HIGHER EDUCATED PEOPLE AND (RE)EMPLOYMENT PROBABILITY IN ROMANIA

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Abstract: : The aim of this research is to analyze the (re)employment probability of long-term university graduates registered as unemployed at the National Agency of Employment Romania. Using multinomial logistic regression and a large dataset of 144155 completed registered spells, we estimated the effect of seven explanatory variables on the (re)employment chances of higher educated unemployed.

JEL classification: J64, J24

Key words: critical; higher education, logistic regression, employment

1. INTRODUCTION

Unemployment has dramatic consequences on affected individuals. However, the effect of unemployment and underemployment on higher educated individuals is different, due to the unique characteristics of this labor force category, their high expectations, as well as the financial resources already invested in their development. Recent studies show that unemployment and underemployment are phenomena with devastating negative effects in the lives of higher educated people ([4, 16]).

In the last years, the significant increase of the graduate unemployment, graduate underemployment, the magnitude of the gap between acquired skills of young graduates and the demanded skills of employers and the expansion of higher education in modern society are topics that captured the attention of researchers (see [29, 15, 25, 22, 30]). [26] analyzed the determinants of transition from higher education to work in nine European countries (Austria, Czech Republic, Finland, France, Germany, Italy, Netherlands, Norway, Spain, Sweden and United Kingdom) and proved the existence of disparities between the North of Europe and the South regarding the difficulty of getting a job for the first time. His research also confirms the hypothesis that the level of education, the field of education and the individual job search play a significant role in the on the probability of individuals finding their first job. [20], [4] and [28] proved in their studies an association between the unemployment of higher educated individuals and the universities where they graduated; a significant percentage of employers prefer to hire graduates from well-known universities, with a tradition that offer the guarantee of a quality education. Similar conclusion is emphasized by [23] and [14]; the reputation of some well-known higher education institutions has a positive and significant effect on the probabilities of their graduates to find a job.

Labor market integration of higher educated individuals and their subsequent trajectories is influenced by their educational fields and specialization too; depending on the educational field to which they belong, the length of time to find a job according to their own aspirations is higher for some graduates than others ([19]). Also, a series of recent studies argue that the training provided by higher education institutions has a strong theoretical character, it neglects practical aspects related to the preparation of students for their future job and employers have unrealistic expectation about the practical skills that young graduates looking for a job have ([19,17, 13]).

Another potential augmenting factor of graduate unemployment is the fact that this labor force group has high expectation of wage and usually rejects job offers that are not in line with their own aspirations ([19, 27]). [5] analyzes the effect of specific active programs against underemployment and unemployment of higher educated people in Tunisia. [24] studies the graduate unemployment in Africa in general, and in Nigeria in particular.

[2] investigate the unemployment of engineering graduates on the UK labor market. Graduate unemployment, graduate underemployment and causality between higher education, unemployment rate and economical background are topics that received attention of Romanian researchers in the recent period. [1] investigated some aspects of higher education in Romania, Bulgaria and Hungary and underlined that for Romania and Hungary, the number of students increased significantly in a very short period of time. During the transition, in Romania the increase of enrolment in higher education institutions was not followed by a corresponding increase of the number of professors, leading to a depreciation of the quality of higher education. Using the Granger causality approach, the authors pointed out that there is no significant causality between the number of university students and the number of high-school students and underlined a divergence between gross domestic product and education expenditures in Romania, during the analyzed period. [11] and [12] proved an association between budget expenditure allocated to education and economic growth, through productivity channel.

Using dynamic causality analysis, [6] analyzed the co-integration between higher education (measured by the number of enrolled students) and economic growth in Romania during 1984 and 2008. The results strengthens the conclusion of the above mentioned study, Granger test pointed out to an unidirectional causality running from gross domestic product per capita to higher education. [18] analyzed the relationship between higher education demand and unemployment rate, using a classic Engel-Granger Two Step Methodology. The results show that with the increase of the higher education demand, the overall unemployment rate is diminishing for the analyzed period. [10] investigated the individual and social consequences of unemployment, in general, and of higher educated individuals in particular, for Romania, during 2009 – 2015. [8] analyzed the effects of factors influencing unemployment duration and exit destinations of higher educated people in Romania and Hungary; there is a gender gap in terms of unemployment duration and exit destinations for both countries, the regression coefficient for men is positive, that means an increase of exit to a job hazard, compared with women, the reference category. Romanian higher educated women have an 11.6% lower exit to a job hazard rate than men. Hungarian higher educated men have an 8.8% higher exit to a job hazard rate than women. Higher education is a lowering factor of the unemployment gender gap for both countries. Regarding the age

variable, for both countries the research shows a positive association between age and unemployment duration. Both countries have disparities between different regions too. For Romania, higher educated people living in rural areas have a 12.9% lower exit to a job hazard rate than people from urban area, with the same level of education. Again, higher education is decreasing the urban-rural gap; for the entire dataset of Romania, the differences between rural unemployed and urban unemployed are higher. Another interesting result is that the exit to a job rate of Romanian graduates is sensitive to the economical background. [9] and [21] investigated issues related to labor market insertion of higher educated individuals, the mastery of higher education in Romania, inadequate skills in relation to market requirements and graduate underemployment.

