



UNEMPLOYMENT DURATION AND EXIT STATES OF DISABLED PEOPLE IN ROMANIA

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Abstract

Labor market insertion of disabled workers in Romania is considerably lower than those of workers with a normal health condition. The aim of our study was to focus only on the unemployment spells and exit states of disabled individuals. The empirical analysis is based on a micro-data set of 3335 completed unemployment spells of disabled subjects registered with the National Agency for Employment Romania. Using a non-parametric estimation of survival function and a semi-parametric Cox proportional hazard model in a competing risks framework we estimated the effect of different covariates (gender, age, education, urban/rural area of living, region of living, marital status, unemployment allowance, previous work experience and start year of spell) for the unemployment spells and exit destinations.

Keywords: hazard, survival, duration, model, disability

JEL Classification: J64, J21

1. Introduction

The disabled individuals form a social risk group. Often, they are subject to exclusion from the community life, and must face physical, organizational, economic and social barriers. Equal opportunities for people with disabilities, non-discrimination and improving life quality of these social risk categories were major concerns of international organizations in the last decades. In 1993, the United Nations adopted the Standard Rules of the Equalization of Opportunities for Persons with Disabilities. In 2006, the Convention on the Rights of Persons with Disabilities was adopted. Also, in 2003 the European Council issued the Malaga Declaration, with the main goal of improving quality of life for people with disabilities and in September 2006 launched

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the Action Plan 2006-2015 for promoting the rights and full participation of disabled people in society.

Despite all these efforts and the recent decades of economic growth and development, the employment of disabled people was not improved as much as these organizations wanted and expected. On the contrary, the participation of disabled people decreased as compared to other social groups acting on the labor market. In a study published in 2009 by OECD it was showed that the labor market insertion of disabled people was low and these people were exposed to relative income poverty. This disturbing reality attracted the attention of economists and led in the last period to an increasing number of papers focused on labor market participation of disabled people.

There are not many papers in the economic literature particularly focused on unemployment duration of disabled individuals. Melkersson (1999) showed that the probability of finding a regular job is lower for unemployed individuals with psychological disabilities on the Swedish labor market. High-school education, university education and previous professional experience have been found to increase the hazard rate for regular employment. Disabled unemployed men have a higher probability to leave unemployment for regular employment than women, and a lower probability than women to leave the labor force. Orlando and Patrizio (2006) proved that enrolment spell duration, individual personal characteristics, preferences for working hours, residence of living and the availability to move in a different working area was affecting positively the disabled individuals' employability in Italy. Another important finding was that physically disabled individuals have a higher probability of being unemployed than other disabled individuals. Sciulli, Menezes and Vieira (2007) found that, despite specific employment programs, disabled individuals have lower reemployment chances than individuals with a normal health condition. The results of their study show that people with muscular, skeletal, geriatric and sensorial problems face the longest unemployment duration. Organic disabilities such as blindness, deafness or speech impairment significantly reduce the probability of finding a job, while the intellectual disabilities do not significantly influence the probability of employment.

More frequently, researchers focused on the labor market participation of disabled individuals. We can mention here the study of Bartel and Taubman (1979), in which they proved that having a disability reduces working hours of affected individuals and their probability of participating in the labor market. In another study published in 2004 they proved that individuals with a psychical disability have their individual earnings significantly reduced, and that in some cases this effect lasted as long as fifteen years. Kidd, Sloane and Ferko (2000) showed in their study the existence of significant disparities between healthy men and disabled men regarding wage and labor market participation rate in the UK. For the same country, Bell and Smith (2004) showed that in the last twenty years the number of disabled people increased, while the labor market participation of these people decreased. Their analysis emphasizes that the decline in the labor market participation was found almost exclusively among long-term disabled unskilled males. All these findings led McVicar (2004) to highlight the implication of spending public funds to combat the effects of social exclusion of disabled people.

Burchardt (2003) draws attention on the discrimination of employees with disability and the social exclusion that strikes mostly this category of people. Miranda (2003) emphasizes that the main reason of higher incidence of labor market non-participation among disabled people is not just the consequence of higher difficulties to find a job according to their specific features, but also a result of the physical barriers still existing in society, such as the access to public buildings and public transportation of disabled people. More recently, Parodi and Sciulli (2008) argued that, on the average, the households with disabled members have a lower income than the households without disabled members. The households with disabled members would be severely disadvantaged in the case of disability allowance turn-off. Another important result is that diffusion of poverty is higher among households with disabled members than among the households without members with disabilities; receiving disability allowance led to closing of income gap between households with disabled members and those without disabled members only for the lowest socioeconomic groups.

To our knowledge, there are no studies for Romania focused only on unemployment duration and exit destinations of disabled individuals. The study of Dănăcică (2013) shows, beside other results, that disabled individuals have longer duration of unemployment and lower hazard rate of exit to a job as compared with unemployed individuals with a normal health condition. Another study of the Romanian Academic Society (2009) was focused on the impediments of disabled individuals' employment. Thus, by analyzing for the first time the unemployment spells of disabled individuals and the factors influencing unemployment spells and exit states, this paper is an attempt to take a step towards understanding the needs of disabled unemployed individuals; and our paper seeks to fill a gap in the empirical literature, too.

