

GENDER DIFFERENCES IN EXIT RATES FROM UNEMPLOYMENT IN POLAND

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Abstract: The behaviour of women and men in the labour market is diverse. Traditionally, men have closer attachment to the labour market. Women, however, have more family responsibilities. In the paper, we analyse the exit rates from unemployment for each sex separately, and find out that the effects of the explanatory variables in estimated duration models depend upon gender. We begin our study with a single risk hazard model. These estimations are extended to a competing risks model with two destinations: employment and non-participation.

Keywords: gender differences, exit rates from unemployment, duration models, hazard

INTRODUCTION

Men and women behave differently in the labour market. Usually, men are more involved in the labour market, and women spend more time with family. It is thought that women have a weaker position in the labour market than men, especially these with young children. Women are often discriminated against even if their qualifications and job-search activity are higher than for men.

The literature, which refers to the study of gender inequality in the labour force participation or in wages, is extensive (e.g. [Altonji, Blank 1999] for a survey of these topics). However, studies that examine differences in the exit rates from unemployment are much rarer. Sex is an important variable affecting the movements between labour market states and it is a significant factor in determining the chances of finding a job. Some studies have shown that women are exposed to more frequent periods without work ([Steiner 1989], [Jensen, Westergaard-Nielsen 1990]), and have a lower probability of finding a new job [Katz, Meyer 1990b], especially on a permanent basis [Edin 1989].

Numerous empirical research that study the exit rates from unemployment in Poland disregard the issue of gender behaviour in the labour market. Most of these studies do not consider that the effect of different factors may depend on gender. They point out that gender only shifts the dependent variable in econometric models and do not estimate separate equations for men and women (see [Landmesser 2008b], [Stolorz 2010]). The opposite approach was applied abroad by [Gonzalo and Saarela 2000] or [Tansel, Taşçi 2010] and for Poland by [Landmesser 2008a], who estimated separate hazard models for both sexes.

Our study focuses on a deeper examination of the differences in the exit rates by gender. In the paper, we analyze the flows between labour market states and estimate duration models for the probability of leaving unemployment. We investigate the exit rates from unemployment for each sex separately and find out that the effects of the explanatory variables in estimated duration models depend on gender. We start our study with a single risk hazard model. These estimations are extended to a competing risks model with two destinations: employment and non-participation.

DATABASE USED IN THE STUDY

The empirical research is based on data from the Labour Force Survey in Poland (LFS) in 2008. The survey focuses on the situation of population from the viewpoint of economic activity of people, i.e. the fact of being employed, unemployed or economically inactive during the reference week. Based on the retrospective questions in LFS-questionnaire we can specify how long a person is unemployed or how long he was unemployed and whether the exit was to the employment or to non-participation (“out-of-labour-force”-state).

Six mini panels were created for the study, each of them included two neighbouring quarters. Of all people involved in the LFS in 2008 only those that were in the samples 35, 36, 37, 39, 40 and 41 were selected. In the next step, from the sample individuals who were not unemployed because they either worked or were inactive were removed. We chose only observations for people of working age. In this way the whole LFS-sample has been limited to a subsample of 2639 persons aged 18-65, who are or were unemployed at least for one month. At the end of the study, these people were either employed (377 persons) or out-of-labour-force (229) (economically inactive) or still classified as unemployed (2033).

Table 1. Distribution of unemployment spells by destination and gender

Gender	Destination			Total
	Censored	Employment	Non-participation	
Male	984 (77.1%)	205 (16.1%)	87 (6.8%)	1276 (100%)
Female	1049 (77.0%)	172 (12.6%)	142 (10.4%)	1363 (100%)

Source: own calculations

The unemployment spells ended due to employment are 16.1% for men and 12.6% for women, while those in the case of transition into OLF-state are 6.8% and 10.4% respectively. (Table 1). The individual unemployment duration (in months) for each person built a variable *duration* (T). The mean unemployment duration is 12.19 months for uncensored spells and 15.06 months for censored spells. For men, the average duration of unemployment is 12 months for spells that ended due to employment, whereas it is 11.01 months for those who completed due to the lack of participation. For the sample of women, the corresponding numbers are 9.36 and 16.62 months.

