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Unemployment, Employment and Inactivity in Denmark: An Analysis of Event History Data

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ABSTRACT

In this paper I estimate a discrete time hazard model for the exits from the different labour market states - unemployment, employment and inactivity (or OLF) - in the Danish labour market.

I find that women and individuals over fifty are more likely to experience the long-term unemployment and inactivity. The less educated and unskilled workers are found to be another risk group to face the marginalisation from the labour market. Being previously employed reduces the risk of OLF, and increases the re-entry to employment probability, while living in the biggest Danish cities makes persons disadvantaged. These give the evidence that the 'Flexicurity' model makes the weakest individuals disadvantaged in the Danish labour market.

And finally, I find that those, who survived in a job one year, tend to remain employed, while persons, longer than one year inactive, face much higher risk of marginalisation.

Keywords: discrete time hazard model, labour market transitions, marginalisation

1. Introduction

This paper examines the flows between the three labour market states - unemployment (U), employment (E) and inactivity (OLF) - in Denmark in 1994-2003, and distinguishes the factors having an impact on the transitions above. The goal of the analysis is twofold: firstly, I capture the phenomenon of repeated unemployment by observing the exits from work to unemployment of previously unemployed individuals, and secondly, I tackle the issue of marginalisation in the labour market[1] by examining the risks of leaving a job or unemployment for OLF, and of remaining inactive.

Unemployment was high in Denmark during the 1980s and 90s, but since 1994 it decreased significantly as a result of the Danish 'Flexicurity'model (see e.g. Andersen & Svarer (2006))[2]. The reform in youth labour market policies (see Jensen et al. (2003)) resulted in a decline in the youth unemployment rate. The unemployment rate is defined as the proportion of the labour force (i.e. employed plus unemployed persons), which is unemployed, and this definition doesn't cover the individuals outside the labour force.

A survey of the labour market spells of 20-59 old individuals in a representative 1 per cent sample of the 16-70 year old Danish population in 1994 - 2003 (see Appendix tables A.1.1. - A.1.3.) leads to the result that 42.3% of employment spells of the persons, who in the previous spell were unemployed, end in

[1] Marginalisation means high individual rates of inactivity among persons of working age, who are not in education.

[2] 'Flexicurity' model consists of three elements: 1) flexible hiring and firing rules (flex-element), 2) fairly generous unemployment insurance system (security-element), and 3) Active Labour Market Policies (ALMPs), which are a fairly strict set of rules and regulations regarding availability for work, job search and participation in different programs.

new unemployment, while those in the previous spell inactive tend to return back into inactivity (47.3% of the spells). Thus, the 'Flexicurity' model besides the strengts has also some weaknesses: flexible firing rules and high minimum wages (implied by the generous income transfer schemes) can lead some workers (e.g. least skilled, least educated ones) to become disadvantaged in the labour market.

The present paper tackles the problem above by employing a set of the explanatory variables representing personal and geographical characteristics of the individuals, and their labour market history, and estimating their effect on the exits from unemployment, employment and inactivity in the Danish labour market.

A number of studies are focused on the transitions between labour market states. For example, Marston (1976) covers three labour market states - employment, unemployment and inactivity - in the US labour market, Meghir & Whitehouse (1997) model the transitions in and out of work for men over the age of 40 in the UK, Nilsen et al. (2000) examine transitions from employment among young Norwegians, while Djurdjevic (2003) tackles the question of re-entry to unemployment by studying the exits from different employment states and inactivity in Switzerland.

Rosholm (2001) applies a three-state dependent competing risks model to analyse marginalisation in the Danish labour market in 1981-1990, when the unemployment rate was mostly high. He covers the flows from unemployment, employment and inactivity of the three age groups of Danish youth, and finds the

high youth unemployment rate to be caused mainly by high transition rates into unemployment and inactivity, rather than low transition rates into employment.

In this paper I use the longitudinal register-based data and estimate a discrete time hazard model for the exit from the different labour market states: unemployment, employment and out of the labour force. The model was introduced by Jenkins (1995) and further developed by Lauer (2003) when she analysed the link between education and risk of becoming unemployed in a French-German comparison. The idea to use this modelling framework in the analysis of re-unemployment was implemented by Djurdjevic (2003) when she analysed the effect of unemployment on the subsequent employment history in Switzerland. Modelling the exit rate from unemployment, employment and inactivity leads to analyse how the transitions out of the states depend on duration. It also leads to analyse, which individuals are more likely to withdraw from the labour market after unemployment.

An important issue of the analysis is the experience of women, since they are considered to be a higher risk group. Lauzadyte & Rosholm (2006) found that the unemployment duration is 1.5 - 2 times longer for women than for men. Another question of interest is the impact on labour market experience of the individuals age. On the one hand, there is a demand side related to a danger for elderly workers to be disadvantaged in the labour market, on the other hand there can be a lack of motivation for those who are close to early retirement. Young individuals, however, also face a higher risk to drop out of the labour force (to complete education or because of personal reasons). It is

also important that another - much stricter - labour market policy is applicable to the youth (see Jensen et al. (2003)) while for those over 59 some special rules (in this case - much milder) are valid. Therefore I exclude from the analysis persons younger than 20 and older than 59, and focus on the transitions from unemployment, employment and OLF based on gender and age.

Estimations results show that women and elderly individuals face a higher risk to get outside the labour market and to experience higher survival in both unemployment and inactivity. I also find non-skilled and low-educated persons, and residents of the biggest Danish cities, where job competition is high, to be disadvantaged in the labour market, while being previously employed reduces the risk of OLF, and increases the re-entry to employment probability.

Another important finding is a break in the transition rates from employment and inactivity after 12 months spent there: those who survived in a job one year tend to remain employed, while persons longer than year inactive face a much higher risk of marginalisation from the labour market.

The structure of the paper is the following. Section 2 gives a brief literature review. Section 3 describes and presents the data set used in the study. The modelling framework is explained in Section 4. Section 5 presents and discusses estimation results and graphs the transitions from the labour market states based on gender and age, while Section 6 provides the concluding remarks.

2. A Brief Literature Review

While most of the existing research is focused on unemployment, a number of studies examine the other labour market states - employment and inactivity -

as well. As a pioneering contribution here I mention Marston (1976) who covers the three labour market states - employment, unemployment and inactivity - in the US labour market.

A number of studies on British data have also been carried out. For example, Meghir & Whitehouse (1997) model the transitions in and out of work for men over the age of 40 since 1968, and find an increase in earnings to delay job exit while an increase in social security benefits is found to delay return to work.

Bradley et al. (2003) run a competing risks model on British Household Panel Survey data of 1992–1997. They identify five states - high skilled employment, intermediate skilled employment, low skilled employment, unemployment and OLF - and discover the low skilled workers to be disadvantaged in the British labour market.

Cappellari & Jenkins (2004) examine the flows between unemployment, low-paid employment and high-paid employment for British men in 1991–2000 and find the low-paid men to be more likely to become unemployed than the high-paid ones (transitions from unemployment to low pay found to be associated with low qualifications), while Jones et al. (2005) model transitions between four different labour market states - payment at or below the National Minimum Wage (NMW), above the NMW, unemployment and inactivity - in 1999–2003.

Djurdjevic (2003) estimates a competing risks model to analyse the exits from the different labor market states - unemployment, employment characterized by either earnings losses, gains or relatively stable earnings, and OLF - in Switzerland (and find female, foreign and less skilled workers to experience

employment instability), while Nilsen et al. (2000) - examine the transitions from employment among young Norwegians (the individuals with high education, experience, and income are found to have significantly lower probabilities of job exits).

Bicakova (2005) focuses on the differences in earnings and labour force status of low-skilled men in France, the UK and the USA at the end of the 20th century. She discovers a sizable and significant effect of the wage on unemployment and inactivity in the UK and the US but none in France. The low-skilled in France are found to face a relatively similar risk of unemployment irrespective of their earning capacity, while in the UK and the US, unemployment found to be concentrated among the low-skilled at the very bottom of the wage distribution.

There are several notable Danish contributions within this topic as well. Rosholm (2001(2)) applies a three-state dependent competing risks model to analyse marginalisation in the Danish labour market in 1981-1990, when the unemployment rate was mostly high. He covers the flows from unemployment, employment and inactivity of the three age groups of Danish youth, and finds the high youth unemployment rate of that period to be caused mainly by high transition rates into unemployment and inactivity, rather than low transition rates into employment.

Blume et al. (2007) perform a competing risks analysis of the immigrant-native difference in transition patterns across labour market states for male immigrants based on the Danish register data. They distinguish between three labour market states - wage-employment, self-employment and non-employment

(incl. unemployment and OLF) - and find that a high proportion of immigrants from non-western countries tend to be marginalised from the labour market relative to natives, and tend to use self-employment to escape marginalisation.