The aim of this study is to analyze determinants of the (re)employment probability of Romanian higher educated people. For the empirical analysis we used a large dataset of all the long-term university graduates registered as unemployed at the National Agency of Employment Romania during 1st January 2009 and 31st December 2010. Unfortunately, at the time of this study, we did not have more recent micro-data about unemployment and (re)employment of long-term university graduates.

2. PRELIMINARY DESCRIPTIVE STATISTICS

Our dataset has 144155 completed registered spells; for each spell we have information about gender of the registered unemployed, age, region of living, area of living, marital status, if the unemployed received allowance during his/her current spell, if the unemployed has previous work experience or not, if the unemployed has a disability or not and the reason for exit from registered unemployment.

A spell ends when the person is deactivated from the National Employment Agency registration. We have the reason of deactivation for each spell, such as finding a job, expiry of the legal period for receiving unemployment allowance, going abroad for less or more than 3 months, enrolling in an education form, unjustified decision to reject a job offer, maternity leave etc.

Explanations regarding the exogenous and endogenous variables of our study are presented in table 1 from din appendix. We would like to underline that the term (re)employment is used in the study because we have in the sample first-time job seekers who just graduated the university and workers who lost their jobs and are looking for a new one.

Out of all 144155 dataset spells, 84834 (58.5%) belong to female long-term university graduates and 59781 (41.5%) to male long-term university graduates. 6.1% from total female spells were deactivated due to short-term (re)employment (less than 12 months), 19.2% were deactivated due to long-term (re)employment (more than 12 month), and 0.2% were deactivated due to self-employment; all the other spells were deactivated from the registration due to different reasons (e.g. expiry of the maternity leave, going abroad for short or long-term, maternity leave, invalidity, unclear reasons for deactivation etc), meaning that the person is inactive on the labor market. 6.5% from male spells were deactivated due to short-term (re)employment, 22.5% were deactivated due to long-term (re)employment and 0,2% were deactivated due to self-employment. In table 1 we present the distribution of registered spells by age and the share of short –term (re)employment, long-term (re)employment and self-employment function of age groups.

As we can notice from table 1 from appendix, young graduates aged in between 21 and 24 years are the most disadvantaged. Age has a clear effect on the (re)employment probability of higher educated people, during the analyzed period.

Table no. 2. Data about analyzed spells by age

Age	Number of spells (total dataset)	% (total dataset)	%		
			Short-Term (Re)employment	Long-Term (Re)employment	Self-Employment
22-24	21558	36.1	4.7	14	0.1
25-34	21082	35.3	7.6	22.8	0.4
35-44	6458	10.8	8.2	27.2	0.5
45-54	7175	12.0	6.3	31.6	0.3
55-65	3508	5.9	5.0	25.5	0.2

Out of all 144155 registered unemployment spells, 26627 (18.5%) belong to higher educated individuals living in rural areas, and 117488 (81.5%) belong to higher educated individuals from urban area. As we can notice, in Romania graduated unemployment is predominantly urban. 5.7% of rural spells end due to short-term (re)employment, 16.1% end due to long-term (re)employment and 0.2% spells are deactivated due to self-employment. For the urban spells, 6.4% end due to short-term (re)employment, 21.6% end due to long-term (re)employment and 0.2% are deactivated due to self-employment. In table 3 we present the distribution of registered spells by region and the share of short –term (re)employment, long-term (re)employment and self-employment depending on the administrative regions of Romania. Bucharest-Ilfov is the region that appears to offer best chances to find a job for higher educated individuals, followed by West region. These two regions have the highest self-employment rate within higher educated registered unemployed. South-West Oltenia region is in the worst position in terms of (re)employment probability, as we can notice from empirical data. We check if these results are significant in the econometrical analysis.