METHOD OF THE ANALYSIS

The variable we are interested in is the duration of time an individual spends in the unemployment state (T). An appropriate approach, which considers right censoring of unemployment spells, and which controls characteristics of individuals that influence the unemployment duration, is the use of hazard models [Lancaster 1979]. The survivor function gives the probability that the duration exceeds a moment t : $S(t) = \Pr[T > t] = 1 - F(t)$. $S(t)$ is the probability of surviving past t . Kaplan-Meier nonparametric estimate of survival function is given by $\hat{S}_j^{KM} = \prod_{k=1}^j \left(\frac{n_k - d_k}{n_k} \right)$, where n_k – number of individuals at risk at time t_k , d_k – number of failures at time t_k .

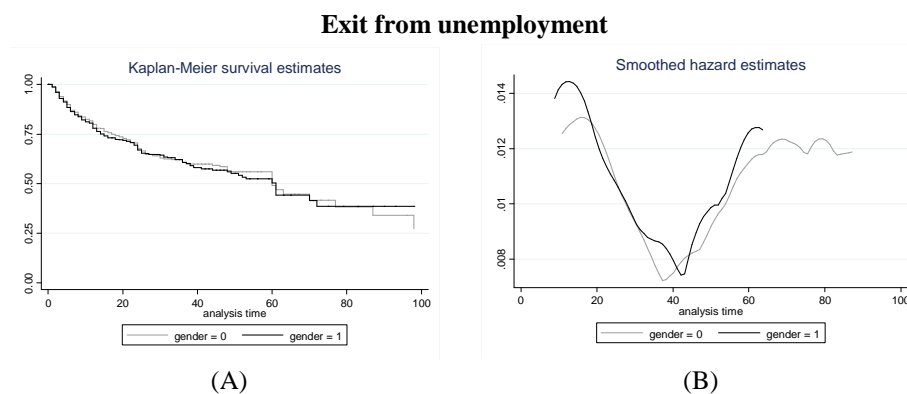
The most frequently applied demonstration of the duration period distribution is hazard function. The hazard function is the instantaneous probability of leaving a certain state conditional on survival to time t : $h(t) = \frac{f(t)}{S(t)} = \lim_{dt \rightarrow 0} \frac{\Pr[t \leq T < t+dt | T \geq t]}{dt}$. The hazard function $h(t)$ is the limit of probability that the spell is completed during the interval $[t, t+dt]$ given that it has not been completed before the time t , for $dt \rightarrow 0$. The hazard rates describe the intensity of transition from one state to another (for the theoretical backgrounds see [Kalbfleisch, Prentice 1980], [Cox, Oakes 1984]).

Hazard models usually comprise present duration of the phenomenon as a determinant for the probability of its occurrence and also other parameters. In the proportional hazard models, the conditional hazard rate $h(t|x)$ can be factored into separate functions: $h(t|x) = h_0(t) \exp(x'\beta)$, where $h_0(t)$ is called the baseline hazard, $\exp(x'\beta)$ is a function of explanatory variables vector \mathbf{x} . Cox's approach to the proportional hazard model is the semiparametric method of analysing the effect of covariates on the hazard rate [Cox 1972]. In the Cox model $h(t|x) = h_0(t) \exp(x'\beta)$ and the baseline hazard $h_0(t)$ is estimated non-parametrically.

RESULTS OF MODELS ESTIMATION

We begin with a descriptive analysis of the duration data. The first step is to plot the Kaplan-Meier survival curves for all exits from unemployment according to sex (Fig. 1A). The survival curves decline slowly. It shows that either women or men are more likely to remain unemployed.