The majority of the papers, however, cover the exits from unemployment, and here among others I want to mention van den Berg & van Ours (1999) and van den Berg et al. (2003) for France, Böheim & Taylor (2000) for Britain, Addison & Portugal (2003) for Portugal. A notable Danish contribution is Rosholm (2001(1)) who studies the variance of individual unemployment durations over the business cycle in Denmark.

Most of the studies, focused on the labour market transitions, adopt a competing risks model formulation with different possible destination states (since the factors, that influence the flows to different destination states, may differ) and use a multinomial logit approach (see among others Nilsen et al. (2000), Lauer (2003), Djurdjevic (2003), Jones et al. (2005)).

3. Description of the data set

I use the longitudinal register-based data set consisting of event histories for persons belonging to a representative 1 per cent sample of the 16-70 year aged Danish population. The event histories are based on monthly individual unemployment information and on the obligatory pension contributions made by the employers, and cover the period from January 1, 1985 to December 31, 2003. In the present study I cover the period from January 1, 1994 to December 31, 2003 because better quality data are available after the reform of Danish Active Labour Market Policies introduced in 1994.

The data is presented in a person-month format and we can distinquish four states occupied by the individual - employment (E), unemployment (U), recall (or temporary) unemployment (T) and inactivity (or out of the labour force (OLF)). According to UN's International Labour Office (ILO) definition a person is categorised as unemployed if he is out of work, available to work and actively searching for a job. The unemployment is defined as recall unemployment when the unemployed worker returns to the former employer during the first three months after becoming unemployed. In this paper I analyse only the unemployment spells that do not end with recall. Recall unemployment, and unemployment, shorter than 1 month, I merge with the employment spells. Employed persons are either employees, self-employed or assisting spouses, while OLF is the remaining category and includes retirement, maternity leave, education, housewife and other non-specified states out of the labour force.

Thus, there are three mutually excluding states: Employment (E), Unemployment (U) and Out of the labour force (OLF), and the the following transitions are examined: U-E, U-OLF, E-U, E-OLF, OLF-E and OLF-U.

In the analysis I use the flow sample. For each spell I observe the starting and ending dates, the state occupied and the destination state. Left-censored spells are problematic to handle (see e.g. Lancaster (1990) and Steiner (2001)). Thus, the first spells in the event history, which are left-censored, I exclude from the analysis.

Using the flow sample, however, does not give representative event histories - some individuals are excluded from the analysis. But the majority of the

excluded individuals belong to the employed ones (93 persons excluded as unemployed throughout the observation period, 10890 individuals - as employed, while 916 persons - as staying inactive), and this analysis is focused on the weaker persons, who face a risk of being disadvantaged in the labour market.

I also exclude from the analysis the individuals younger than 20 and older than 59 and create three age categories for the individuals older than 19 and younger than 30, for the 30-49 - aged and for those older than 50.

3.1. Sample composition

As Table 1 indicates, the non-censored unemployment spells in the sample last on average 6.5 months, while the average lenghts of the employment and OLF spells are 8.5 and 7 months.

Table 1: Sample composition

	Unemployment	**Employment**	**OLF**
Number of observations	**240985**	**636133**	**249172**
Number of individuals*	**5340**	**7581**	**4954**
Men	2517	3789	2155
Women	2823	3792	2799
Number of spells	**33942**	**44318**	**26271**
Right-censored spells, %	23,7	44,6	29,7
Non right-censored spells ending in			
Unemployment, %	-	56,3	33,8
Employment, %	79,9	-	66,2
OLF, %	20,1	43,7	-
Average lenght of spell (in months)**	**6,5**	**8,5**	**7,0**

* Number of people having unemployment, employment or OLF as their first spell

** Average lenght of non-censored spell

A large share (80%) of the non-right censored unemployment spells end in

employment while the rest end in OLF. Once employed, nearly half (45%) of the individuals tend to remain employed, but on the other hand many individuals move back into unemployment (56% of non-right censored and 31% of all employment spells) or drop out of the labour force. The majority of those, who entered into OLF, tend to get back into employment (66% of non-right censored spells) however almost 30% of the spells correspond to the individuals remaining out of the labour market.

Tables A.2. - A 3. in the Appendix cover the sample splits based on gender (Table A.2) and age groups (Table A.3.). Looking to gender differences I find unemployed women to have a higher risk of staying in that position or dropping out of the labour market. One fifth of unemployed men and more that one fourth of unemployed women remain in this state and only 15% of the non-right censored spells of men, but 25% of women end in the OLF. Once employed, the survival rate here is about 44% for both men and women, but from the transitions out of employment we discover that men are more likely to become unemployed, while women are more likely to leave the labour force. 70% of the men, but only 63% of the women transit from OLF back into employment. The average duration of non-censored unemployment and OLF spells for men are 1.3 and 0.7 months shorter than for women while the duration of the employment spell is half month longer.

Differences in the transitions among the age groups are bigger. After becoming employed the youngest age group (20-29 years old people) have lower survival probabilities, and face a higher risk to drop out of the labour market

(58% of the non-right censored employment spells). But on the other hand survival in unemployment and in OLF is also lowest for this age group. I discover that only 16% of 20-29 old unemployed persons stay in that state, while for the elderly (50-59 old) this figure comes up to 31%. However, the greatest differences exist in the case of OLF. Less that one fourth of the youths, one third of those in the middle age group and more than half of the elderly tend to remain out of the labour market. And 73% of the non-right censored OLF spells in 20-29 age group end in employment while for 50-59 age group this number comes up to only 53%.

Duration of employment spell doesn't vary between the 20-29 and 30-49 age groups, but is 2 months longer for the 50-59 years old. The unemployment spells, however, are longer for those older than 50 (by 4 months compared to the middle aged group and by 3 months compared to the youngest). The non-censored OLF spells are longest for the youths and shortest for those over fifty. This and the fact of the highest survival rates lead to the finding that once in inactivity, the 50-59 old individuals tend to exit from this state faster than their younger counterparts, but when time spent in OLF increases, they get disadvantaged in the labour market.

3.2. Explanatory variables

In the analysis I use a number of observable explanatory variables representing personal and geographical characteristics, and labour market history. The three age groups - *AGE20-29*, *AGE30-49* and *AGE50-59* - are distinquished, which represent the age of the persons in data set. *Female*, *Married* and *Immi-*

grant are the dummies for being women, married and immigrants (incl. 1^{st} and 2^{nd} generation). *Ch0_2*, *Ch3_6* and *Ch7_17* are the indicators for the age of the youngest child, the reference category having no children. *Edu11*, *Edu12*, *Edu14*, *Edu16* and *Edu18* represent the lenght of education completed - 10-11 years, 12 years, 13-14 years, 15-16 years and more than 16 years respectively. The reference here is 9 years or less (primary school education). *Experience* means work experience of an individual until the start of the spell while *Previous state* is a proxy for labour market attachement, taking the value 1 if the state in the previous spell was employment.

Indicators *Copenhagen*, *Aarhus*, *Odense* and *Aalborg* indicate place of residence, the reference category being "other place of residence".

I include a set of variables showing the UI fund membership: *UI FUND CONSTRUCTION, UI FUND MANUFACTURING, UI FUND TECHNICIANS, UI FUND TRADE, UI FUND CLERICAL, UI FUND ACADEMICS, OTHER UI FUND, and UI FUND SELF-EMPLOYED*. Some of UI funds exist based on the industry, while others are based on the educational achvievements of the members. For example, *UI FUND MANUFACTURING* mainly insures unskilled workers of the manufacturing industry, and *UI FUND ACADEMICS* covers UI funds, which insure academically educated workers.

4. Methodological framework

In this paper I estimate a discrete time hazard model for the exit from the different labour market states: unemployment, employment and out of the labour force. The idea of the hazard rate models (see, for example, Allison

(1982), Lancaster (1990)) is to divide the duration spent in a state into a number of time intervals and then to look to each interval whether an individual survived or exited the state. Since the data for this study is available in discrete time intervals - months, I choose a discrete time modelling framework.

I distinguish between different possible destination states and adopt a competing risks formulation, since the factors, that influence transitions to different destination states (for example, transitions from unemployment to employment and from unemployment to OLF), may differ, and following the tradition in the latest studies (see among others Nilsen et al. (2000), Lauer (2003), Djurdjevic (2003), Jones et al. (2005)) run a multinomial logit estimation.

To examine whether the modelling specification is appropriate I run a couple of specification tests. Firstly I apply the Wald tests for combining the states to test the hypothesis that some of the labour market states could be combined to make the modelling specification to be binomial rather than multinomial. Afterwards I use the Small Hsiao test (Small and Hsiao, 1985) to test the validity of Independence of Irrelevant Alternatives (IIA) assumption (the multinomial logit form is an adequate specification only if the IIA assumption is fulfilled). The hypotheses are tested on the specification without unobserved heterogeneity. I assume that if the alternatives are independent in this specification, then they are also independent in the less restrictive specification, which allows unobserved heterogeneity.