Table no. 3. Data about analyzed spells by region

Region	Number of spells (total dataset)	% (total dataset)	%		
			Short-Term (Re)employment	Long-Term (Re)employment	Self-Employment
North-East	22793	15.8	5.3	25.1	0.0
West	16828	11.7	7.8	21.4	0.4
North-West	19297	13.4	4.9	18.4	0.3
Central	19008	13.2	6.4	20.9	0.4
South- East	15602	10.8	6.3	15.9	0.2
South-Muntenia	17465	12.1	7.5	19.8	0.1
Bucharest- Ilfov	12488	8.7	9.7	27.1	0.6
South-West Oltenia	20634	14.3	4.2	16.6	0.2

In table 4 is presented the distribution of registered spells by marital status of individuals at the time of registration.

Table no. 4. Data about analyzed spells by marital status

Marital status	Number of spells (total dataset)	% (total dataset)	%		
			Short-Term (Re)employment	Long-Term (Re)employment	Self-Employment
Unknown	11925	8.3	6.5	24.8	0.1
Unmarried	81396	56.5	5.7	16.8	0.2
Married	47696	33.1	7.2	25.7	0.4
Widowed	2821	2.0	7.7	24.6	0.5
Divorced	277	0.2	5.4	23.5	0

Out of all 144155 registered spells, 58.7% belong to higher educated individuals who received unemployment allowance during their current spell (UI), and 41.3% belong to higher educated individuals without unemployment allowance during their current spell. 7.5% of UI spells ended in short-term (re)employment, 21.3% UI spells ended in long-term (re)employment and 0.5% ended in self-employment. 4.6% of the non UI spells ended in short-term (re)employment, 19.5% in long-term (re)employment and all the rest have an unclear reason for deactivation (75.8%). Most of them are probably long-term unemployed with a higher education. 55.6% of registered spells belong to higher educated individuals who are first time job seekers, and 44.4% are spells of graduates with a previous work experience. 8% of the spells of graduates with a previous work experience ended in short-term (re)employment, 22.9% ended in long-term (re)employment and 0.5% ended due to self-employment. In contrast, 4.9% of spells that belong to graduates without previous work experience ended in short-term (re)employment, 18.7% ended in long-term (re)employment and only 0.1% ended due to self-employment.

We will investigate more the previous experience work effect on (re)employment probability in the econometric section of paper. 230 spells (0.2%) belong to university graduates with a disability, and the rest of 99.8% declared a normal health status. 3.9% of disabled graduates ended their spell due to short-term (re)employment, 18.7% ended in long-term (re)employment and none of them in self-employment. By contrast, 6.3% of graduates with a normal health status exit to a short-term job, 20.5% to a long-term job and 0.2% to self-employment.

3. MULTINOMIAL LOGISTIC REGRESSION RESULTS

As we above mentioned, for each spell we had information about the reason of deactivation. With the data in hand, we can analyze the effect of the mentioned explanatory variables on the status of an individual at the time of his/her deactivation spell.

We have 22 reasons for deactivation in our dataset. We created a variable named "*status*" describing the exit state of each registered individual. At the moment of deactivation, a person can be short-term (re)employed (for less than12 months) (1), long-term (re)employed (for more than 12 months) (2) or inactive on the Romanian labor market (3). These are the three categories of the "*status*" endogenous variable.

Self-employment was considered as long-term employment in the econometrical analysis, since the number of spells deactivated due to self-employment is too small to use it as a different status category.

Since status is a categorical variable, we will use multinomial logistic regression to estimate the effect of the explanatory variables on the probability transition from unemployment to short-term (re)employment, long-term (re)employment or to non-participation. All the spells with an unclear reason for deactivations or spells deactivated due to death of the person or retirement were dropped from the econometrical analysis. For processing the data, we used SPSS 17.0. The explanatory variables were simultaneously analyzed.

The reference category is inactivity (non-participation) at the deactivation time. The results of multinomial logistic regression analysis are presented in table 5 from appendix. *B* gives us the estimated values of regression coefficients and *Exp (B)* is the odd ratio estimated for each explicative variable.

