THE EFFECT OF EDUCATION ON INCIDENCE OF UNEMPLOYMENT, DURATION AND EXIT STATES IN ROMANIA AND HUNGARY

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Abstract

The aim of this research is to study how education affects the incidence of unemployment, unemployment duration and exit states in two post-communist countries, Romania and Hungary. Aggregate data regarding ILO unemployment rate and micro-data regarding registered unemployment spells are analyzed for both countries. The results show that education has a significant effect on the incidence, unemployment duration and different exit states of individuals.

Keywords: *education, unemployment rate, duration, exit states*

JEL classification: J64, J21

1. Introduction

The literature describes *education* as a major factor influencing the individuals' wages, incidence, unemployment duration and reemployment probabilities. However, while a high number of papers are devoted to investigate the relationship between education and wages, insufficient work has been done on analyzing the impact of education on incidence and duration of unemployment, on exit destinations and re-employment hazard of individuals, especially for the two analyzed countries. We will present a review of some papers that emphasized the association between education and the incidence and duration of unemployment. Nickell (1979) analyzed the relationship between education, incidence and duration of unemployment for

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U.K. individuals; his results showed that each additional year of schooling up to 12 years reduces the unemployment duration with 4%. Also, obtaining an ordinary level qualification led to a decrease of unemployment duration with 12 % for U.K. individuals. Mincer ((1991, a) and (1991, b)) analyzed the relationship between education and incidence and duration of unemployment for U.S. women and men. His results show that higher level of education reduces duration of unemployment and its incidence for both U.S. women and men. Kettunen (1997), using a Weibull duration model with discrete mixing distribution proved a strong effect of education on the duration of unemployment for Finland. Better educated individuals have a higher exit rate from unemployment; however, beyond the bachelor degree level the re-employment probability of these individuals is decreasing. An interesting result of Kettunen is that Finish unemployed with a master or a PhD degree have the lowest re-employment probability.

Grogan and van den Berg (1999) showed that highly skilled workers who lost a job in Russia during 1994-1996 have a lower duration and incidence of unemployment than their less educated compatriots. A higher level of education reduces the unemployment duration in Britain, Belgium and Ireland, while in Spain and Greece it does not seem to have a significant impact on reducing the unemployment duration (D'Agostino and Mealli, 2000). Using a single risk discrete hazard model, Wolbers (2000) analyzed the effect of education on the transition between employment and unemployment for Netherlands. The results prove that individuals with higher level of education have a lower probability to become unemployed than poor educated individuals; another interesting result is that unemployed individuals with qualifications have higher chances to regain employment than those without qualifications.

In the study of Ollikainen (2006), education appears as a variable with a strongly positive influence on the unemployment duration in Finland, especially for unemployed women. According to the studies conducted by Tansel and Tasci (2005), Kupets (2006), Nivorozhkin (2006), Borsic et all. (2009), the higher a person's educational level is, the more increase his/her probability of finding a job in Turkey, Ukraine, Sweden, Slovenia, Croatia and Austria. There are also studies that showed a negative association between education and re-employment probabilities (Stetsenko, 2003 for Kyiv) or no effect of education on re-employment probabilities (Löfmark, 2008, for Taganrog, Russia, Cheidvasser and Benitez-Silva, 2007 for Russia).

The aim of this research is to investigate how education affects the incidence of unemployment, unemployment duration and exit states in two post-communist economies, Romania and Hungary. There is a lack of empirical literature focused on the effect of education for incidence, unemployment duration and exit states for both analyzed countries. Earle and Pauna (1996) first investigated, beside the other aspects, the association between education and unemployment duration in Romania. Their results show that as a person's educational level increases, the unemployment leaving rate increases too. Dănăcică and Babucea A.G. (2007) analyzed the role of education for duration of unemployment in one county of Romania, Gorj. More recently, Ciuca and Matei (2010) examined the impact of education, gender and age on the unemployment duration for eight counties of Romania. Their results showed that the university graduate hasn't better re-employment hazard on the labor market than others educational groups in 2009. Moreover, their unemployment duration is even higher than subjects with a lower educational level. In a recent study we proved a significant association between education and unemployment duration for Romania (Dănăcică, 2013). The present research is a first attempt on focusing on the effect of education for the incidence of unemployment, duration and exit states in Romania and Hungary. There is to my knowledge no empirical analysis on this subject for both countries until now.