4.1. Model description

I use the modelling specification introduced by Jenkins (1995) and further developed by Lauer (2003) when she analysed the link between education and risk to become unemployed in a French-German comparison. The idea to use this model in the analysis of re-unemployment was implemented by Djurdjevic (2003) when she analysed the effect of unemployment on the subsequent employment history in Switzerland.

Let us assume the time spent by individual i in the s^{th} spell of state j to be expressed as T_{ij}^s. T_{ij}^s can be partitioned into a discrete number of intervals, I_t. In case transition or censoring occurs in interval I_t, we have $t = T_{ij}^s$. If the person survives in the state until the end of interval I_t, then $T_{ij}^s > t$. The set of the observed variables is covered by $x_{ij}(t)$ while ε_{ijk} represents the unobserved characteristics. The probability that person i moves from the state j to state k in the time interval I_t (given survival until beginning of I_t) is expressed by a destination-specific hazard rate and is defined as:

$$h_{ijk}^s(t|x_{ij}(t), \varepsilon_{ijk}) = Pr(T_{ij}^s = t, \delta_{ijk}^s = 1 | T_{ij}^s \geqslant t, x_{ij}(t), \varepsilon_{ijk}); \qquad (1)$$
$$i = 1, ..., N;\ t = 1, ..., T_{ij}^s;\ j, k = 1, ..., K.$$

Here δ_{ijk}^s means the transition indicator, which equals 1 if the s^{th} spell of individual i in state j ends in state k and 0 otherwise. Since the exit states are mutually exclusive, the probability of ending the s^{th} spell of state type j for any other state in interval I_t, can be expressed as:

$$H_{ij}^s(t|x_{ij}(t),\varepsilon_{ijk}) = Pr(T_{ij}^s = t|T_{ij}^s \geqslant t, x_{ij}(t),\varepsilon_{ijk})$$
$$= \sum_{k\neq j} h_{ijk}^s(t|x_{ij}(t),\varepsilon_{ijk}). \qquad (2)$$

The survivor function shows the unconditional probability that the person stays in the state j until the end of interval I_t and is defined as:

$$S_{ij}^s(t|x_{ij}(t),\varepsilon_{ijk}) = Pr(T_{ij}^s > t|x_{ij}(t),\varepsilon_{ijk}) = \prod_{z=1}^{t}(1-H_{ij}^s(z|x_{ij}(t),\varepsilon_{ijk})). \qquad (3)$$

And finally, the unconditional probability that individual i moves from his original state j to state k in interval I_t can be expressed by product of probabilities that he survives time interval I_{t-1} and that he leaves state j in interval I_t (given that he had survived until I_{t-1}):

$$p_{ijk}^s(t|x_{ij}(t),\varepsilon_{ijk}) = Pr(T_{ij}^s = t, k|x_{ijk}(t),\varepsilon_{ijk})$$
$$= h_{ijk}^s(t|x_{ij}(t),\varepsilon_{ijk})S_{ij}^s(t-1|x_{ij}(t-1),\varepsilon_{ijk}). \qquad (4)$$

Assuming that all spell observations, conditional on $x_{ij}(t)$ and ε_{ijk}, are independent, the likelihood function for the state j can be written as:

$$\mathcal{L}_j = \prod_{i=1}^{N}\prod_{s=1}^{S_i}\left[\prod_{k\neq j} p_{ijk}^s(T_{ij}^s)\right]^{\delta_{ijk}^s} S_{ij}^s(T_{ij}^s))^{\gamma_{ij}^s}. \qquad (5)$$

Here δ_{ijk}^s is the transition indicator defined above and γ_{ij}^s means the censoring indicator, which is equal to 1 if the sth spell of individual i in state j is censored and 0 otherwise (note that $\gamma_{ij}^s + \prod_{k\neq j}\delta_{ijk}^s = 1$).

Now we can introduce indicator y_{ijk}^s, which is equal to 1 when $\delta_{ijk}^s = 1$ and $t = T_{ij}^s$ (see Lauer, 2003) and express the likelihood function in the following way:

$$\mathcal{L}_j = \prod_{i=1}^{N} \prod_{s=1}^{S_i} \prod_{k \neq j}^{\Omega} \prod_{t=1}^{T_{ij}^s} h_{ijk}^s(t)^{y_{ijk}^s} \left(1 - \sum_{k \neq j}^{\Omega} h_{ijk}^s(t)\right)^{1 - \sum_{k \neq j}^{\Omega} y_{ijk}^s}. \qquad (6)$$

If we assume the hazard rate to have a multinomial logit form,

$$h_{ijk}^s(t|x_{ij}(t), \varepsilon_{ijk}) = \frac{\exp\left[\alpha_{jk}(t) + \beta'_{jk} x_{ij}(t) + \varepsilon_{ijk}\right]}{1 + \sum_{l \neq j} \exp\left[\alpha_{jl}(t) + \beta'_{jl} x_{ij}(t) + \varepsilon_{ijl}\right]}, \qquad (7)$$

equation (6) is a standard multinomial likelihood function, where y represent the transition indicators, and the censored observations enter the likelihood function as an additional state.

The term $\alpha_{jk}(t)$ represents the baseline hazard function, which shows the way the hazard rate depends on time. I choose the semi-parametric approach by assuming the baseline hazard function to be piecewise constant. (that is $\alpha_{jk}(t) = exp(\alpha_{jkm})$, $m = 1; ...; M_j$, where M_j is the number of intervals for baseline hazard). The following cut-off points for the intervals are used for all hazard rates (the unemployment, employment and OLF spells durations are all measured in months): 3, 6, 9, 12, 15, 18, 21, 24, 36, 60 and 84.

The x_{ij} represent the observed variables, which are assumed not to be determined by the future outcomes of the employment, unemployment and inactivity processes.

4.2. Unobserved heterogeneity

Unobserved heterogeneity ε_{ijk} is specified non-parametrically, using the mass point approach (see Heckman&Singer (1984)). There is assumed a discrete probability distribution for ε_{ijk}, i.e. that ε_{ijk} can be partitioned into a limited

number R of mass points or location parameters ε_{rjk}, $r \in \{1...R\}$, with a given probability $Pr(\varepsilon_{rjk})$. The following conditions are imposed on the mass points and their probabilities:

$$\sum_{r=1}^{R} Pr(\varepsilon_{rjk}) = 1$$
$$\sum_{r=1}^{R} Pr(\varepsilon_{rjk})\varepsilon_{rjk} = 0$$
$$E(\varepsilon_{rjk} x_{ij}(t)) = 0$$

Hence, the likelihood function (6) may be rewritten as:

$$\mathcal{L}_j =$$
$$\sum_{r=1}^{R} Pr(\varepsilon_{rjk}) \left[\prod_{i=1}^{N} \prod_{s=1}^{S_i} \prod_{k \neq j}^{\Omega} \prod_{t=1}^{T_{ij}^s} h_{ijk}^s \left(t | x_{ij}(t), \varepsilon_{rjk}\right)^{y_{ijk}^s} \left(1 - \sum_{k \neq j}^{\Omega} h_{ijk}^s(t | x_{ij}(t), \varepsilon_{rjk})\right)^{1 - \sum_{k \neq j}^{\Omega} y_{ijk}^s} \right].$$

5. Estimation results

This section covers the estimation results. The first sub-section presents the results of specification tests, related to the functional form of the hazard rate, while sub-sections 5.2. - 5.4. tackle transitions from unemployment, employment and OLF respectivelly.

5.1. Specification tests

To examine whether the modelling specification is appropriate I run a couple of specification tests (see Table 2). Firstly, I run the Wald tests for combining the states to make the modelling specification to be binomial. That is, I test the null hypothesis that the coefficients of two categories are not significantly

different from each other, and thus that the categories can be collapsed. A series of tests is applied for exits from unemployment, employment and OLF, and the hypothesis is rejected in all the cases (that is, the labour market states can't be combined).

Table2: Specification tests

Exit from Unemployment	χ_2	$P > \chi_2$
Wald test for combining states		
Combining Employment and OLF	5071,26	0,00
Combining Employment and Unemployment	8211,83	0,00
Combining OLF and Unemployment	2651,84	0,00
Small and Hsiao test for IIA		
Omitted: Employment	57,89	0,64
Omitted: OLF	31,47	0,91
Exit from Employment	χ_2	$P > \chi_2$
Wald test for combining states		
Combining Unemployment and OLF	4060,36	0,00
Combining Unemployment and Employment	8779,38	0,00
Combining OLF and Employment	7784,39	0,00
Small and Hsiao test for IIA		
Omitted: Unemployment	37,54	0,67
Omitted: OLF	60,05	0,35
Exit from OLF	χ_2	$P > \chi_2$
Wald test for combining states		
Combining Unemployment and Employment	5114,00	0,00
Combining Unemployment and OLF	6263,93	0,00
Combining Employment and OLF	7371,93	0,00
Small and Hsiao test for IIA		
Omitted: Unemployment	42,74	0,53
Omitted: Employment	79,25	0,11

Furthermore, the Small and Hsiao tests examine the hypothesis of Independence of Irrelevant Alternatives (IIA). If there exists any degree of substitutability among the labour market states, the IIA assumption is violated, and the multinomial logit specification is rejected. The results of the test lead to

the finding that the IIA is supported by the data for all the transitions tested.

