invest in themselves more actively to compensate for the lack of knowledge and skills in the profession. However, that is not the case. Graduates mismatched to their jobs are considerably less likely to go to college and hardly ever participate in further education.

From the perspective of education policy, a high degree of education-job mismatch among recent graduates indicates that resources are used ineffectively, meaning that such graduates do not make full use of the skills that they invested into and thus do not receive the expected economic returns.

The results obtained in this study reveal a positive relationship between combining work and study and employability of graduates. Students who combine study with major-related work are more likely to fill matching jobs after graduation. Conversely, when work combined with study is unrelated to the major, graduates are more likely to be mismatched to their jobs. Work experience gained in a particular field translates to specific human capital that yields returns in the form of earnings. It may be that vocational graduates find it hard to refuse from the benefits of staying with the same employer they engaged with as students and start a new career from scratch, even though it would match their skills more. At the same time, students who combined study with major-related work may be initially more motivated to pursue careers in their field of study—that is the reason why they ignored more profitable part-time jobs that would not help them enhance their skills in the selected profession.

A considerable part of the problems associated with study-to-work transition of vocational graduates could be tackled by developing and improving the system of professional orientation in middle school. This is especially important now that more and more vocational students are middle school graduates. Employment of graduates to education-matching jobs can also be promoted by strengthening the relations between vocational schools and employers to provide students with salaried part-time job opportunities related to their majors.

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