The analysis is based on a micro-data set of 3335 completed unemployment spells of disabled individuals, registered with the National Agency for Employment Romania from 1st January 2008 to 31st December 2010. We allowed for three different exits from unemployment: (re)employment, ending of the legal period for receiving unemployment allowance and non-participation in the Romanian labor market. We wanted to analyze the unemployment spells and exit states of disabled individuals taking into account different disabilities (physical, cognitive, psychical, organic, etc.). As Sciulli, Menezes and Vieira (2007) underline, disabled individuals face common problems, but their disability type may affect differently the exits from unemployment and the reemployment hazard of these individuals. Unfortunately, we did not receive information regarding the type of disability for unemployed individuals; if we get this information in the future we shall extend the present study to a more thorough one.

The rest of the paper is organized as follows: the variables of the study are presented in section 2. Preliminary descriptive statistics are described in section 3. Methodological approach and empirical results follow in section 4. The paper ends with concluding remarks in section 4.

II. Variables of the Study

In our analysis, the endogenous variable, *duration of a registered unemployment spell*, was calculated as a difference between the first and last day of unemployment, and is

measured in days. The following explanatory variables are used in this study: *gender*, *age at the registration date*, *education*, *region of living*, *area (urban or rural) of living*, *marital status at the registration date*, *unemployment allowance*, *previous work experience before unemployment and start year of registered unemployment*.

The explanatory *gender* is introduced as a dummy variable, coded with 0 for women and 1 for men. The *age* has values between 16 and 62 years and was divided in the econometrical analysis into five intervals, as follows: 16-24 years, 25-34 years, 35-44 years, 45-54 years and 55-62 years. The *education* was received as a qualitative variable, with the following categories: without education, incomplete gymnasium, gymnasium, apprenticeship complementary education, professional school, theoretical high-school, vocational high-school, special education (for people with disability, compatible with theoretical high school in numbers of study years), foremen school, post-high-school, college, university and unknown level of education. In the econometrical analysis we coded education into nine groups. Individuals without education or with unfinished gymnasium were included in the same educational group (very low education group, less than eight years of schooling); individuals who graduated foremen school and individuals who graduated post-high-school were included in the same educational group, with a post-high-school education (we have only four cases for foremen school). We have the same situation for college (short-term university education), and long-term university education; all the individuals are analyzed together within the university education group (we had only nine cases for college).

We also analyzed the impact of *urban or rural area of living* for the registered unemployment spells and exit destinations of disabled people. The urban/rural area is introduced as a dummy variable coded with 0 for rural area and 1 for urban area. We had information about the county where unemployment individuals belong. However, since we could not estimate the survival function for all 41 counties and Bucharest, we introduced the explanatory *region of living*, with the following categories: North-East Region, that includes six counties - Iasi, Botosani, Neamt, Suceava, Bacău, Vaslui, West Region with four counties, Arad, Caraș-Severin, Hunedoara and Timiș, North-West Region, with six counties, Bihor, Bistrița-Năsăud, Cluj, Maramureș, Satu Mare and Sălaj, Central Region, with six counties, Alba, Sibiu, Mureș, Harghita, Covasna, Brașov, South-East Region, with six counties, Vrancea, Galați, Brăila, Tulcea, Buzău, Constanța, South-Muntenia, with seven counties, Prahova, Dâmbovița, Argeș, Ialomița, Călărași, Giurgiu, Teleorman, Bucharest-Ilfov Region, which includes the capital Bucharest and Ilfov county, and South-West Oltenia Region, with five counties, Mehedinți, Gorj, Vâlcea, Olt and Dolj. The *marital status* explanatory variable has the following categories: unmarried, married, widowed and divorced individuals. The *unemployment allowance* explanatory variable is introduced as a dummy variable, since we had only information about whether a subject has received unemployment allowance during his/her current spell or not (0 if not, 1 if he/she received benefits). The same situation occurred for the *previous work experience* explanatory variable introduced as a dummy variable (0 - no experience, 1 - if individual had previous work experience). To analyze the effect of financial crisis on the unemployment spells of disabled people we introduced in the econometrical analysis *the start year of unemployment* as an explanatory variable.

An unemployment spell ends when the individual is deactivated from the register of the unemployed. For every registered unemployment spell we had information regarding the reason for deactivation. There are 18 different reasons for deactivation (end of spell) in our sample. Having this information in hand, we could discriminate between different types of end states. We divided the end states into three main categories: 1 - (re)employment³ (short-term, less than twelve months, and long-term, more than twelve months), 2 – ending of the legal period for receiving unemployment allowance and 3 - non-participation in the Romanian labor market (inactivity due to retirement because of invalidity, inability to work, going abroad, maternity leave, if an individual does not appear at the Agency for Employment at the established term, retirement, suspended individuals during the compensation period, exit from unemployment due to the unjustified rejection to take a job at less than 50 km from home, exit from unemployment due to the unjustified refusal to attend active labor market programs or due to enrollment into a new educational level, etc.). We created the “ending of the legal period for receiving unemployment allowance” end state since 29% of the analyzed spells have this mention as a reason of deactivation (end of spell) and we do not know what happens to these individuals after deactivation.