Analyzing the results from table 5 from the appendix, we can underline the following:

- When **status=1, short-term (re)employment**, the regression coefficient of gender variable is negative, meaning that higher educated women are more likely to exit from unemployment in non-participation than exit to a short-term job, compared with higher educated men. Since the regression coefficient is negative when **status=2, long-term (re)employment** too, we can conclude that higher educated women have a lower probability to exit to a job than men during the analyzed period, and the observed difference is statistically significant. The gap between genders is slightly higher for long-term (re)employment than short-term (re)employment. The logistic regression confirms what we noticed from the preliminary descriptive statistic analysis for gender variable.
- All the higher educated unemployed aged in between 22 and 54 years are more prone to exit to a short- term job than to exit in non-participation. When **status =2, long-term (re)employment,** higher educated unemployed aged in between 22 and 24 years are more likely to exit in non-participation than exit to a long-term job, compared with the reference age group. Therefore, young graduates are in the most disadvantaged position on the labor market in terms of long-term (re)employment. We do not have statistical significance for the difference between the 25-34 years age group and the reference category.
- Unemployed graduates from South-West Oltenia region are in the worst position regarding the (re)employment chances. Higher educated individuals living in Bucharest-Ilfov have the highest short-term exit to a job chance from all the regions of Romania, followed by the individuals living in the West region. The differences between short-term exit- to-a job probabilities are statistically significant. For the long-term (re)employment, the highest probability goes to Central region and North-West region, followed by the Bucharest-Ilfov region and West region. The regression coefficient is not statistically significant for the difference between South-East region and South-West Oltenia region.
- The regression coefficient for area of living variable is negative for both short-term and long term (re)employment, meaning that higher educated individuals from rural area are most likely to exit in non-participation than short-term or long-term unemployment compared with those living in urban area. The gap between rural

and urban area is statistically significant and higher in the case of long-term (re)employment than short-term (re)employment.

- Marital status does not have a statistically significant effect on short-term (re)employment probabilities of university graduates, but has a 10% statistically significant impact on long-term (re)employment for the difference in exit to a job probability between married individuals and divorced individuals.
- Receiving unemployment allowance has a highly significant effect on both short-term and long-term (re)employment probability. Higher educated individuals without unemployment allowance during their current spell are most prone to exit to a job on short-term or long-term than exit to non-participation, compared with those with unemployment allowance. However, the regression coefficient is probably overestimated since we do not have the names of unemployed and we couldn't eliminate the intra-personal correlation.
- Having a previous work experience led to a significantly increase of the (re)employment chances for higher educated individuals during the analyzed period. Interesting, the effect is higher for short-term exit to a job than for long-term (re)employment.
- The effect of health status appears to be significant only for short-term (re)employment. Higher educated individuals with a disability are more likely to exit in non-participation than sort-term job compared with those without a disability, as we expected. The effect of health status is difficult to estimate since the sample of registered unemployed with a disability is very small.
- Unfortunately we did not have information about the field of education of each registered graduated unemployed. An interesting subject for future research is the estimation of the effect of field of education and specialization on the (re)employment probability.

5. CONCLUSIONS

The purpose of this study was to estimate the effect of factors influencing (re)employment probability of long-term university graduates registered as unemployed at the National Agency of Romania. Since more recent data were unavailable to us at this moment, we used a nationally representative micro-data set of 144155 completed registered spells for the period 2009-2010. We created a variable named *"status"*, which was the endogenous variable of our study; we used multinomial logistic regression to estimate the effect of gender, age, region, marital status, area of living, unemployment allowance, previous work experience and disability on the (re)employment probability.

The results emphasize that higher education is a decreasing factor for the gap between men and women and between rural and urban area of Romania. Economic development of regions has a significant role on (re)employment chances too; the results suggest a presence of an imbalance between Western parts of Romania, Bucharest-Ilfov and the rest of regions in terms of unemployment duration and (re)employment probability. Probably this is also a sign for an intra-regional migration from less economically developed regions to more developed one. Also, the data show a very low development of self-employment in Romania. In the future we would like to

extend this analysis and investigate the effect of field of education, specialization and other variables to (re)employment probability of higher educated individuals.

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Appendix

Table no. 1. Explanations of endogenous and exogenous variables

Variables	Definition
Endogenous	
Duration of a registered unemployment spell	Difference between the first and last day of unemployment and is measured in days.
Status	Categorical variable 1- Short-term (re)employment, 2- Long-term (re)employment, 3- Non-participation
Explanatory	
Gender	Dummy variable, 0- women, 1- men
Age	[22-24], [24-34], [35-44], [45-54], [55-65]
Region of living	Categorical variable 1- North-East Region, 2 – West Region, 3- North-West Region, 4- Central Region, 5- South-East Region, 6- South-Muntenia, 7 – Bucharest-Ilfov Region and 8– South-West Oltenia Region
Area of living	Dummy variable, 0-rural, 1-urban
Marital status	Categorical variable 1-unknown status, 2- unmarried, 3-married, 4-widowed, 5-divorced
Unemployment allowance	Dummy variable, 0-without unemployment allowance during the current spell (UI), 1-with unemployment allowance during the curent spell (UI)
Previous work experience	Dummy variable, 0-without previous work experience, 1- with previous work experience
Disability	Dummy variable, 0-without disability, 1- with a disability