Thus, the results of both specification tests indicate that the multinomial logit specification is appropriate.

5.2. Transitions from Unemployment

In this sub-section I present and discuss the estimation results of the factors having an impact on the transitions from unemployment to employment and to outside the labour force (the U-E and U-OLF flows). Covering the issue of personal characteristics, it appears that being a woman decreases the chance of leaving unemployment for a job (coefficient of -0.190), but doesn't influence the probability of getting outside the labour force (coeff.: 0.124). Married individuals are more likely to re-enter to employment once unemployed, while the likelihood of becoming inactive is reduced.

Children affect differently transitions from unemployment of men and women. Women with a baby of two years or younger are less likely to get employed (coeff. -0.349) and face a higher risk to exit from the labour market (coeff. 0.447). Children, older than two, but younger than seven also reduce their employment probability (coefficient of -0.175), but have only a slight impact on getting them into inactivity, while those, older than six, lower the chance of exiting unemployment for OLF (coeff. -0.428).

The effect of having a child however is opposite for men - children of all age groups increase their fathers' employment probabilities, and those, older than two, lower the risk of getting outside the labour force. This difference is not surprising, since women are likely to drop temporarily from the labour market

because of childbearing reasons, while having a family to support may increase the motivation of men to get a job.

Concerning the age differences, I find the youngest individuals to be the most flexible, while the those over fifty - to be disadvantaged in the labour market. Compared to the middle-aged (30-49 age group) individuals, the youth are more likely to exit unemployment for both job and OLF (positive coefficients of 0.368 and 0.303 respectivelly). The elderly workers, however, have much lower chances to get employed (coeff. -0.657), and face comparatively high risk to get into inactivity (coeff. 0.448).

Another important characteristic is immigration status. The immigrants are found to be a group facing a higher risk to be trapped in this situation - on the one hand they experience a lower chance of leaving unemployment for a job (coeff. -0.584), but on the other hand - a lower risk of getting outside the labour force (coeff. -0.146).

The positive effect of education on employment and the negative effect on OLF suggests that the less educated persons tend to remain unemployed or to withdraw from the labour market compared to the more educated.

The unemployment insurance fund membership also plays an important role in explaining the transitions from unemployment. The members of all UI funds face a much lower risk of leaving unemployment for inactivity than the refference category - *SID+KAD* - which are the two main insurance funds for unskilled men and women. Being previously self-employed or in the trade sector reduces the re-employment probability.

Table 3: Transitions from Unemployment

Variables	To Employment		To OLF	
	Coeff.	Std. err.	Coeff.	Std. err.
Female worker	**-0,190**	**0,018**	0,024	0,029
Age (ref: 30-49)				
20-29 years	**0,368**	**0,019**	**0,303**	**0,030**
50-59 years	**-0,657**	**0,027**	**0,448**	**0,037**
Married	**0,065**	**0,017**	*-0,045*	*0,027*
Immigrant	**-0,584**	**0,036**	**-0,146**	**0,046**
Age of youngest child (for women)				
0-2 years	**-0,349**	**0,029**	**0,447**	**0,035**
3-6 years	**-0,175**	**0,035**	*0,086*	*0,050*
7-17 years	0,012	0,041	**-0,428**	**0,076**
Age of youngest child (for men)				
0-2 years	**0,150**	**0,029**	-0,092	0,067
3-6 years	**0,133**	**0,038**	**-0,363**	**0,099**
7-17 years	**0,146**	**0,041**	***-0,220***	***0,103***
Education (ref:<10 years)				
10-11 years	0,030	0,023	-0,019	0,035
12 years	**0,228**	**0,025**	**0,122**	**0,014**
13-14 years	**0,209**	**0,018**	**-0,048**	**0,009**
15-16 years	**0,321**	**0,029**	**-0,074**	**0,015**
17-18 years	**0,623**	**0,049**	**-0,145**	**0,031**
Experience	**0,011**	**0,001**	**-0,016**	**0,002**
Previous state - employment	**0,436**	**0,017**	**-0,265**	**0,024**
UI fund membership (ref: SID+KAD)				
Metal	0,034	0,033	**-0,705**	**0,074**
Manufact	0,021	0,021	**-0,740**	**0,037**
Construct	**0,381**	**0,031**	**-0,721**	**0,076**
Tech	**-0,300**	**0,038**	**-0,566**	**0,061**
Trade	**-0,410**	**0,027**	**-0,506**	**0,038**
Clerical	**0,093**	**0,029**	**-0,467**	**0,048**
Acad	**-0,186**	**0,042**	**-0,628**	**0,072**
Uiother	**-0,091**	**0,029**	**-0,525**	**0,047**
Selfs	**-0,510**	**0,051**	**-0,362**	**0,062**
Place of residence (ref: other)				
Copenhagen	**-0,225**	**0,019**	-0,003	0,028
Aarhus	**-0,155**	**0,031**	**0,161**	**0,045**
Odense	**-0,142**	**0,036**	-0,044	0,057
Aalborg	**-0,105**	**0,036**	0,012	0,059
Baseline hazard (ref: 1-3)				
4-6 months	**0,334**	**0,018**	**0,142**	**0,033**
7-9 months	**0,106**	**0,022**	***-0,088***	***0,040***
10-12 months	**-0,117**	**0,026**	**-0,118**	**0,045**
13-15 months	**-0,301**	**0,033**	*-0,091*	*0,050*
16-18 months	**-0,308**	**0,037**	0,063	0,053
19-21 months	**-0,536**	**0,046**	0,026	0,059
22-24 months	**-0,549**	**0,052**	**0,289**	**0,059**
25-36 months	**-0,653**	**0,039**	**0,460**	**0,041**
37-60 months	**-1,269**	**0,064**	**0,321**	**0,064**
61-84 months	**-1,101**	**0,079**	**1,745**	**0,169**
>84 months	**-2,458**	**0,166**	**1,485**	**0,135**
Constant	**-2,969**	**0,031**	**-3,314**	**0,046**
Mass points				
1 (Pr (1) = 0,34)	***0,676***	***0,174***	-0,032	0,115
2 (Pr (2) = 0,66)	**-0,348**	**0,086**	0,056	0,191

Bold: significant at 1% level; ***bold-italic:*** significant at 5% level; *italic:* significant at 10% level

Persons, employed in the previous spell, have a higher likelihood of re-entry to employment (coefficient of 0.436) and a lower risk of inactivity (coeff. -0.265).

The geographical characteristics of unemployed individuals also seem to have an impact on their future labour market prospect. The residents of the counties with the four biggest Danish cities are found to be disadvantaged, compared with the refference category (other place of residence). Living in Copenhagen prolongs persons' survival in unemployment (coefficient to exit for job: -0.225), while the inhabitants of Aarhus county face the highest risk to become inactive (coeff. to flow into OLF: 0.161).

Turning to the issue of duration depence, I find a negative duration dependence in the U-E flows and a positive duration dependence while moving from unemployment into inactivity - the long-term unemployment reduces persons' re-employment probability and increases the risk of getting outside the labour market.

And finaly, I cover the estimations of the individual unobserved heterogeneity. I account for unobserved heterogeneity by employing two mass points of support to improve the model. The presence of these points means that the persons can be divided into two heterogeneous groups. Table 3 indicates that the first group of individuals has an above average probability of exiting unemployment for a job (the coefficient is: 0.676). The probabilities for the mass points are: $Pr(\varepsilon 1) = 0.34$ and $Pr(\varepsilon 2) = 0.66$. This means that for some unobserved reasons 34% of unemployed persons are in a better situation to get back into employment.

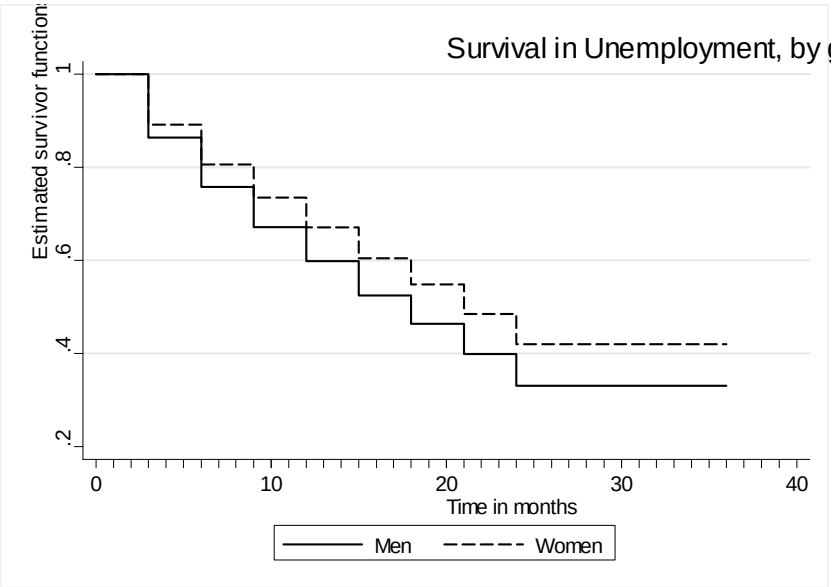
To summarise the previous results and to illustrate the duration dependence pattern, I have computed the survivor and hazard functions, based on the gender and the age of individuals. The functions have been calculated for the sub-groups of persons from the estimated coefficients, based on gender and age specific characteristics means. One hazard rate is found for each unobserved heterogeneity group, and the overall hazard rate is predicted as the sum of group-specific hazards, weighted by the probabilities of belonging to specific heterogeneity group.