We also have spells with unclear reason of end, such as “complete request without unemployment allowance”, “complete request with unemployment allowance”, and “accepted file with unemployment allowance”. We decided to right censor these spells due to the unclear exit destinations. Most of these spells belong to individuals registered as unemployed before the start date of the study period or to individuals who reached the maximum legal period for unemployment allowance. These spells are also a source of multiple spells for the same individual (due to the confidentiality law we did not receive the name of unemployed individuals). Censoring these spells, we avoid the intra-person correlation. Out of all 3335 analyzed spells, 25% had (re)employment as exit state, 29% ended due to ending of the legal period for receiving unemployment allowance, 2.5% exit into inactivity and 43.4% were right censored.

III. Preliminary Descriptive Statistics

The minimum duration of unemployment is 1 day and the maximum is 1128 days, with a mean of 186.01 days and a median of 182 days. Descriptive statistics and the corresponding histogram of unemployment spells are presented in Table 1 and Figure 1 of the Appendix. The distribution of the unemployment spells is right-skewed and leptokurtic.

Out of all 3335 registered spells, 43.7% are disabled women spells and 56.3% are disabled men spells. 24.74% of the total registered spells for women ended in (re)employment, as compared to 25.27% for men. Mean unemployment duration until (re)employment is 104.46 days for disabled women and 99.68 days for disabled men. We will check in the next section if these differences are statistically significant.

³ We used the (re)employment term due to the presence of young disabled graduates, without previous work experience on the occasion of their first employment experience. The rest of individuals who found a job are reemployed.

The distribution of the registered unemployment spells of disabled individuals by age has the following structure: 49.7% for the 16-24 years group, 28.8% for the 25-34 years group, 14.8% for 35-44 years group, 5.7% for 45-54 years group and 1.1% for 55-62 years group. Mean unemployment duration until (re)employment is 80.64 days for individuals aged between 16 and 24 years, 97.90 days for individuals aged between 25 and 34 years, 115.54 days for individuals aged between 35 and 44 years, 189.18 days for individuals aged between 45 and 54 years and 133.29 days for individuals aged between 55 and 62 years. We can easily notice a positive association between age and unemployment duration.

Figure 2 of the Appendix shows the distribution of analyzed unemployment spells by education. We can notice a high percent of disabled individuals with vocational school education, high-school education and apprenticeship complementary education. Uneducated individuals, or with poor education (maximum 8 years of schooling) represents 13.6% of the total analyzed spells. Higher-educated individuals represent 10% of the total analyzed spells. For the (re)employment state we have the following distribution: 10.1% for higher-education group, 35.8% for vocational school group, 13.4% for high-school group, 14% for gymnasium group, 3.9% for very low educated group (less than 8 years of schooling), 3.1% for post-high-school group, 8.5% for apprenticeship complementary education group and 3.7 for special education group.

The distribution of the analyzed spells by region of living is presented in Table 2 of the Appendix. We can notice a lower percentage of registered unemployment of disabled individuals for the Bucharest-Ilfov and West regions. 22.6% of the total analyzed spells belong to individuals living in rural area and 77.4% belong to individuals living in urban area. A potential explanation for the high urban/rural gap is that disabled individuals living in rural areas are not going to Employment Offices to register themselves due to their difficulties. According to a report of the Romanian Academic Society, the majority of the disabled people without a job live in the rural area or in small cities and their main income source is the indemnity for disabled individuals or the disability pension. 85% of them are not looking for a job and 56.2% never had a job. Mean duration of unemployment until (re)employment for rural spells is 80.88 days; for urban spell we found 107.52 days.

Out of all 3335 analyzed spells, 60.7% belong to individuals who did not receive unemployment allowance during their current spell, and 39.3% belong to individuals who got the unemployment allowance. Only 12.22% of the spells with unemployment allowance ended in (re)employment, as compared to 33.3% spells without unemployment allowance that ended in (re)employment. Mean unemployment duration for individuals without allowance is 56.58 days, as compared to 292.30 days for individuals who received unemployment allowance during their current spell. Out of all analyzed spells, 23.6% belong to individuals with a previous work experience before unemployment and 76.4% belong to individuals without previous work experience. The high rate of spells without previous work experience is due to the presence of a high number of young subjects in the sample. Most of them are young graduates, without previous work experience before their unemployment.

Table 3 of the Appendix presents the distribution of unemployment spells by registration year. The highest number of disabled unemployed was registered in 2009,

a consequence of economic crisis which began to be felt on the Romanian labor market. Mean unemployment duration until (re)employment was 72.57 days in 2008, 158.66 days in 2009 and 94.77 days in 2010. The longer unemployment duration until (re)employment registered for 2009 spells can be a consequence of the OUG No. 28/2009 regarding the implementation of a social protection measures for all the people dismissed due to the economic difficulties. For the 2010 year, we have to take into account that 31 December 2010 is the end of our study.

IV. Empirical Analysis

The empirical analysis of our paper is based on a non-parametric estimation of the survival function and semi-parametric Cox proportional hazard model in a competing risks framework.