The rest of paper is organized as follows: section 2 presents the effect of education on the incidence of unemployment in Romania and Hungary, section 3 presents the effect of education on the unemployment spells and exit states and finally, section 4 contains the research conclusion.

2. Education and the incidence of unemployment in Romania and Hungary

In order to analyze a potential association between education and incidence of unemployment in Romania and Hungary we will focus first on the unemployment rate by level of education in both countries (table 1 and table 2 from the appendix). Unfortunately, for Romania we have data about the unemployment rate by level of education only for the period 2000-2010 and for Hungary only for the period 2008-2013. Even with these data restrictions we can notice differences between unemployment rate of different educational groups in both countries, but more pronounced for Hungary. If we look at the absolute number of ILO unemployed individuals who graduated

a university education in Romania we can notice a substantial increase, especially with the beginning of the economic crises (70425 persons in 2010, compared with 13790 in 1997). No other educational group has such an increased trend in Romania; of course we have to take account that the number of university graduates increased too. Same conclusion we can draw if we are looking at the ILO absolute number of unemployed who never worked, during 2000-2012 (table 3 from the appendix).

Analyzing the data for Hungary we can notice a significant difference between unemployment rate of higher educated population and the unemployment rate of medium and low educated population, and the difference is more pronounced for women.

3. The effect of education on the unemployment spells and exit states

Because of the lack of aggregate data about unemployment duration by level of education for both countries, we use micro-data provided by National Agency of Employment Romania and Hungarian National Employment Service to investigate the effect of education on unemployment duration and exit states. 765290 unemployment spells registered at the National Agency of Employment Romania in 2010 are analyzed to investigate the association between education, unemployment duration and exit destinations from unemployment (all the spells with an unknown level of education were removed from the sample). For Hungary we analyzed 174733 spells registered at the Hungarian National Employment Service in 2008 and with the end date in the same year (the Hungarian samples contains half of those aged in between 19-65-year old who registered at the Employment Office in 2008 and who were eligible for unemployment allowance until 31st December, 2008). These data are the most recent that we have at the time of this study.

Duration of an unemployment spell, the endogenous variable for both countries is calculated as the difference between first and last day of registered unemployment spell and is measured in days. Different individual characteristics like education, age, region of living, area of living, labor market history, marital status, the occupational code of the job looking for are the explanatory variables of our study and are presented in table 4 and table 5 from the appendix. Beside the most important explanatory variable, *education*, since we had information about other personal characteristics of unemployed, we decided to investigate the effect of each of these variables within each

educational group. For both countries, an unemployment spell ends when the individual is deactivated from the register of unemployed. Since we had the information about the reason of deactivation for each spell, we could investigate the effect of education not only for unemployment duration but for the different exit states too. For Romania we grouped all the 25 different reasons for deactivation in three exit states: deactivation due to (re)employment [1], deactivation due to the expiry of the legal period for unemployment benefits, deactivation due to non-participation on the Romanian labor market. For Hungary we grouped all the 12 different reasons of deactivation from registered unemployment in four exit states, as follows: exit from unemployment due to re-employment, 2- exit from unemployment due to involvement in active labor market programs (ALMP), 3- exit from unemployment due to expiry of eligibility for unemployment allowance support and 4- exit from unemployment in inactivity. We will use Cox proportional hazard model in a competing risks framework to analyze the effect of education on men and women unemployment spells and exit states for Romania and Hungary.

Before proceeding with the competing-risks analysis, we will present a non-parametric estimation of the survival time until (re)employment occurs, mean and median survival time until (re)employment occurs for both countries, with a focus on education. First we will analyze if education significantly impact the survival time until (re)employment in Romania and Hungary. Second, we will investigate if the effect of education on survival time until (re)employment is different for men and women, different age groups, different urban/rural area, and different history on the labor market.

In table 5 from the appendix we presented the mean and median survival time until (re)employment occurs estimated with the Kaplan-Meier product limit estimator for both countries. The differences between different educational groups are statistically significant for both Romania and Hungary (table 6 from the appendix). As a rule, we can notice that a high level of education led to shorter unemployment duration until (re)employment. However, for both countries individuals who graduated short-term university level (college) have shorter unemployment duration until (re)employment than individuals who graduated long-term university level.