The graphs show a steady decline over time in the survivor functions for both genders and all age groups. It turns out that women remain in unemployment longer than men. Differences in the survival among the age groups, however, are sharper. The elderly individuals experience higher survival rates while the youngest group have the best chances to leave unemployment (after two years of unemployment 23% of the youth, but 55% of the elderly ones remain in such situation).

Transitions to employment decline gradually (especially for men and for the youth), but remain rather stable after the first year of unemployment. The flows into OLF, contrary, firstly remain stable, but increase sharply after 21 months. Concerning the gender issue, I find women to experience lower transitions to a job (especially in the first year of unemployment) and higher flows to inactivity, while the age-based analysis discovers the youngest to have highest chances to move to a job, but also to OLF. The elderly persons are less likely to transit to a job, and the middle-aged ones have the lowest risk of becoming inactive.

Figure 1: Survival in Unemployment

1.A.:



1.B.:

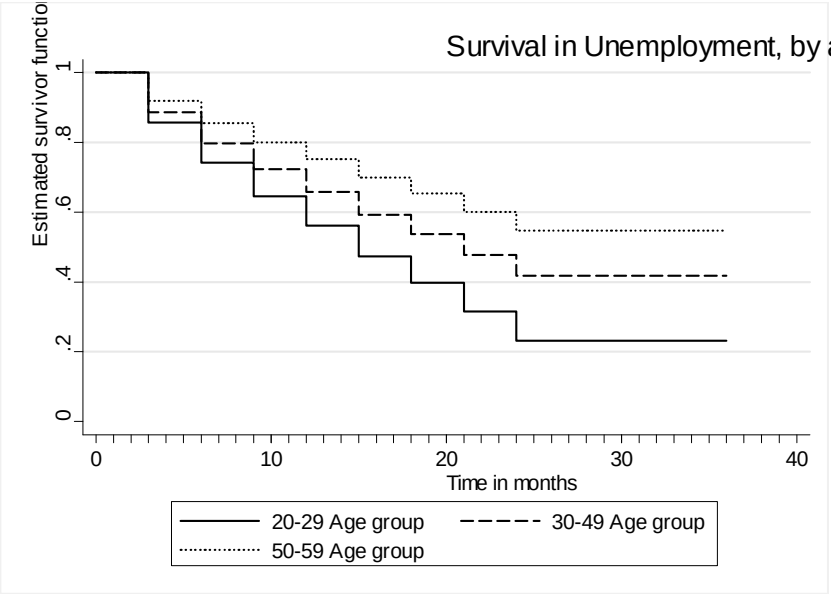
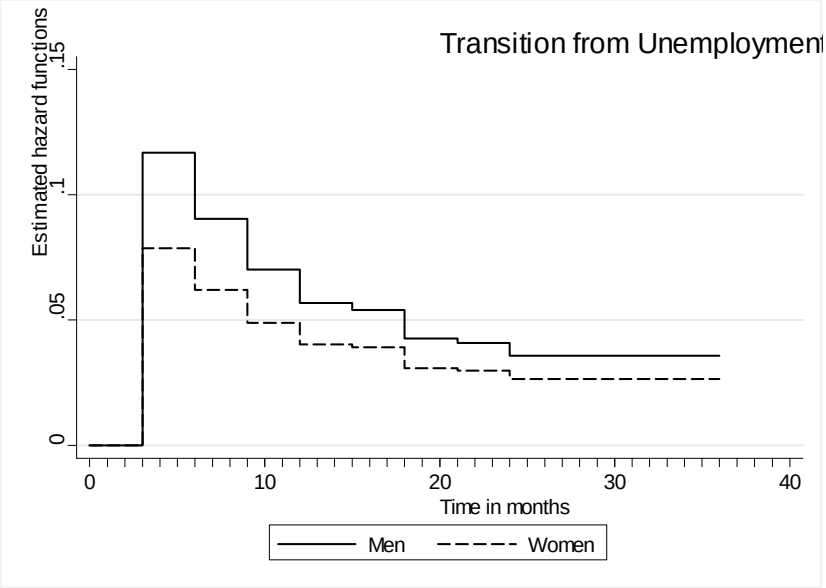


Figure 2: Transitions from Unemployment to Employment

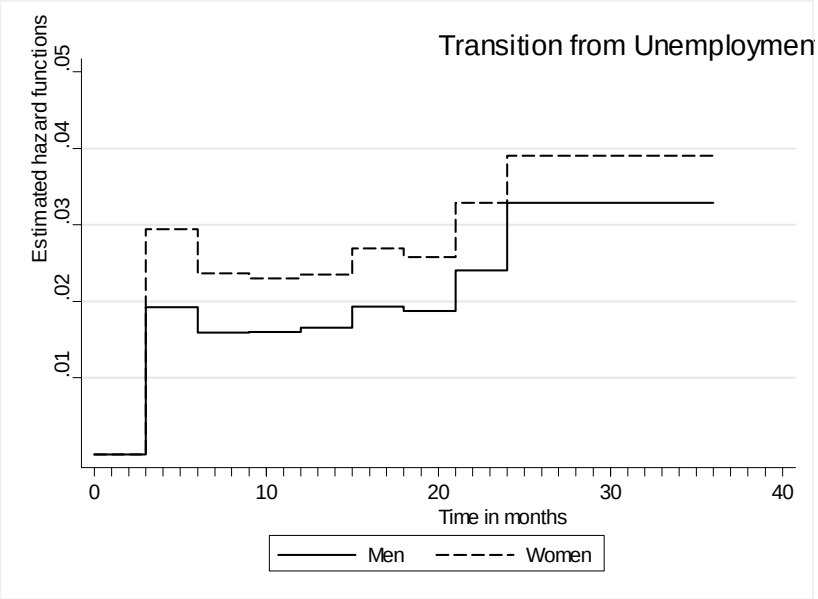
2.A.:



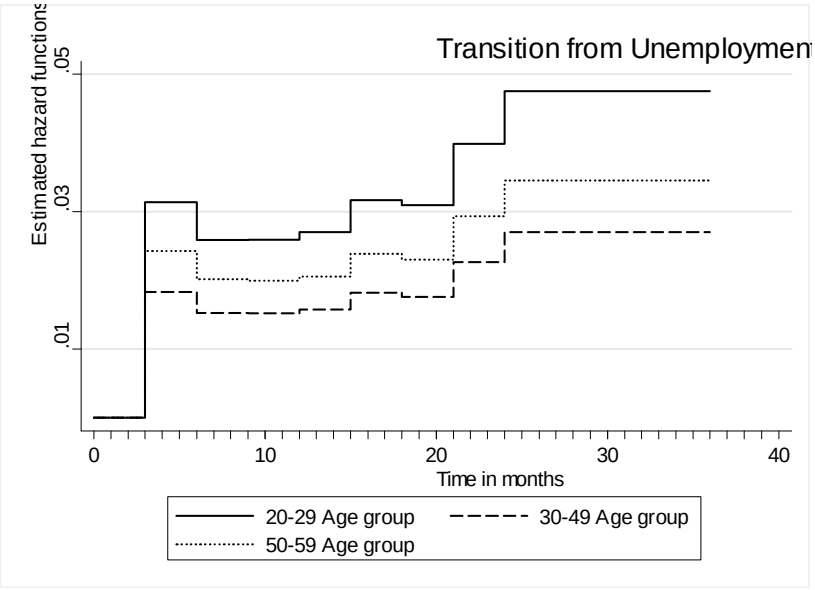
2.B.:

Figure 3: Transitions from Unemployment to OLF

3.A.:



3.B.:



5.3. Transitions from Employment

This sub-section tackles transitions from employment into unemployment and inactivity (the E-U and E-OLF flows). Concerning the effect of gender and personal characteristics, I discover that being a woman or an immigrant increases the risk of re-entry to unemployment (the coefficients are 0.107 and 0.163 respectivelly), but doesn't influence the flows into inactivity. Being married plays a positive role for the employment situation (the probabilities of getting unemployed or inactive are reduced), while children have different impact for men and women. The effect of having a child, younger than seven, is found not to be significant regarding exits from unemployment of women. Children of seven or older, however, make their mothers more attached to the labour market (the coeff. for exits from employment is: (-0.170) + (-0.283) = (-0.453)).