IV.1. Non-parametric Estimation of Survival Function

First, as a visual aid, we use the Kaplan-Meier survival curves for every explanatory variable. However, due to the lack of space the curves are not presented in the Appendix. Median duration until (re)employment is 541 days, 91 days longer than the median survival time of unemployed with a normal health condition (Dănăcică, 2013). Median survival time until (re)employment is 678 days for disabled women and 541 days for disabled men. However, the results of all three tests, LongRank, Breslow and Tarone-Ware suggest a lack of statistical significance for the differences between disabled men and women during the analyzed period (Table 4 of the Appendix). All three above presented tests show a high statistical significance for the difference observed between survival times of the age groups. Except the case of the first age group, we can notice a positive association between the age of an individual and survival time until (re)employment. Individuals aged between 25 and 34 years are the most advantaged for exit towards employment, followed by the 35-44 years group. Disabled individuals aged between 16 and 24 years and between 55 and 62 years are the most vulnerable. Next, we investigate the impact of education on survival time until (re)employment. As we can notice, education has a highly significant effect on the survival time until (re)employment of disabled individuals. The shortest median survival time until (re)employment is registered for higher educated disabled individuals, followed by disabled individuals who graduated special education institutions; the longest median survival time until (re)employment is registered for theoretical high-school graduates and post-high-school graduates (Table 4 of the Appendix).

Regarding the potential disparities among the eight regions of Romania in terms of unemployment duration of disabled individuals, the results of the Long Rank, Tarone-Ware and Breslow tests suggest a lack of statistical significance. Thus, the region does not have a significant impact on survival time until (re)employment for disabled people. We have the same situation for urban and rural areas (Table 4 of the Appendix). In contrast, high significance is suggested by the above tests for the observed differences between disabled individuals who received unemployment allowance during their current spells and those who did not. Median survival time until

(re)employment is 29 days shorter for individuals who did not receive unemployment allowance during their current spell (Table 4). For previous work experience, the results of the tests suggest a high statistical significance (Table 4 of the Appendix). The median survival time until (re)employment is 194 days shorter for individuals with previous work experience on the labor market, as compared to those without work experience. The results of the Long Rank, Tarone-Ware and Breslow tests show that the marital status has a significant impact on the unemployment spells of disabled people. Another factor that is highly statistically significant for duration of unemployment is the start year of unemployment of disabled people. 2009 has the longest median survival time until (re)employment. The spells that started in 2009 were affected by the Government Ordinance OUG No. 28/2009 that caused an artificial increase in the unemployment duration. The shorter median duration of the 2010 spells was also a consequence of the end of study on 31st December.

IV.2. Semi-parametric Estimation of Hazard Function

Usually, the standard estimation method used in empirical analysis of unemployment duration is the semi-parametric Cox proportional hazard model. The canonical form is:

$$\lambda(t) = \lambda_0(t) \exp\{x'\beta\}$$

where: x' is the vector of the explanatory variables, included in the proportional hazard form, β is the vector of regression coefficients and $\lambda_0(t)$ is the baseline hazard. The function $\lambda(t)$, known as *hazard rate* in the literature, or the instantaneous failure rate, measures the instantaneous death rate of a subject at the time t , conditional on survival until the time t . High values of hazard function can be interpreted as a high risk event to occur for that subject. Particularizing to our study, if the duration of unemployment spells is measured in days, $\lambda(t)$ gives the probability that a subject who is still unemployed on the day t to be (re)employed, due to ending of the legal period for receiving unemployment allowance or to exit towards inactivity in the next day.

With the data in hand, we could distinguish between three destinations of potential exit from unemployment. Some empirical studies focused on the unemployment duration and its impact factors do not make a distinction between different destination states of exit from unemployment, this inattention leading to unrealistic employment chance of subjects (Gonzalo and Saarela, 2000, Eriksson, 1985). The standard single-risk model extended to two or more exit states is known in the literature as a competing-risks model (Lancaster, 1990). As Jensen&Westergaard-Nielsen (1990) pointed out, using a competing risks model led to an increase in the amount of information as compared to the single risk model; therefore, a competing risks model is a better option. Using a competing risks framework with flexible baseline hazard rates provides more robust results than those obtained from parametric approaches. With parametric models for unemployment duration the estimated effects of covariates can be biased due to a restrictive shape of hazard rate of unemployed subjects. The parametric Weibull model allows only for hazard rates that monotonically increase or decrease with unemployment duration.

In the case of a competing risks model, the probability of ending unemployment is given by the sum of two or more transition probabilities. A transition probability is defined in our study as the probability of going to one of the three above-mentioned potential end destinations. According to Narendranathan and Stewart (1989), the transition probabilities are estimated as a single risk by treating spells that end in other destinations as right censored spells.

The estimated effect of the explanatory variables on the unemployment spells is presented in Table 5 of the Appendix. In our analysis, the reference category is the last category for *gender, age, region, urban/rural area, unemployment allowance, previous work experience, marital status* and the first category for *education and start year of unemployment*; the Enter method was selected. When an explanatory variable is a numerical one, the hazard ratio is an estimate of the hazard function change for a unit increase in the p -th covariate. For the category variables, the coefficient provides the hazard ratio for a specific category compared with a reference category. Out of all 3335 analyzed spells, only 25% ended due to (re)employment; 29% exit from registered unemployment due to ending of the legal period for receiving unemployment allowance, being in fact still without a job at the end of our study. 2.5% of spells ended in non-participation on the Romanian labor market. For the unemployed with a normal health condition registered in the same period, the percent of finding a job is 33.8% (Dănăcică, 2013).