[1] We used the term (re)employment because we have in the Romanian samples young individuals' fresh graduates without previous employment who can not find a job on the labor market and are registered as unemployed. The rest of individuals who found a job during the analyzed period are reemployed.

The effect of gender variable is significant only for the Hungarian sample. We can see that low and medium educated women have a longer survival time until (re)employment than low and medium educated men. But in the case of a higher education, the situation is reversing; higher educated women have shorter unemployment duration until they exit in (re)employment than men.

Age has a significant effect on unemployment spells and exit destinations for both countries (Dănăcică, 2013). We wanted to see how survival time until (re)employment for different educational groups is changing by the presence of the age variable, for both countries. Thus we estimated the mean survival time until (re)employment for three educational groups, very low educated individuals (primary education or none), medium education (high-school) and higher education (long-term university). Because for the first educational group, for both countries we got a blank space for the median survival time on the results table, we presented and used for comparison, instead of median survival time the mean survival time. The results are presented in table 8 from the appendix. Comparing the results we can notice that a young age is reducing the unemployment duration of all three analyzed educational group; however the decreased effect is higher for poor educated men and women in both countries. For medium educated individuals an age in between 25 and 34 years gives better chance to exit in (re)employment than an age in between 15 and 24 years. For Hungary the age effect is more pronounced. Very low educated individuals aged in between 19 and 24 years have a shorter mean survival time until (re)employment than medium educated individuals. And a higher age is increasing the duration of unemployment, however the effect is less pronounced for university graduated individuals. The effect of age seems to be stronger for women from both analyzed countries.

Since we already proved that area of living and history on the labor market has a significant effect on the unemployment duration (Dănăcică, 2013), we will analyze if education has a different impact within the group living in rural areas and the group living in urban area, and if education has a different impact on individuals with a previous work experience and without a previous work experience. Analyzing the results from table 9 we can notice that a medium and a higher education is reducing the gap between individuals living in rural areas and those living in urban areas, and the gap between individuals with a previous work experience and those without work experience. The results of the tests show that all these differences are statistically significant.

For the next step we used a semi-parametric Cox proportional hazard model in a competing risks framework to analyze the impact of education on unemployment spells and exit states in Romania and Hungary; the other impact factors are analyzed too, and all the explanatory variables are pooled together. The reference category is the first for education and the last category for all the other explanatory variables, for Romania, and first category for education and gender and last category for other variables for Hungary; the Enter method was selected and the SPSS 17.0 was used. The estimation of the effect of education and other explanatory variables on the unemployment spells and exit destinations is presented in table 10 for Romania and table 11 from Hungary, in the appendix. For the Romanian sample, since gender is not significant was not included in the analysis.

Based on the results of competing-risks analysis we can draw the following conclusions:

- *Education* has a significant effect on the unemployment duration and (re)employment hazard for both analyzed countries. For both countries the regression coefficients of all educational groups are positive when the event is (re)employment, meaning an increase of the exit to a job hazard when comparing with the reference category, poor educated individuals. Same conclusion we can draw if we graphically analyze the hazard function for education, for both countries (figure 1 and figure 2 from the appendix). For Hungary the effect of education is stronger. For Romanian, when we controlled only for education variable, individuals with a university level of education have the shortest survival time until (re)employment. However when all the variables are pulled together, individuals with a vocational school education have the highest hazard of exit to a job, higher than individuals with who graduated college or long-term university. If we check the confidence intervals we notice that only the difference between (re)employment hazard of individuals who graduated vocational school and those who graduated long-term university is significant from statistical point of view. Thus the exit to a job probability of an individual who graduated a vocational school is higher that the exit to a job probability of an individual who graduated a long-term university level, but it is the same with an individual who graduated college (short-term university level). Another interesting finding is that for both countries the hazard rate is higher for

individuals who graduated college than university; however the difference is statistically significant only for Romania. A higher education for women in Hungary gives a higher probability to exit in (re)employment than men. Poor educated individuals are most prone to exit from unemployment due to expiry of the legal period for receiving unemployment allowance or to exit in inactivity. For Hungary, individuals with a higher education have the highest hazard to exit from unemployment due to involvement in active labor market programs, compared with the other groups.