For men, differently, children older than six don't seem to be an important factor in their employment survival, but small children make them more likely to stay in job. And this could again be explained by the positive effect of having family to support to their motivation of remaining employed.

Concerning the age differences, both younger and older workers are found to remain in job shorter than the middle-aged individuals. Belonging to 20-29 age group reduces the risk of unemployment (coeff.: -0.293), but the probability of dropping outside the labour market increases. Thus, the overall risk of exiting employment is higher (the coeff. is: (-0.293) + 0.458 = 0.165). The elderly persons, however, face the highest risk of exiting job for both unemployment and inactivity (coeff.: 0.345 + 0.227 = 0.572).

Table 4: Transitions from Employment

Variables	To Unemployment		To OLF	
	Coeff.	Std. err.	Coeff.	Std. err.
Female worker	**0,107**	**0,029**	-0,004	0,031
Age (ref: 30-49)				
20-29 years	**-0,293**	**0,030**	**0,458**	**0,066**
50-59 years	**0,345**	**0,040**	**0,227**	**0,041**
Married	**-0,113**	**0,028**	**-0,160**	**0,044**
Immigrant	**0,163**	**0,053**	0,076	0,068
Age of youngest child (for women)				
0-2 years	0,012	0,052	0,001	0,065
3-6 years	0,052	0,053	-0,075	0,074
7-17 years	**-0,170**	**0,069**	**-0,283**	**0,103**
Age of youngest child (for men)				
0-2 years	-0,010	0,049	**-0,288**	**0,086**
3-6 years	**-0,165**	**0,066**	**-0,318**	**0,128**
7-17 years	0,146	0,041	-0,146	0,151
Education (ref:<10 years)				
10-11 years	*-0,068*	*0,036*	**-0,209**	**0,049**
12 years	**-0,545**	**0,040**	**0,240**	**0,041**
13-14 years	**-0,248**	**0,029**	**-0,281**	**0,044**
15-16 years	**-0,460**	**0,052**	**-0,245**	**0,047**
17-18 years	**-0,719**	**0,089**	**-0,417**	**0,107**
Experience	**-0,025**	**0,002**	**-0,035**	**0,003**
UI fund membership (ref: SID+KAD)				
Metal	**0,604**	**0,057**	**-1,299**	**0,112**
Manufact	**0,796**	**0,034**	**-1,221**	**0,060**
Construct	**0,814**	**0,051**	**-1,298**	**0,113**
Tech	**0,328**	**0,062**	**-1,094**	**0,101**
Trade	**0,364**	**0,044**	**-1,269**	**0,072**
Clerical	**0,184**	**0,051**	**-1,133**	**0,073**
Acad	**0,333**	**0,076**	**-1,060**	**0,095**
Uiother	**0,586**	**0,045**	**-0,911**	**0,074**
Selfs	**-0,294**	**0,092**	**-1,044**	**0,124**
Place of residence (ref: other)				
Copenhagen	**-0,179**	**0,030**	**0,212**	**0,032**
Aarhus	**-0,157**	**0,050**	**0,466**	**0,045**
Odense	*0,094*	*0,054*	*0,114*	*0,062*
Aalborg	**0,244**	**0,055**	**0,234**	**0,068**
Baseline hazard (ref: 1-3)				
4-6 months	**-0,300**	**0,028**	-0,036	0,035
7-9 months	**-0,593**	**0,036**	**-0,427**	**0,046**
10-12 months	**-1,170**	**0,051**	**-0,878**	**0,061**
13-15 months	**-2,016**	**0,081**	**-1,566**	**0,089**
16-18 months	**-2,017**	**0,084**	**-1,623**	**0,096**
19-21 months	**-2,063**	**0,090**	**-1,782**	**0,108**
22-24 months	**-2,150**	**0,097**	**-1,259**	**0,088**
25-36 months	**-2,441**	**0,063**	**-1,863**	**0,069**
37-60 months	**-3,087**	**0,072**	**-2,146**	**0,069**
61-84 months	**-3,521**	**0,104**	**-2,341**	**0,091**
>84 months	**-3,539**	**0,111**	**-2,197**	**0,092**
Constant	**-2,387**	**0,045**	**-2,703**	**0,056**
Mass points				
1 (Pr (1) = 0,21)	*-0,439*	*0,262*	-0,327	0,243
2 (Pr (2) = 0,79)	***0,114***	***0,043***	***0,087***	***0,026***

Bold: significant at 1% level; ***bold-italic:*** significant at 5% level; *italic:* significant at 10% level

The education level is an important factor, helping to remain in a job once employed. Individuals in all educational groups are found to be in a favourable employment situation, compared to the reference group (those with nine or less years of education), and the most educated persons face the lowest risk of leaving unemployment (the coefficients for the hazards to unemployment and OLF for the group with 17-18 years of education are -0.719 and -0.417 respectively).

The effect of previous employment experience on the transitions from employment is found not to be strong, thought significant.

Unemployment insurance fund membership has a complementary role in explaining the flows from employment. The self-employed individuals are most likely to remain employed and face the lowest transitions into both unemployment and OLF (the coefficients: -0.294 and -1.044). It is surprising, that members of all other UI funds experience higher risk of re-entry to unemployment than the refference category - members of SID+KAD funds. But on the other hand, they also experience a much lower risk of moving outside the labour market, and thus are in a better employment situation than the unskilled workers.

Looking to the place of residence factor, I find the residents of Copenhagen, Aarhus, Odense and Aalborg to be more likely to exit employment than the refference category - residents of other places. Living in Odense or Aalborg increases the flows from employment to unemployment and OLF. The inhabitants of Copenhagen and Aarhus experience lower transitions to unemployment, but are at a higher risk of moving into inactivity. Thus, the effect of place of residence to the exit from employment is slightly positive (coeff.: (-0.179) + 0.212

= 0.033) for Copenhagen and positive (coeff.: (-0.157) + 0.466 = 0.309) for Aarhus.

There is a negative duration dependence in both E-U and E-OLF flows. The probability of exiting a job declines with the time spent employed, and there is a sharp decline in the baseline hazards after the first year of employment.

And lastly, concerning the unobserved heterogeneity issue, I find that for some unobserved reasons 21% of individuals face better chances to remain in a job once employed (coeff. for E-U flow is -0.439).

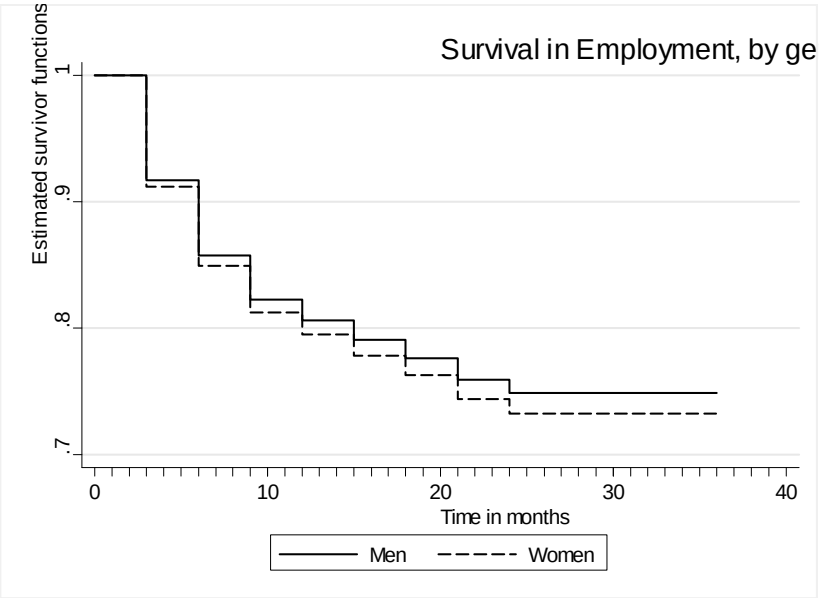
The age and gender specific survivor and hazard functions illustrate the findings above. It turns out that men stay employed longer than women, but the gender specific survival differences are slight. However, looking to the E-U and E-OLF flows (especially during the first year of employment), there is an evidence that men are more likely to leave a job for unemployment, while women tend to move into inactivity.

There is a minor difference in job survival of the youth and the elderly individuals, and both age groups survive employed shorter than their middle-aged counterparts. But here, again, there is a difference in the transitions - the youngest persons are much more likely to drop out of the labour market, while those older than 50 face the risk of re-entry to unemployment.

Another interesting and important finding is a sharp decline in the transition rates into unemployment and inactivity after the first year of employment: the individuals, who survived employed one year, tend to remain in that state.