Analyzing the results presented in Table 5 we can notice that education, age (at 5% significance level), marital status, unemployment allowance and start year of registered unemployment have a significant effect on exit to a job rate. When the event is ending of registered unemployment due to the ending of the legal period for receiving unemployment allowance, beside the above variables, the region of living and previous work experience have also a significant effect. Previous work experience has a significant effect on median survival time only when we control just for this variable (see the Kaplan-Meier results). For the event ending of unemployment in non-participation, the start year of registered unemployment is the only explanatory variable that has a significant effect on unemployment spells.

All the four age groups have positive coefficients and higher than 1 hazard rate, which means an increase in the chance of exit to a job as compared to the reference category, the 55-62 years group. Disabled subjects aged between 25 and 34 year are in the better position on the labor market as compared to the other age groups. Vulnerable are disabled individuals aged between 55-62 years and young individuals aged between 15 and 24 years. Young individuals aged between 15 and 24 years are most prone to exit due to ending of the legal period for receiving unemployment allowance (meaning that they are still without a job at the end of this study). The difference between the 45-54 and 55-62 age groups are not statistically significant.

Education plays a significant role in improving the chance of disabled individuals to find a job. All levels of education have positive coefficients and higher than 1 hazard rates as compared to the reference category, very low educated disabled subjects. Disabled individuals with vocational school have the highest hazard rate for job finding, followed by higher-educated individuals. However, if we are looking at confidence intervals we can conclude that from statistical point of view they have the

same chances to exit to a job. High-school educated individuals have the lowest exit to a job rate; however, the difference between them and very low educated individuals is not statistically significant.

Disabled individuals who did not receive unemployment allowance during their current spell have an almost five time higher job finding rate than those who did receive unemployment allowance. The gap between UI and non-UI spells is higher in the case of disabled individuals than those with a normal health condition. Since all the spells with unemployment allowance ended due to ending of the legal period for receiving unemployment allowance and the majority of the spells ended in non-participation, we did not have this variable in the regression model for these two events. Disabled individuals without previous work experience have lower exit rate due to ending of legal period for receiving unemployment allowance than those with a previous work experience, as we expected.

As we can notice in Table 5, the hazard rate for all three events is sensitive to the entry year in registered unemployment. Both regression coefficients for 2009 and 2010 are negative, showing a decrease in the exit to a job rate, as compared to 2008. Individuals whose registered spell started in 2009 have a 51.2% lower exit to a job rate than those with their spell started in the reference year. Individuals with their spell started in 2010 are most prone to end unemployment by entering inactivity or due to ending of the legal period for receiving unemployment allowance, as compared to the reference category. The impact of economic crisis led to negative consequences for the Romanian labor market, and had a negative impact on disabled individuals' chances of finding a job.

V. Conclusion

Labor market opportunities of disabled workers in Romania are considerably lower than those of workers with a normal health condition. The aim of our study was to focus only on the unemployment spells and exit states of disabled individuals. Methodological approach is based on non-parametric estimation of the survival function and semi-parametric Cox proportional hazard model in a competing risks framework. For the empirical analysis, we used a micro-data set of 3335 completed unemployment spells of disabled subjects registered with the National Agency for Employment Romania during January 1st 2008 – December 31st 2010.

According to data provided by the National Authority for Disabled People, only 12.7% of disabled people who have the capacity to work were included in the Romanian labor market in 2009. From the population of disabled people that managed to find a job and work, only 50% succeed to keep that job. The most striking finding of our study is that the measures implemented by Romanian Government since 2005 to combat social exclusion and to improve employment chances of disabled individuals have been insufficient to solve the problems of this vulnerable group. Median survival time until (re)employment is significantly lower for an individual with a normal health condition as compared to median survival time until (re)employment of a disabled subject. A younger age and a very low education are worsening the situation of disabled individuals. Policies to reduce unemployment duration and to improve

employment chances should be targeted towards disabled people aged between 15 and 24 years and over 50 years. Also, policy makers have to increase the level of education of disabled people and to offer specializations suitable for individuals with specific health conditions. A higher education and an education focused on practical skills give a better chance on the Romanian labor market to the disabled subjects. However, disabled subjects did not have opportunities for education equal to those of individuals with a normal health condition. Moreover, very few of them have tried to compensate the poor access to a normal education by individual study and personal development. The incidence of non-schooling and early school-drop is seven, i.e. two times higher for the disabled individuals than for the individuals with a normal health condition. Moreover, the quality of education in special schools for disabled people or home-education is lower than normal education⁴. In fact, our study shows that graduating a special education for disabled people does not give a higher chance to find a job than other level of education.