Table no. 5. Results of multinomial logistic regression analysis

Status		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
1	Intercept	-3.983	.496	64.591	1	.000			
	Women	-.067	.025	7.422	1	.006	.935	.891	.981
	Men	0b	.	.	0	.	.	.	.
	22-24	.462	.088	27.311	1	.000	1.587	1.335	1.887
	25-34	.559	.084	44.377	1	.000	1.748	1.483	2.061
	35-44	.532	.086	38.122	1	.000	1.702	1.438	2.015
	45-54	.299	.089	11.358	1	.001	1.349	1.133	1.605
	55-65	0b	.	.	0	.	.	.	.
	North-East	.114	.049	5.304	1	.021	1.121	1.017	1.235
	West	.576	.049	139.870	1	.000	1.779	1.617	1.957
	North-West	.320	.051	39.670	1	.000	1.377	1.247	1.521
	Central	.589	.049	146.960	1	.000	1.802	1.638	1.982
	South- East	.404	.051	62.203	1	.000	1.497	1.354	1.655
	South-Muntenia	.620	.049	161.142	1	.000	1.859	1.689	2.046
	Bucharest- Ilfov	.738	.051	210.100	1	.000	2.092	1.893	2.312
	South-West Oltenia	0b	.	.	0	.	.	.	.
	Rural	-.079	.032	5.913	1	.015	.924	.868	.985
	Urban	0b	.	.	0	.	.	.	.
	Unknown	.330	.286	1.336	1	.248	1.392	.795	2.437
	Unmarried	.244	.283	.743	1	.389	1.277	.733	2.225
	Married	.268	.282	.902	1	.342	1.308	.752	2.274
	Widowed	.336	.291	1.332	1	.249	1.400	.791	2.478
	Divorced	0b	.	.	0	.	.	.	.
	Without UI	22.047	.033	433822.133	1	.000	3.757E9	3.518E9	4.012E9
	With UI	0b	.	.	0	.	.	.	.
	Without experience	-.344	.033	105.761	1	.000	.709	.664	.757
	With experience	0b	.	.	0	.	.	.	.
	Without disability	.785	.400	3.846	1	.050	2.193	1.000	4.808
	With disability	0b	.	.	0	.	.	.	.
2	Intercept	-1.974	.337	34.408	1	.000			
	Women	-.073	.017	17.622	1	.000	.930	.898	.962
	Men	0b	.	.	0	.	.	.	.
	22-24	-.129	.057	5.049	1	.025	.879	.785	.984
	25-34	.052	.053	.964	1	.326	1.054	.949	1.169
	35-44	.142	.055	6.735	1	.009	1.153	1.035	1.283
	45-54	.296	.055	28.891	1	.000	1.345	1.207	1.498
	55-65	0b	.	.	0	.	.	.	.
	North-East	.203	.032	39.680	1	.000	1.225	1.150	1.305
	West	.233	.033	48.720	1	.000	1.263	1.183	1.348
	North-West	.336	.032	109.290	1	.000	1.400	1.314	1.491
	Central	.464	.032	213.734	1	.000	1.590	1.494	1.692
	South- East	-.035	.035	.975	1	.323	.966	.901	1.035
	South-Muntenia	.187	.034	29.986	1	.000	1.206	1.128	1.290

	Bucharest- Ilfov	.314	.036	74.878	1	.000	1.369	1.275	1.469
	South-West Oltenia	0b	.	.	0	.	.	.	.
	Rural	-.242	.023	107.212	1	.000	.785	.750	.822
	Urban	0b	.	.	0	.	.	.	.
	Unknown	.340	.179	3.604	1	.058	1.405	.989	1.995
	Unmarried	.222	.177	1.577	1	.209	1.249	.883	1.766
	Married	.325	.176	3.403	1	.065	1.384	.980	1.953
	Widowed	.259	.183	2.006	1	.157	1.295	.905	1.854
	Divorced	0b	.	.	0	.	.	.	.
	Without UI	22.320	.000	.	1	.	4.93E9	4.936E9	4.936E9
	With UI	0b	.	.	0	.	.	.	.
	Without experience	-.154	.024	42.213	1	.000	.857	.819	.898
	With experience	0b	.	.	0	.	.	.	.
	Without disability	.448	.283	2.505	1	.113	1.566	.899	2.728
	With disability	0b	.	.	0	.	.	.	.
a. The reference category is: 3.									
b. This parameter is set to zero because it is redundant.									