Figure 1. Plots of the Kaplan-Meier survival curves and smoothed hazard functions for all exits from unemployment according to sex



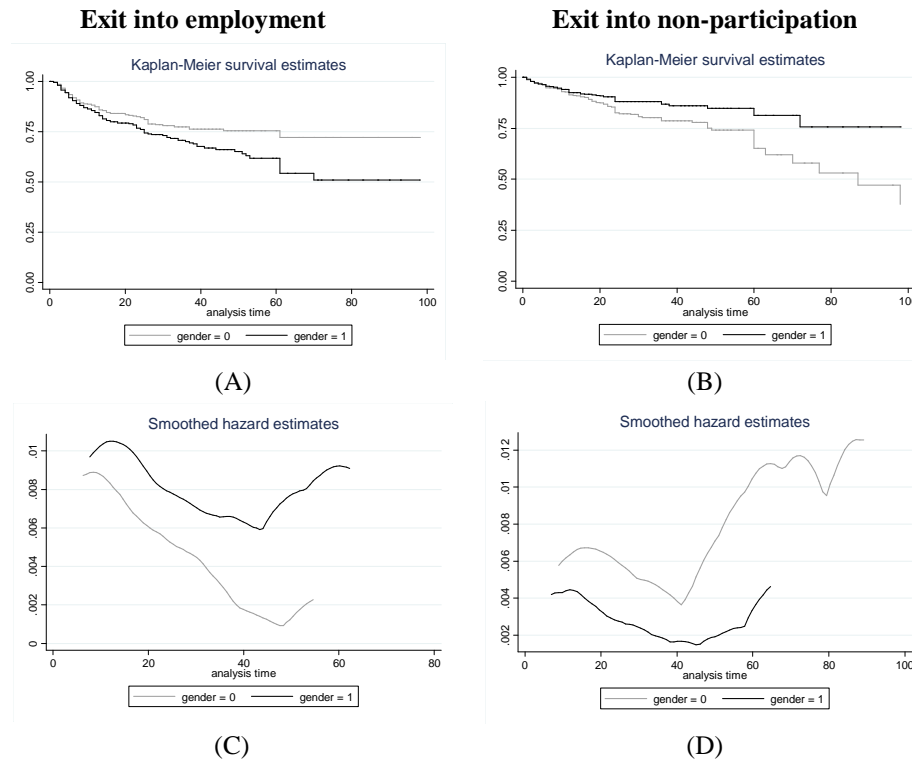
Source: own computations using Stata Statistical Software

In Figure 1B we plot the estimates of the hazard functions. The hazard of exit from unemployment first, declines rapidly and then, increases for both sexes in a similar manner. There is no difference between men and women.

In many situations, there are several possible risks of failure. The competing risks model formulation is applicable to modelling time in one state when the exit occurs to a number of competing states [Narendranathan, Stewart 1993]. Since determinants of the exit rate and their effects depend on the destination state, we distinguish between two possible destinations from unemployment: employment and non-participation (“out-of-labour-force”-state).

In Figure 2, we plot the survival functions for exits into employment and into OLF according to sex. Fig. 2A shows that in the case of exits into employment, women are more likely to remain unemployed than men. Fig. 2B shows that in the case of exits into OLF, men are more likely to remain unemployed than women. The results achieved from the Log-rank test for the equality of survivor functions confirmed the findings (p-values in the Log-rank test for equality of survivor functions are respectively 0.0317 and 0.0197). The variable gender does not distinguish in a statistically significant manner between survival function for exits from unemployment in any other state, but gender plays an important role for the exits in two separate states: a state of employment and OLF-state.

Figure 2. Plots of the Kaplan-Meier survival curves and smoothed hazard functions for exits from unemployment into employment and into non-participation according to sex



Source: own computations using Stata Statistical Software

The hazard of exit from unemployment into employment in the case of a man is greater than in the case of a woman (Fig. 2C). For women, we can observe a decreasing rate of the transition to employment as the episode duration increases. The negative duration dependence observed for women suggests that when the unemployment spell lengthens, employers penalise women by not offering a job. Thus, women have a lower attachment to the labour market than men.

The second destination considered while leaving from unemployment – the non-participation state – is associated with a completely different course of hazard functions (see Fig. 2D). The hazard of being economically inactive in the case of a man is smaller than in the case of a woman certainly due to the traditional role of a woman as a housekeeper. Unemployed women have a greater intensity of leaving workforce resources than unemployed men. The exit rates into non-participation first, decline and then, increase for both sexes. After fortieth month of unemployment, women seem to be more subject to a stronger positive duration dependence than men, regarding the exit rate into OLF-state. Since we use not so

many observations for individuals that went out of the labour market, we must be very careful with drawing conclusions regarding the duration dependence.