Another factor with a significant effect on the job finding probability of disabled persons is the unemployment allowance. Disabled individuals who did not receive unemployment allowance during their current spell have an almost five time higher job finding rate than those who did receive unemployment allowance. Median survival time until (re)employment is 497 days for spells without unemployment allowance and 526 days for spells with unemployment allowance. The gap is even higher than in the case of healthy people. A potential explanation can be that, in the case of (re)employment, disabled individuals with I and II invalidity pensions have to give up totally their pension.

The job finding rate of disabled people is sensitive to the economic situation. Thus, Romanian policy makers have to focus their strategies on attenuating the effects of financial crises for disabled people, a very vulnerable group. The biggest problem for disabled people is the improper infrastructure, the difficulties of transportation to and from work, which is the main reason why many quit searching for a job or even quit their current job. Another big problem is that employers avoid hiring disabled people because they have to adapt the working conditions to the disabled people needs. Also, employers are concerned about the potential low productivity of disabled individuals hired and by the higher probability of work absence due to medical problems. Despite the Law 448/2006 which stipulates that an employer with more than 50 workers must have a 4% disabled people hired, the Romanian employers are unwilling to hire them. According to a study made by the Romanian Academic Society, 58% of the companies from the social economy structures do not have at least one disabled person hired; only 25% of these companies have between one and five disabled employees. 61% of the disabled individuals with a job are employed by private companies and 31% are employed by public companies or companies with majority state capital. The employment rate in companies specially designed for disabled people is very low, reaching only 1%.

⁴ *Romanian Academic Society (2009)*, Diagnostic: Excluded on the labor market, pp. 9, <http://www.motivation.ro/uploads/studii%20SAR/Diagnostic%20exclus%20de%20pe%20piata%20muncii.pdf>

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References

- Addison, J. and Portugal, P., 2003. *Unemployment duration: Competing and defective risks*. Available at: <<ftp://repec.iza.org/RePEc/Discussionpaper/dp350.pdf>>.
- Apostolache, M.A., 2007. Relația dintre mijloacele interne și cele internaționale de protecție a drepturilor omului, în *Tendențe contemporane ale dreptului european, Culegere de studii juridice*, Editura Cermaprint, București, pp.87-96.
- Bartel, A. and Taubman, P., 1979. Health and Labour Market Success: The Role of Various Diseases. *The Review of Economics and Statistics*, 59(1), pp.1-8.
- Bell, B. and Smith, J.M., 2004. Health, Disability Insurance and Labour Force Participation. *Bank of England Working Paper* No. 218.
- Berkson, J., Gage, R.P., 1950. Calculation of Survival Rates for Cancer. *Proceedings of Staff Meetings of the Mayo Clinic*; 25, pp.270-286.
- Böheim, R. and Taylor, M. P., 2000). Unemployment Duration and Exit States in Britain. *CEPR Discussion Papers* 2500.
- Borsic, D. et al., 2009. Cox Regression Models for Unemployment Duration in Romania, Austria, Slovenia Croatia and Macedonia, *Romanian Journal of Economic Forecasting*, (2), pp. 81-104.
- Bound, J., and Burkhauser, R., 1999. Economic Analysis of Transfer Programs Targeted on People with Disabilities. In: O. Ashenfelter and D. Card (eds.), *Handbook of Labor Economics*, Vol. 3C. Elsevier Science, Amsterdam: North Holland.
- Burchardt, T., 2003. *Being and becoming: Social exclusion and the onset of disability*, Report prepared for the Joseph Rowntree Foundation. Available at: <<http://eprints.lse.ac.uk/28310/1/CASereport21.pdf>>.
- Ciuca, V. and Matei, M., 2010. Survival analysis for the unemployment duration, *Proceedings of the 5th WSEAS International Conference on Economy and Management Transformation*, 1, pp.354-359.
- Cutler, S.J. and Ederer, F., 1958. Maximum utilization of the life table method in analyzing survival. *J. Chronic Dis.* 8, pp.699-712.
- Danacica, D., 2013. Cercetări privind durata șomajului și probabilitatea (re)angajării, Editura Academiei Române, București.
- Earle, J.S. and Pauna, C., 1996. Incidence and duration of unemployment in Romania, *European Economic Review*, Elsevier, 40(3-5), pp. 829-837.