Figure 4: Survival in Employment

4.A.:



4.B.:

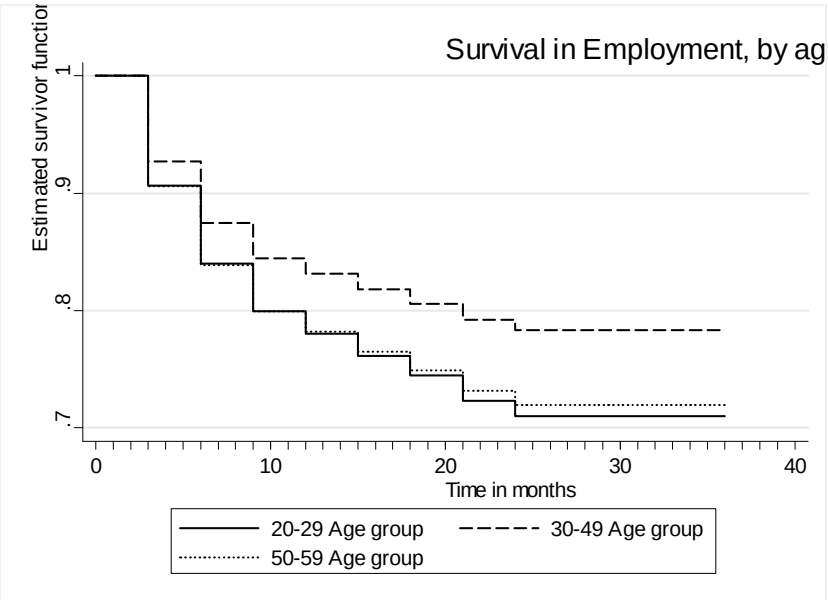
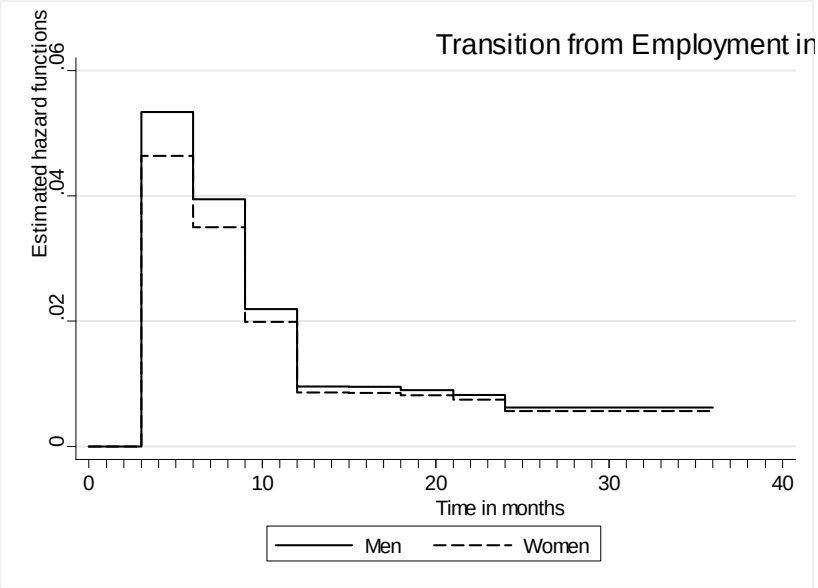


Figure 5: Transitions from Employment to Unemployment

5.A.:



5.B.:

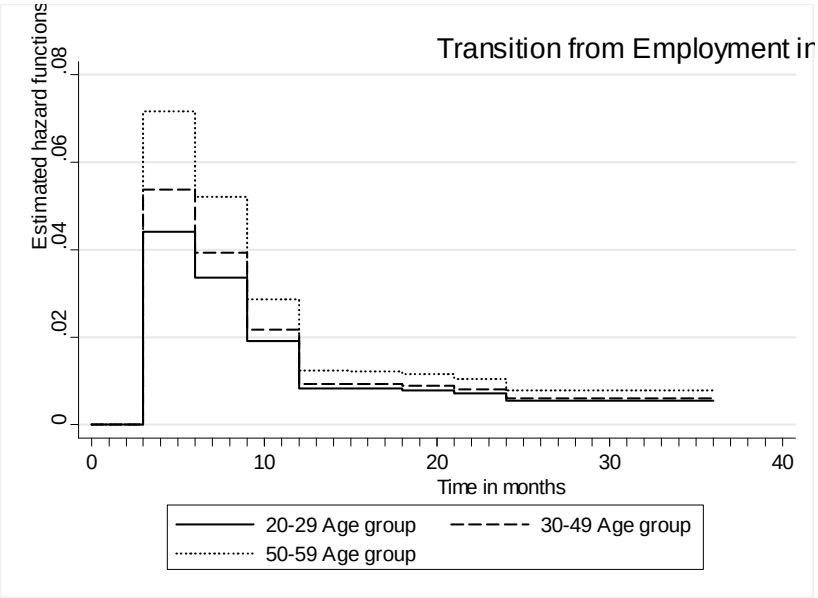
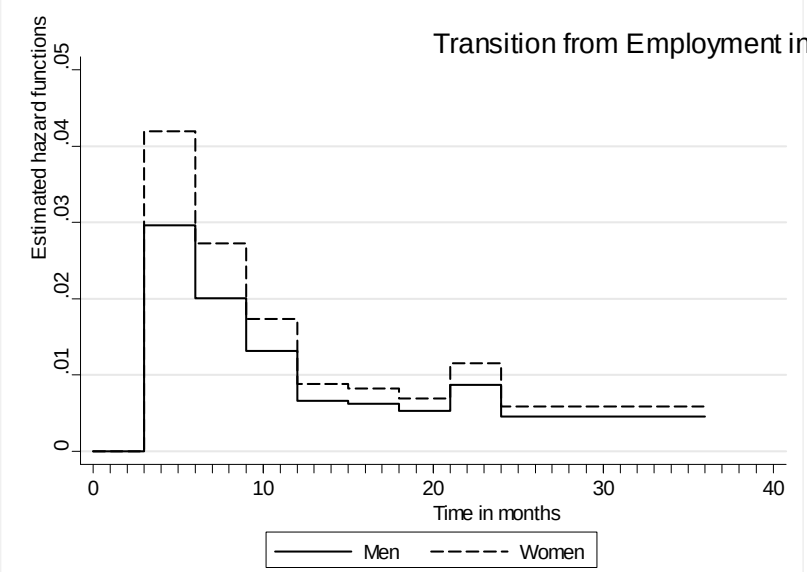
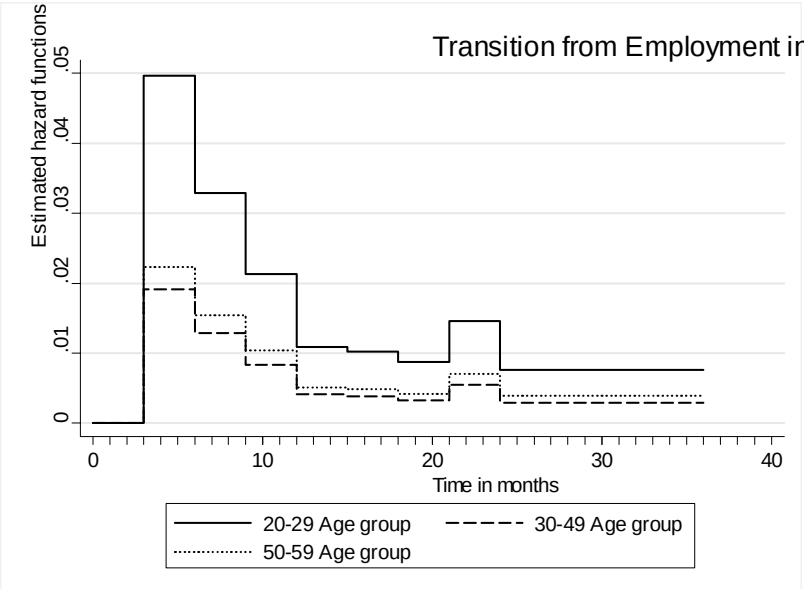


Figure 6: Transitions from Employment to OLF

6.A.:



6.B.:



5.4. Transitions from OLF

The analysis of the transitions from OLF (the OLF-E and OLF-U flows) leads to the result that being a woman reduces the chance of exiting OLF for employment (coefficient of -0.130). Being married has negative impact on the flows from inactivity as well, but the influence of mariage to the exit for employment is slight (coeff.: -0.055). Having a small child makes women less likely to leave OLF, but increases the probability of getting employed for men. And this could also be explained by the reasons mentioned in the sub-sections above.

Immigrants face a higher overall probability of leaving OLF. But this increase is due to the exit from OLF to unemployment (the coefficient for the OLF-E flow is -0.117), thus they are at the risk of being trapped in a long-term unemployment.