The results achieved of semiparametric Cox model estimation for exits from unemployment are presented in table 2.

Table 2. Cox regressions for exits from unemployment

Variable	Exit from unemployment		Exit into			
	Haz. Ratio	Std. Err.	employment		non-participation	
			Haz. Ratio	Std. Err.	Haz. Ratio	Std. Err.
gender (1=male)	1.107	0.095	1.453 ***	0.158	0.702 **	0.101
<i>Age-group</i> (Base age2534)						
age1824	1.539 ***	0.193	1.534 ***	0.235	1.554 **	0.344
age3544	0.734 ***	0.097	0.671 **	0.113	0.856	0.187
age4554	0.679 ***	0.089	0.613 ***	0.103	0.805	0.170
age5565	0.609 ***	0.100	0.485 ***	0.108	0.836	0.211
<i>Education level</i> (Base tertiary)						
vocational secondary	0.681 ***	0.101	0.593 ***	0.108	0.888	0.233
general secondary	0.745 *	0.130	0.720	0.153	0.838	0.260
basic vocational	0.692 ***	0.098	0.627 ***	0.107	0.858	0.219
lower second. or primary	0.598 ***	0.098	0.442 ***	0.091	0.984	0.273
head of the household	1.278 **	0.141	1.319 *	0.188	1.243	0.220
living with a partner	1.191 *	0.117	1.124	0.140	1.314 *	0.210
disabled	0.703 *	0.143	0.541 **	0.162	0.928	0.261
part time job	1.760 ***	0.381	0.859	0.330	3.252 ***	0.876
<i>No. of obs.</i>	2639		2639		2639	
<i>No. of failures</i>	606		377		229	
<i>lnL</i>	-4250.2		-2655.0		-1573.5	

*** Significant at 1%; ** Significant at 5%; * Significant at 1%.

Source: own computations using Stata Statistical Software

Variables included in x are socio-economic characteristics of the individual such as gender, age, education level. A competing risks model is assumed since there are two possible destinations. The transition probabilities are assumed to be independent, conditional on the explanatory variables. The transition probabilities for each destination can be considered as a hazard rate of each destination and can be estimated as a single risk by treating spells that finish into other destinations as right censored.

If we analyse the exits from unemployment into any other state, we find out that it does not persist a significant difference between unemployment durations of men and women. The hazard is not dependent on gender. But the hazard of exit into employment in the case of a man is 45.3% greater than in the case of a woman. The hazard of exit into non-participation in case of a man is 29.8% lower than in the case of a woman. The age coefficients imply that older people are at a disadvantage. The older age of the individual leads to a decrease of chance for exiting unemployment into employment. For exits into non-participation, age does not play a role. Higher education levels lead to a significant increase of opportunities to find a job, but the effects for exits into OLF are insignificant. Being the head of the family increases the chances of finding a job, but does not affect the exit into inactivity. Those who live in relationships are exposed to a higher risk of non-participation. Disability leads to a strong decline (46%) of the risk of exiting into employment. The effects for exits into OLF are moderate and insignificant. Looking for a part time job increases only the risk of being inactive.

Unfortunately, in the case of variable gender the estimated models for exits into employment or into non-participation violate the proportional hazard assumption. Therefore, there is a need to estimate separate models for men and women. In table 3 we present results of estimation of the exit rates from unemployment into employment for both sexes (we reduced models to the forms with fewer parameters, all of which are significant).