- Heckman, J. Stixrud, J. and Urzua, S., 2006. The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. *Journal of Labor Economics*, 24(3), pp.411-482.
- Jensen, P. and Svarer, M., 2003. Short- and Long Term Unemployment: How Do Temporary Layoffs Affect This Distinction? *Empirical Economics*, 28(1), pp.23-44.
- Kidd, M.P. Sloane, P.J. and Ferko, I., 2000. Disability and the labour market: An analysis of British males, *Journal of Health Economics*, 19(6), pp.961-81.
- Lewis, G. and Sloggett, A., 1998. Suicide, Deprivation, and Unemployment: Record Linkage Study, *British Medical Journal*, 317, pp.1283-1286.
- Melkersson, M., 1999. *Policy programmes only for a few? Participation in labour market programmes among Swedish disabled workers*. Available at: <<http://intra.ifau.se/upload/pdf/se/to2000/few2.pdf>>.
- McVicar, D., 2004. *Why have UK disability benefit rolls grown so much?* Mimeo, School of Management and Economics, Queens University Belfast.
- Mincer, J., 1991. Education and Unemployment, *NBER Working Paper* No. 3838.
- Miranda, H., 2003. Disability Management in the Netherlands. *Peer Review Programme of the European Employment Strategy*, Den Haag, The Netherlands 24-25th November 2003, Available at: <<http://pdf.mutual-learning-employment.net/>>.
- Moffitt, Robert A., 1999. New Developments in Econometric Methods for Labour Market Analysis. In: *Handbook of Labor Economics*, Eds. O. Ashenfelter and D. Card. Amsterdam: North Holland.
- Mortensen, D.T., 1986. Job search and labor market analysis. In: *Handbook of Labor Economics*, volume 2 of Handbook of Labor Economics, chapter 15, pp. 849–919.
- Narendranathan, W. and Stewart, M., 1993. Modelling the Probability of Leaving Unemployment: Competing Risks Models with Flexible Baseline Hazards. *Applied Statistics. Journal of the Royal Statistical Society Series C*, 42(1), pp.63-83.
- Nickell, S., 1979. The effect of unemployment and related benefits on the duration of unemployment, *Economic Journal*, 89, pp.34-49.
- Ollikainen, V., 2003. *The Determinants of Unemployment Duration by Gender in Finland*. Available at: <http://www.vatt.fi/file/vatt_publication_pdf/k316.pdf>.
- Orlando N. and M. Patrizio (2006. Il Collocamento Mirato dei Disabili: L'Applicazione della Legge 68/1999 nella Provincia Autonoma di Bolzano, in *Aspetti Socio-Economici della Disabilità: Atti del Convegno, Pescara Marzo 2006* (Eds. G. Parodi), Aracne, Roma.
- Parodi G. and Sciulli D., 2008. Disability in Italian Households: Income, Poverty and Labour Market Participation. *Applied Economics*, Vol. 40 issue 20: 2615-2630.

- Pencavel, J., 1986. Labour Supply of Men: A Survey. In: O. Ashenfelter & R. Layard, Eds. *Handbook of Labour Economics*, Vol. I. North-Holland: Amsterdam.
- Pike, M.C., 1966. Design and Analysis of Randomized Clinical Trials Requiring Prolonged Observation of Each Patient. *British Journal of Cancer* 1976; 34, pp.585-612.
- Romanian Academic Society, 2009. *Diagnostic: Excluz de pe piața muncii. Piedici în ocuparea persoanelor cu dizabilități în România*. Available at: <<http://www.motivation.ro/uploads/studii%20SAR/Diagnostic%20exclus%20de%20pe%20piata%20muncii.pdf>>.
- Sciulli, D. Menezes, A.G. and Vieira, J.C., 2007. Unemployment Duration and Disability: Evidence from Portugal. *IZA Discussion Paper Series*, No.3028.

Appendix

Table 1

Descriptive statistics for the duration of unemployment (days)

Central tendency	Mean	95 % confidence interval for mean	Median	Mode
	186.01	(181.33, 190.70)	182	184
Dispersion	St. deviation	Range		
	137.987	1127		
Skewness and kurtosis	Skewness	Kurtosis		
	1.211	3.342		

Table 2

Distribution of the analyzed spells by region of living

Region	Frequency	Percent
North-East	671	20.1
West	259	7.8
North-West	355	10.6
Central	478	14.3
South- East	532	16.0
South-Muntenia	471	14.1
Bucharest- Ilfov	233	7.0
South Oltenia	336	10.1
Total	3335	100.0

Table 3

Distribution of the analyzed spells by start year of registered unemployment

Year	Frequency	Percent
2008	1164	34.9
2009	1273	38.2
2010	898	26.9
Total	3335	100.0

Table 4
Median survival time (days) and statistical significance for different covariates

Variable	Mean survival time until (re)employment (days)	Median survival time until (re)employment (days)	Statistical significance					
			Log Rank	Breslow	Tarone-Ware			
Men	569	541	0.778	0.786	0.790			
Women	591	678						
16-24 years	570.402	691	0.000	0.000	0.000			
25-34 years	514.258	489						
35-44 years	548.062	497						
45-54 years	598.594	526						
55-62 years	481.601	-						
Less than 8 years of study	634.002	-				0.000	0.000	0.000
Gymnasium	527.259	497						
Apprenticeship complementary education	570.711	489						
Vocational sch.	486.808	496						
High-school	681.881	678						
Special educ.	401.234	429						
Post-high-sch.	509.639	679						
Higher educ.	329.854	427						
Unknown educ	638.711	-						
North-East	641.844	679	.320	.320	.310			
West	609.333	422						
North-West	434.199	430						
Central	447.620	489						
South- East	555.753	541						
South-Muntenia	528.115	721						
Bucharest- Ilfov	573.886	526						
South Oltenia	484.059	595						
Rural	508.736	541				.899	.595	.722
Urban	598.725	564						
Without UI	556.676	497	0.000	0.000	0.000			
With UI	524.244	526						
Without exper.	634.222	691	0.000	0.000	0.000			
With exper.	522.431	497						
Unknown	469.847	678	0.001	0.000	0.000			
Unmarried	647.772	691						
Married	460.992	456						
Divorced	502.544	461						
Widowed	638.222	-						
2008	532.652	564				0.000	0.000	0.000
2009	582.552	679						
2010	310.796	349						