- *Gender* has a significant effect on Hungarian spells and exit destinations.
- Hungarian women have a 13% lower exit to a job rate than men; women are most prone to exit from unemployment due to involvement in active labor market program or in non-participation than men. Poor educated women have the longest survival time until (re)employment.
- *Age* has also a significant effect for unemployment spells in both countries. In Romania individuals aged in between 25 and 34 years old have the highest exit to a job rate, when comparing with the reference category. Young individuals, 15-14 years, are most prone to exit due to expiry of the legal period for UI or in non-participation; however, we think that is not only the effect of age, but it is also the effect of a poor education of these individuals. For Hungary, as younger an individuals is, as better is his/her chances of exit to a job. In both countries the (re)employment hazard is decreasing with the age increase. However the effect of age on unemployment duration and reemployment hazard is weak compared with the results obtained for other countries, due to the presence of a high percent of spells for young individuals. Interaction between age and education show that age has a strong effect on poor educated men and women reemployment hazard for both countries.
- *Region of residence* has also a significant effect on unemployment spells and exit destinations in both countries. Individuals living in West region and Bucharest have the shortest unemployment duration until (re)employment and the highest exit to a job rate. South West Oltenia region is the most disadvantaged in terms of unemployment duration and (re)employment probability. Every region of Romania has his own survival function, with a different behavior. An

interesting future topic of research is the analysis of regional disparities in terms of incidence, unemployment duration and (re)employment probability. For Hungary, the highest exit to a job rate is registered for the Central Transdanubia region for both men and women, and the most disadvantaged region is Northern Hungary. A higher education is reducing the gap between individuals living in different regions of both analyzed countries.

- *Urban or rural area* is another factor that significantly influence the unemployment duration and exit states. Unfortunately we did not have the same information for Hungary. For Romania, individuals from rural area have a lower (re)employment hazard than those lining in urban area. We introduced an interaction between education and rural/urban area and we noticed that a poor education is increasing the gap between rural and urban spells. At the opposite, a higher education is reducing the gap between urban and rural areas.
- In the previous study, for the 2008-2010 we found that a *previous work experience* gives better exit to a job chances. However, for the 2010 year we can notice that individuals without a previous work experience have a higher (re)employment hazard than the reference category. In fact, poor educated individuals without previous work experience have longer unemployment duration and a lower exit to a job rate; for medium or higher educated individuals we have the opposite situation. A potential coliniarity between explanatory variables can also influence this result.
- We tested the proportional hazard assumption for both countries, using the log-minus-log (LML) graph. The results shows that the assumption is not violated.

4. Conclusion

The aim of this research was to analyze how education affects the incidence of unemployment, unemployment spells and the exit states of individuals from two post-communist countries, Romania and Hungary. The results show that the ILO unemployment rate for individuals with a higher education is lower that those with a medium education or a low education in both countries; for Hungary the effect of education is more pronounced, especially for women. Education has a significant effect on the unemployment duration and exit states in both countries too. 765290 unemployment spells

registered at the National Agency of Employment Romania in 2010 and 174733 spells registered at the Hungarian National Employment Service in 2008 and with the end date in the same year were analyzed. The Hungarian sample contains half of those aged in between 19-65-year old who registered at the Employment Office in 2008 and who were eligible for unemployment allowance until 31st December, 2008. These data are the most recent that we have at the time of this study. The results show that poor educated individuals have a 80 days longer mean survival time until (re)employment in Romania and 65 days (women) and 61 days (men) in Hungary than individuals with a higher education (college). We also proved that education interacts with survival time and (re)employment hazard estimated for men and women (significant only in Hungary), different age groups, different regions, urban and rural area and labor market history. A higher education attenuates the disparities between men and women (Hungary), between regions, between urban and rural area and between individuals with and without previous work experience. An individual who graduated vocational school has a higher exit to a job hazard than a long-term university educated one in Romania, and the same exit to a job chance as a college educated one. Also we have to take account that in Romania a large number of higher educated individuals are employed on positions for medium educated individuals, with a salary below their education and skills. In Hungary a higher education gives better exit to a job hazard than any other educational group. Higher educated individuals have a higher probability to be involved in active labor market programs too. Poor educated individuals are most disadvantaged and need attention and special programs from policy makers in both countries.