Table 3. Cox regressions for exits into employment for men and women separately

Variable	Exit into employment				
	Men			Women	
	Haz. Ratio	Std. Err.	Haz. Ratio	Std. Err.	
<i>Age</i>					
<i>age</i>	0.975 ***	0.006	0.856 ***	0.050	
<i>age^2</i>			1.002 **	0.001	
<i>Education level</i>					
tertiary	1.890 **	0.537			
secondary	1.438 *	0.324	0.685 *	0.145	
basic vocational	1.504 **	0.308	0.627 **	0.149	
lower second. or primary			0.553 *	0.168	
head of the household	1.518 **	0.276			
disabled	0.505 *	0.186			
full time job	1.298 *	0.189	1.671 ***	0.268	
<i>No. of observations</i>	1276		1363		
<i>No. of failures</i>	205		172		
<i>lnL</i>	-1278.1		-1109.7		

*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Source: own computations using Stata Statistical Software

As can be seen, the effects of the determinants of both exit rates differ between males and females. For men each additional year of age decreases the hazard of finding a job by 2.5%. The result is generally consistent with expectations, i.e. there is a positive relationship between age and the likelihood of being unemployed. The reason for that is lower productivity of older people, their higher wage demands, as well as discrimination against by employers. Young workers are those who have the highest exit rate into employment. In the case of women up until the age of 39 the relative hazard falls and, after that, it increases at an increasing rate (due to quadratic age as explanatory variable). As the hazard of exit into employment for women is lower than for men, gender differences in labour force participation decreases after the person's age of 39. The employment probability will be more equalized between men and women when women have passed their most fertile age. The effect of education is also different by gender. For men, any education level higher than primary or lower secondary is associated with a higher exit rate into employment. For women, lower than tertiary education levels lead to a significant decrease in opportunities to break unemployment and exit into unemployment. Being a head of the household increases only the men's chances to find a job. Disabled men are at the disadvantage on the labour market. Women who look for full time job have a higher intensity of transition into employment (by 25.1%) than those who look for a part time job. Such an effect for men is smaller but it is also statistically significant.

In table 4 results of estimation of the exit rates from unemployment into non-participation are presented for men and women separately.

Table 4. Cox regressions for exits into employment for men and women separately

Variable	Exit into non-participation				
	Men		Women		
	Haz. Ratio	Std. Err.	Haz. Ratio	Std. Err.	
<i>Age</i>					
<i>age</i>	0.825 ***	0.055	0.987 *		0.008
<i>age^2</i>	1.002 ***	0.001			
<i>part time job</i>	2.760 **	1.416	3.778 ***		1.145
<i>No. of observations</i>	1276		1363		
<i>No. of failures</i>	87		142		
<i>lnL</i>	-552.6		-867.4		

*** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Source: own computations using Stata Statistical Software

As can be seen, the effect of the age on exit rates into OLF-state differs between males and females. This time, the intensity of leaving the labour force decreases with age for women. For men, the exit rate first decreases, then increases with age (because the effect is quadratic in age). Given the always higher risk of being inactive for women, the gender difference tends to disappear as age

increases. In the case of transitions into non-participation state there is no statistically significant effect of education level, position in the family or disability, on the intensity of exit of unemployment. We have only found that women who look for a part time job have higher exit rate into OLF-state than men. However, we should remember that since we have estimated separate equations for each sex our results are not directly comparable when it comes to the strength of the impact.

RESUMEE

The aim of the research work was to analyse the exit rates from unemployment for men and women separately. Findings confirm the lower female involvement in the labor market and a higher female payoff from household responsibilities.

We also intended to investigate which factors influence the probability of leaving the unemployment state upon gender. Using the hazard models we estimated the impact of such personal characteristics of individuals such as age, education level, position in the family, disability on individual's unemployment period of men and women. The effects of explanatory variables differ between both sexes. The differences are due to the lower labour market attachment of women in the fertile age. In this period women are much more affected by the family related responsibilities than men. The results obtained show that drawing conclusions when gender differences are not considered can lead to misperceptions. Disregarding various exit states from the unemployment can also be misleading.

For women, the exit rate into employment is lower than in the case of men. There persists the negative duration dependence for women. However, the gender difference decreases after the age of about 40. The exit rate into non-participation state is higher for women than for men, but this difference also disappears as age increases.

The inequalities between sexes while leaving unemployment concern first of all people aged up to 40, that is people frequently with young children. Therefore, a more flexible family policy would probably help to reduce the effect of gender differences.

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