Table 5

Results of the Cox proportional hazard model in a competing-risks framework

Variables	Exit destinations								
	(Re)Employment			Expiry legal period UI			Non-participation		
	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)
Gender		.754			.337			0.245	
Women	-.022	.754	.978	-.064	.337	.938	.269	.245	1.309
Men	Reference category								
Age		.028			0.000			0.000	
16-24	.710	.071	2.034	2.161	.000	8.681	.376	.552	1.456
25-34	.890	.022	2.434	.861	.016	2.365	-1.305	.030	.271
35-44	.807	.038	2.242	.362	.313	1.436	-1.544	.007	.214
45-54	.597	.140	1.817				-.424	.419	.654
55-62	Reference category								
Education		0.000			0.000			0.104	
Less than 8 years of study	Reference category								
Gymnasium	.628	.002	1.874	1.063	.004	2.895	.800	.495	2.225
Apprenticeship complementary education	.464	.032	1.591	1.954	.000	7.059	2.323	.031	10.210
Vocational school	.791	.000	2.206	1.538	.000	4.656	2.059	.051	7.836
High-school	.144	.479	1.154	1.500	.000	4.483	2.481	.018	11.958
Special education	.530	.038	1.700	2.296	.000	9.932	2.385	.032	10.864
Post-high-school	.465	.084	1.592	2.030	.000	7.617	-5.266	.819	.005
University education	.681	.001	1.977	1.873	.000	6.505	1.940	.086	6.955
Unknown education	.397	.072	1.487	1.431	.000	4.182	-5.139	.756	.006
Region of living		.120			0.000			0.626	
North-East	-.215	.146	.807	.035	.784	1.035	-.425	.386	.654
West	-.102	.580	.903	.006	.966	1.006	.211	.679	1.235
North-West	.154	.314	1.167	.010	.948	1.010	.209	.677	1.233
Central	-.014	.927	.987	-.286	.055	.752	-.401	.448	.670
South-East	.122	.415	1.130	.154	.244	1.166	.210	.652	1.233
South-Muntenia	-.016	.915	.984	-.174	.250	.840	-.304	.557	.738
Bucharest- Ilfov	-.118	.489	.889	-.964	.000	.381	-.105	.832	.900
South Oltenia	-.215	.146	.807	.035	.784	1.035	-.425	.386	.654
Marital status		0.000			0.011			.786	
Unmarried	.565	.436	1.759	-.188	.763	.828	6.067	.894	431.307
Married	.462	.520	1.588	-.032	.958	.969	6.323	.890	557.069
Widowers	.902	.209	2.465	-.390	.518	.677	6.568	.885	712.115
Unknown status	.981	.193	2.668	-.694	.321	.500	5.508	.904	246.660
Divorced	Reference category								
	Rural/Urban area of living								
Rural	.048	.589	1.049	.115	.141	1.122	.349	.215	1.417
Urban	Reference category								
	Unemployment allowance during current spell								
Without UI	1.574	.000	4.825	-	-	-			
With UI	Reference category								

Variables	Exit destinations								
	(Re)Employment			Expiry legal period UI			Non-participation		
	B	Sig	Exp (B)	B	Sig	Exp (B)	B	Sig	Exp (B)
Previous work experience									
Without work experience	-.179	.111	.836	-1.044	.000	.352	-.372	.330	.689
With work experience	Reference category								
Entry year	.000			0.000			?		
2008	Reference category								
2009	-.716	.000	.488	-.271	.002	.763	.608	.054	1.837
2010	-.212	.020	.809	1.129	.000	3.093	1.567	.000	4.793

Figure 1

Histogram of the duration of unemployment spells for disabled people (days)

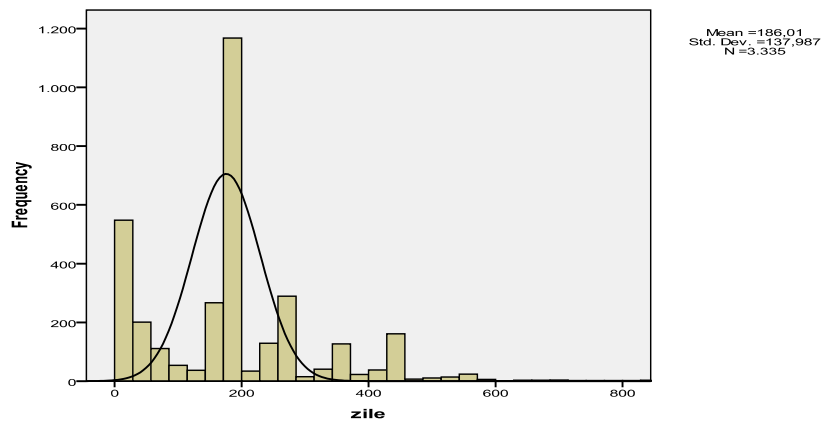


Figure 2

Distribution of analyzed unemployment spells by education (%)