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APPENDIX

Table 1: *Total ILO unemployment rate by educational level 2000-2010 in Romania*

Year	University education	Medium education	Low education
2000	3.5	9.1	4.1
2001	3.9	8.2	4.0
2002	4.7	9.6	7.1
2003	3.7	8.1	5.7
2004	3.8	8.8	8.2
2005	3.9	8.0	6.6
2006	3.8	7.8	7.6
2007	2.9	6.9	7.1
2008	2.7	6.0	7.1
2009	4.3	7.2	7.5
2010	5.4	8.3	6.1

** Source of data: National Institute of Statistics Romania*

Table 2: *ILO Unemployment rate by the highest educational level and gender, 2008-2013* in Hungary

Total							
Year	University	College	Other secondary school	Grammar school	Vocational and apprentice school	Primary (general) school	Less than 8 grades of primary school
2008	1.9	3.4	5.7	7.5	8.2	17.8	45.5
2009	2.5	4.9	7.3	8.7	11.1	22.6	42.0
2010	3.8	5.3	8.5	10.3	12.2	24.2	43.4
2011	3.4	5.1	8.6	10.5	12.2	23.8	49.9
2012	3.7	5.0	8.5	11.8	12.1	23.9	45.7
2013	3.0	4.7	8.2	10.0	11.3	23.3	40.9
Men							
Year	University	College	Other secondary school	Grammar school	Vocational and apprentice school	Primary (general) school	Less than 8 grades of primary school
2008	1.4	3.1	4.7	7.9	7.6	19.1	38.3
2009	2.7	4.7	7.3	9.1	10.6	24.1	41.0
2010	3.6	6.2	8.2	9.4	12.1	26.4	39.1
2011	3.5	5.0	8.0	9.0	12.0	24.3	44.3
2012	3.4	4.8	8.4	13.1	11.8	24.3	42.6
2013	2.8	4.3	7.8	10.0	10.7	24.2	39.6
Women							
Year	University	College	Other secondary school	Grammar school	Vocational and apprentice school	Primary (general) school	Less than 8 grades of primary school
2008	2.4	3.6	6.7	7.3	9.5	16.4	56.8
2009	2.3	5.0	7.4	8.4	12.4	21.0	43.2
2010	4.0	4.7	8.9	10.7	12.6	21.7	47.4
2011	3.3	5.2	9.2	11.4	12.6	23.1	55.6
2012	4.0	5.1	8.6	11.0	12.6	23.4	50.1
2013	3.2	5.0	8.6	10.0	12.8	22.1	42.5

** Source of data: Hungarian Central Statistical Office*

Table 3: *ILO number of unemployed who never worked by the highest educational level and gender, 2000-2012, Romania*

Total								
Year	Long-term university	Short-term university	Post-high-school	High-school	Vocational school	Gymnasium	Primary (1-4 years)	Without education
2000	10713	2522	7506	104003	60169	48925	10520	5729
2001	10713	2399	5151	85006	57350	48753	11480	5130
2002	19905	4917	7458	88686	73244	67489	16338	3845
2003	15547	4735	7016	68831	62104	53677	12510	2480
2004	20626	4206	6490	88559	74938	77770	19434	7694
2005	19516	4533	6271	74379	63300	50953	12300	5047
2006	22834	6943	7017	78554	66156	65579	16186	6528
2007	19760	4939	4030	80086	63145	65350	17808	8932
2008	20177	3145	3559	70784	51309	64515	18259	11103
2009	22229	7392	3589	76405	46129	56124	19747	4188
2010	32526	9488	4901	90409	45723	49224	10886	4253
2011	-	-	-	108851	42987	52618	11733	3051
2012	-	-	-	112231	30826	51846	11642	2789
Men								
Year	Long-term university	Short-term university	Post-high-school	High-school	Vocational school	Gymnasium	Primary (1-4 years)	Without education
2000	5582	123	2410	51251	43956	27166	7266	3522
2001	5168	1052	1270	38083	37537	29920	8209	3242
2002	7636	2306	2092	38264	46232	41197	9254	1920
2003	7931	2860	3067	33262	36664	31163	7534	1246
2004	8225	1592	1880	42941	50613	49731	14554	5755
2005	8256	2109	1491	39948	42360	30480	9628	3882
2006	9371	2815	2926	39866	43230	41143	11558	5026
2007	8767	2028	2238	44606	41363	40924	12583	7277
2008	7592	1359	926	42707	34049	42151	13525	10133
2009	9147	2315	864	41909	32696	38306	13848	3574
2010	15280	2685	2126	48492	31707	29085	9003	2881
2011	-	-	1119	57558	29388	30222	9231	3051
2012	-	-	591	61768	21733	33736	8712	2185
Women								
Year	Long-term university	Short-term university	Post-high-school	High-school	Vocational school	Gymnasium	Primary (1-4 years)	Without education
2000	5131	2399	5096	52752	16212	21759	3254	2207
2001	7461	1348	3881	46924	19813	18833	3271	1888
2002	12269	2611	5365	50422	27012	26292	7085	1925
2003	7616	1875	3949	35570	25440	22514	4975	1234
2004	12401	2614	4610	45619	24324	28039	4880	1938
2005	11261	2424	4780	34431	20940	20473	2672	1165
2006	13464	4128	4091	38688	22926	24436	4628	1502
2007	10992	2911	1792	35480	21781	24427	5225	1655
2008	12585	1786	2632	28078	17261	22364	4734	970
2009	13082	5077	2724	34496	13433	17818	5899	614
2010	17246	6803	2775	41917	14015	20139	1883	1372
2011	-	-	3009	51293	13599	22396	2502	-
2012	-	-	2522	50463	9094	18111	2930	604

** Source of data: National Institute of Statistics Romania*

Table 4: *Definitions of the explanatory variable for Romanian and Hungarian men and women*

Explanatory variables	*Definition*
Education	**Romania**
	Dummy variable with the following categories: 0-without education, primary education or incomplete gymnasium, 1-gymnasium, 2-apprenticeship complementary education, 3-vocational school, 4-theoretical high-school, 5-special education (for people with disability), 6-foremen school, 7-post-high-school, 8-short-term higher education (college) and 9- long-term university.
	Hungary
	Dummy variable with the following categories: 1- less than eight years of education, 2- completed primary school, 3- special vocational school, 4-vocational school, 5- general secondary school, 6-vocational secondary school, 7- technical school, 8- college and 9 – university.
Gender	Dummy variable with 0 for women and 1 for men- Romania
	Dummy variable with 1 for men and 2 for women- Hungary
Age	**Romania**
	Values in between [15-65 years], analyzed distinctively by the following intervals, [15-24], [25-34], [35-44], [45-54] and [55-65].
	Hungary
	Age was extracted from the year of birth information and its values are in between 22 and 64 years; age was divided in the econometrical analysis as follows: [22-24] years, [25-34], [35-44], [45-54], [55-64].
Region of living	**Romania**
	Dummy variable: 1- North-East Region, 2 - West Region, 3- North-West Region, 4- Central Region, 5- South-East Region, 6- South-Muntenia, 7 – Bucharst-Ilfov Region and 8 – South-West Oltenia Region,
	Hungary
	Dummy variable: 0- Budapest, 1- Northern Hungary, 2 - Northern Great Plain, 3- Southern Great Plain, 4- Central Hungary, 5- Central Transdanubia, 6- Western Transdanubia and 7- Southern Transdanubia.
Urban/Rural area of living (only for Romania)	0-individual lives in a rural area, 1- individuals lives in a urban area
Marital status (only for Romania)	Dummy-variable with 0-unknown marital status, 1 – unmarried, 2-married, 3- widowed, 4- divorced
Labor market history	0-if individuals do not have previous work experience, 1- if he/she has work experience
Occupational code (FEOR) of the job looking for variable	There are hundreds different codes in the Hungarian datasets. However, first digit of the codes has a particular meaning, as follows: if the occupational codes has the first digit code in between 1 and 4, it shows that the unemployed is looking for a white collar job (professional, managerial, or administrative work), and if the codes has the first digit in between 5 and 9, it shows that the unemployed is looking for a blue collar job (manual labor). In the analysis we put all the codes with the first digit in between 1 and 4 into category 1, and the other into category 2.

Table 5: *Estimation of the mean and median survival time until employment occurs by education in Romania and Hungry*

Education	Mean	Median
Romania		
Primary education or none	415.641	-
Gymnasium	332.136	421.000
Apprenticeship education	312.245	352.000
Vocational school	321.915	364.000
High-school	331.067	362.000
Special education	329.386	355.000
Foremen school	348.100	418.000
Post-high-school	318.617	352.000
College	300.823	342.000
Long-term university education	305.709	344.000
Total	335.633	388.000
Hungary		
Less than 8 grades of primary school	298.190	.
Completed primary school (8 grades)	270.315	.
Special vocational school	264.814	364.000
Vocational school	251.201	.
General secondary school	261.408	.
Vocational secondary school	253.430	.
Technical school	242.206	310.000
College	235.443	276.000
University	242.204	.
Total	256.796	.

Table 6: *Results of the Log-Rank, Breslow and Tarone-Ware tests*

Test	Chi-Square	df	*Significance*
Romania			
Log Rank (Mantel-Cox)	6715.057	9	.000
Breslow (Generalized Wilcoxon)	5908.212	9	.000
Tarone-Ware	5964.448	9	.000
Hungary			
Log Rank (Mantel-Cox)	730.965	8	.000
Breslow (Generalized Wilcoxon)	681.656	8	.000
Tarone-Ware	729.571	8	.000

Table 7: *Estimation of the mean and median survival time until employment occurs by education and gender in Hungary*

Education	Women		Men	
	Mean	Median	Mean	Median
Hungary				
Less than 8 grades of primary school	299.300	-	297.385	-
Completed primary school (8 grades)	279.100	-	261.030	-
Special vocational school	266.354	364.000	261.985	-
Vocational school	261.457	-	245.964	-
General secondary school	263.669	-	255.277	-
Vocational secondary school	257.336	-	247.359	316.000
Technical school	243.575	347.000	241.015	303.000
College	234.779	276.000	236.747	289.000
University	238.846	275.000	246.175	-
Total	262.779	-	251.161	-

Table 8: *Mean survival time until (re)employment occurs in Romania and Hungary by educational level and age*

Age	Education		
	Very low education	Medium education	University
Romania			
15-24	398.575	297.104	255.846
25-34	412.463	283.005	268.087
35-44	424.407	332.868	325.569
45-54	415.430	338.334	334.706
55-65	427.620	363.475	333.796
Hungary			
19-24	159.607	231.744	104.919
25-34	270.865	249.606	208.683
35-44	298.050	247.590	259.294
45-54	302.980	250.821	267.708
55-64	301.413	280.296	300.209

Table 9: *Mean survival time until (re)employment occurs in Romania by educational level area of living (urban/rural) and history on the labor market*

Variable	Education		
	Very low education	Medium education	University
Romania			
Rural	429.682	342.574	308.926
Urban	377.240	324.562	304.389
Without experience	432.275	284.540	249.024
With experience	377.337	370.091	335.454

Table 10: *Variable estimation for different exit states. Romania*

Explanatory variables	Exit states					
	(Re)Employment		Expiry of legal period for UI		Non-participation	
	B	*Exp(B)*	*B*	*Exp(B)*	*B*	*Exp(B)*
15-24	.285	1.330***	2.167	8.736***	1.510	4.527***
25-34	.778	2.177***	1.340	3.820***	.006	1.006***
35-44	.418	1.519***	.433	1.542***	-1.551	.212***
45-54	.292	1.340***	.070	1.073***	-1.107	.331***
55-65	Reference category					
Primary education or none	Reference category					
Gymnasium	1.224	3.401***	.690	1.994***	.862	2.368***
Apprenticeship education	1.373	3.946***	.736	2.088***	1.020	2.774***
Vocational school	1.451	4.269***	.582	1.789***	.883	2.418***
High-school	1.239	3.451***	.944	2.571***	1.387	4.002***
Special education	.970	2.639***	1.385	3.994***	1.418	4.130***
Foremen school	1.338	3.813***	.534	1.706***	1.478	4.383***
Post-high-school	1.162	3.197***	.863	2.371***	1.438	4.211***
College	1.428	4.170***	.914	2.494***	1.440	4.222***
Long-term university education	1.212	3.362***	1.125	3.079***	1.441	4.223***
North-East	.401	1.494***	-.117	.889***	-.064	.938
West Region	.661	1.937***	-.217	.805***	.310	1.363
North-West	.108	1.114***	-.189	.828***	.093	1.098
Central Region	.109	1.115***	-.254	.776***	-.009	.991
South- East	.210	1.234***	-.062	.940***	-.088	.915
South-Muntenia	.253	1.288***	-.166	.847***	-.027	.973
Bucharest-Ilfov	.426	1.532***	-.399	.671***	-.257	.774
South-West Region	Reference category					
Rural	-.381	.683***	.174	1.191***	-.166	.847
Urban	Reference category					
Unmarried	.567	1.763***	-.072	.930	-.250	.779**
Married	.153	1.165***	.104	1.109	-.475	.622***
Widowers	.296	1.344***	-.061	.941	.040	1.041
Divorced	Reference category					
Without work experience	1.022	2.777***	-1.325	.266***	-.976	.377***
With work experience	Reference category					

*/**/***/significant at 10%/5%/1% level

Table 11: *Variable estimation for different exit states. Hungary*

Explanatory variables	Exit states							
	(Re)Employment		ALMP		Expiry of legal period for UI		Non-participation	
	B	*Exp(B)*	*B*	*Exp(B)*	*B*	*Exp(B)*	*B*	*Exp(B)*
Men	Reference category							
Women	-.139	.870***	.221	1.247***	-.094	.911***	1.142	3.134***
19-24 years	.539	1.715***	.763	2.145***	.838	2.311***	-2.084	.124***
25- 34 years	.431	1.539***	.369	1.446***	.294	1.341***	-2.469	.085***
35-44 years	.381	1.463***	.417	1.518***	.225	1.252***	-3.838	.022***
45-54 years	.353	1.423***	.262	1.300***	.209	1.233***	-3.765	.023***
55- 64 years	Reference category							
Less than 8 grades of primary school	Reference category							
Completed primary school	.487	1.627***	.034	1.034	-.501	.606***	.141	1.267
Special vocational school	.540	1.715***	-.177	.838	-.668	.513***	.363	1.837
Vocational school	.701	2.015***	-.376	.687***	-.873	.418***	.260	1.228
General secondary school	.653	1.922***	.208	1.232	-.839	.432***	.298	1.450
Vocational secondary school	.713	2.039***	.075	1.078	-.945	.389***	.423	1.830
Technical school	.813	2.255***	-.135	.874	-.944	.389***	.509	2.973
College	.970	2.639***	.404	1.498**	-1.048	.351***	.853	2.465
University	.877	2.404***	.001	1.001	-1.095	.335***	.426	1.267
Budapest	-.082	.921***	-.151	.860*	-.424	.654***	.237	1.152
Northern Hungary	-.257	.774***	.328	1.388	-.033	.968***	.608	1.437**
Northern Great Plain	-.121	.886***	-.011	.989**	.043	1.044***	.206	1.297**
Southern Great Plain	-.026	.974	.170	1.185	-.157	.855***	.372	1.348***
Central Hungary	-.202	.817***	.055	1.057***	-.477	.621***	.604	1.526***
Central Transdanubia	.214	1.239***	.542	1.719***	-.278	.758***	1.090	1.663***
Western Transdanubia	Reference category							
White collar job	-.047	.955	.153	1.166***	-.111	.895***	.167	1.181
Blue collar job	Reference category							

*/**/***/significant at 10%/5%/1% level

Figure 1: *Hazard function for different educational groups. event (re)employment. Romania*

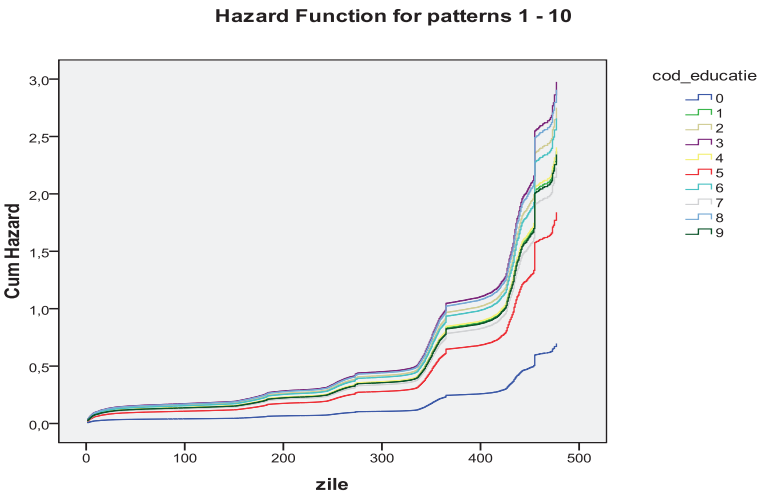

Figure 2: *Hazard function for different educational groups. event (re)employment. Hungary*