The age factor tend to play an extremely important role in explaining the transitions from inactivity. The youngest are found to be in the most favourable situation (coefficient for the OLF-E flow is 0.389), but here I want to pay attention to the elderly workers, who are found to be strongly disadvantaged in the labour market, compared to their younger counterparts. Being older than 50 sharply lowers the chances of exiting for both employment and unemployment, and the coefficient for overall OLF exit probability is (- 2.235).

The members of all UI funds survive shorter in inactivity than the reference category. Thus, the unskilled workers are found to be another problematic group, facing the risk of marginalisation from the labour market.

Table 5: Transitions from OLF

Variables	To Employment		To Unemployment	
	Coeff.	Std. err.	Coeff.	Std. err.
Female worker	**-0,130**	**0,022**	-0,009	0,030
Age (ref: 30-49)				
20-29 years	**0,389**	**0,030**	0,030	0,030
50-59 years	**-1,252**	**0,048**	**-0,983**	**0,046**
Married	***-0,055***	***0,029***	**-0,128**	**0,029**
Immigrant	***-0,117***	***0,050***	**0,288**	**0,045**
Age of youngest child (for women)				
0-2 years	**-0,507**	**0,039**	**-0,129**	**0,035**
3-6 years	-0,037	0,048	0,001	0,049
7-17 years	*0,108*	*0,065*	0,040	0,073
Age of youngest child (for men)				
0-2 years	**0,151**	**0,051**	*-0,096*	*0,065*
3-6 years	0,054	0,072	-0,067	0,087
7-17 years	0,053	0,083	*-0,183*	*0,111*
Education (ref:<10 years)				
10-11 years	**0,119**	**0,033**	-0,003	0,035
12 years	**0,122**	**0,030**	**-0,379**	**0,038**
13-14 years	**0,139**	**0,012**	**-0,093**	**0,032**
15-16 years	**0,125**	**0,039**	**-0,320**	**0,052**
17-18 years	**0,386**	**0,070**	**-0,417**	**0,092**
Experience	**0,006**	**0,002**	-0,001	0,003
Previous state - employment	**0,782**	**0,024**	**-0,853**	**0,026**
UI fund membership (ref: SID+KAD)				
Metal	**0,500**	**0,065**	**0,864**	**0,072**
Manufact	**0,414**	**0,039**	**0,828**	**0,036**
Construct	**0,543**	**0,068**	**0,562**	**0,080**
Tech	**0,268**	**0,064**	**0,881**	**0,059**
Trade	**0,159**	**0,044**	**0,701**	**0,040**
Clerical	**0,567**	**0,043**	**0,679**	**0,051**
Acad	**0,243**	**0,066**	**1,189**	**0,070**
Uiother	**0,333**	**0,050**	**0,744**	**0,049**
Selfs	**0,205**	**0,074**	*0,157*	*0,090*
Place of residence (ref: other)				
Copenhagen	*0,033*	*0,022*	***-0,061***	***0,029***
Aarhus	***-0,072***	***0,033***	**-0,156**	**0,046**
Odense	-0,040	0,044	*-0,108*	*0,057*
Aalborg	***-0,119***	***0,048***	0,029	0,055
Baseline hazard (ref: 1-3)				
4-6 months	**0,410**	**0,024**	**0,071**	**0,027**
7-9 months	**0,125**	**0,030**	**-0,385**	**0,038**
10-12 months	**0,520**	**0,031**	**-0,158**	**0,043**
13-15 months	**-0,694**	**0,058**	**-1,281**	**0,082**
16-18 months	**-0,520**	**0,059**	**-1,015**	**0,081**
19-21 months	**-0,766**	**0,073**	**-1,273**	**0,101**
22-24 months	**-0,470**	**0,070**	**-1,036**	**0,102**
25-36 months	**-0,986**	**0,055**	**-1,529**	**0,079**
37-60 months	**-1,765**	**0,075**	**-2,165**	**0,098**
61-84 months	**-2,455**	**0,123**	**-3,467**	**0,220**
>84 months	**-3,510**	**0,206**	**-6,452**	**1,000**
Constant	**-3,649**	**0,044**	**-2,618**	**0,045**
Mass points				
1 (Pr (1) = 0,84)	0,142	0,114	-0,098	0,309
2 (Pr (2) = 0,16)	***-0,746***	***0,175***	0,515	0,068

Bold: significant at 1% level; ***bold-italic:*** significant at 5% level; *italic:* significant at 10% level

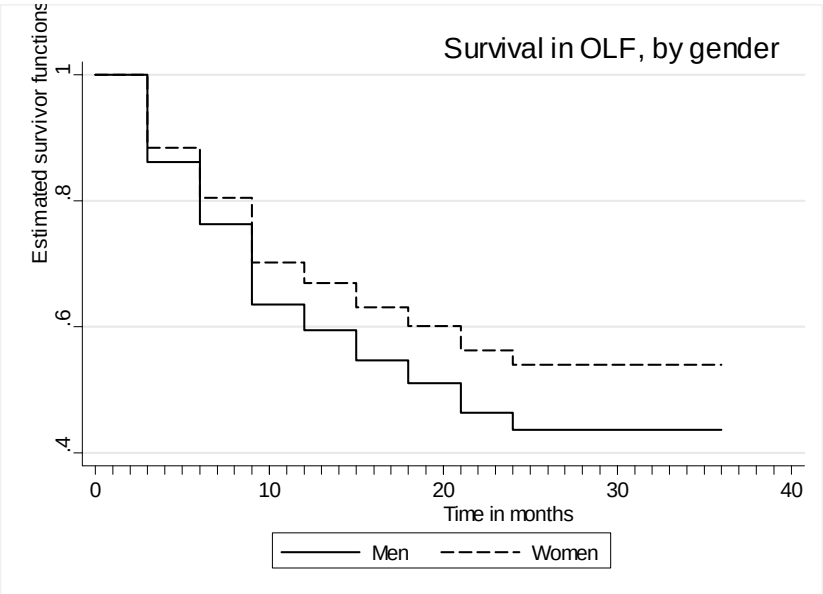
The number of years of education and being previously employed have a positive influence on the exit from OLF for employment. Representatives of the group with 17-18 years of education face the most favourable re-employment prospectives (coeff. 0.386). Those, who were previously employed, experience higher transitions to re-employment (coefficient of 0.782) and have lower chance to leave inactivity for unemployment (coeff. -0.853). This is in line with previous findings that inactive persons, who previously were employed, tend to return back into employment, while those previously unemployed face a risk of re-entry to unemployment (see Appendix table A.1.3.)

Concerning the geographical pattern, again I find the residents of counties with the four biggest Danish cities to be disadvantaget in the labour market. Living in Copenhagen, however, increases slighly the chance of getting back into employment (coeff.: 0.033), but on the other hand slightly decreases the transitions into unemployment (coeff.: -0.061). The negative effect of residing in Aarhus is not very strong as well (coeff.: -0.072), but here I want to mention that the inhabitants of Aarhus and Odense are less likely to leave OLF for unemployment, that is there is a danger for these individuals to be discouraged to search for a job and thus, to be marginalised out of the labour market. The residents of Aalborg face the lowest transitions from OLF to employment.

Like in the case of the U-E flow, here I discover the presence of negative duration dependence. In the transitions from OLF into employment, however I find individuals more likely to move for a job during the first year (especially in 10-12 months) in OLF.

Figure 7: Survival in OLF

7.A.:



7.B.:

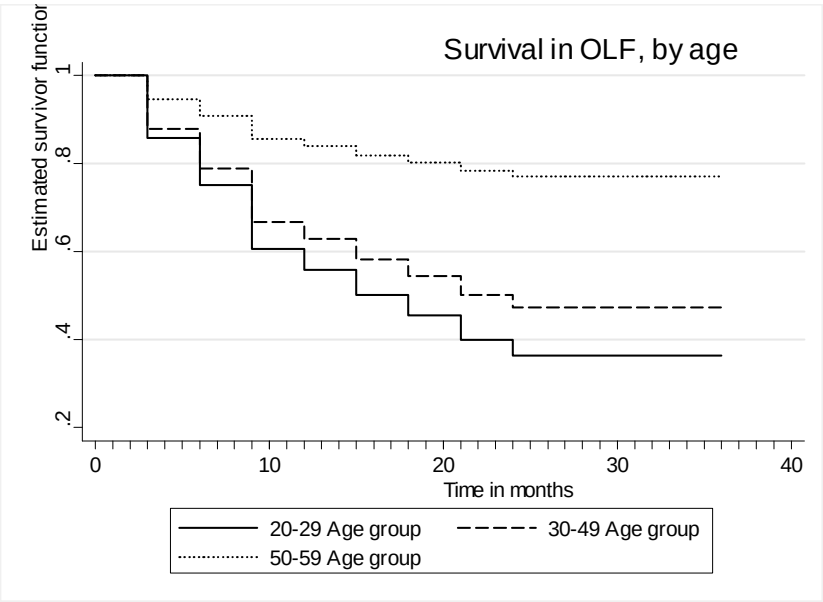
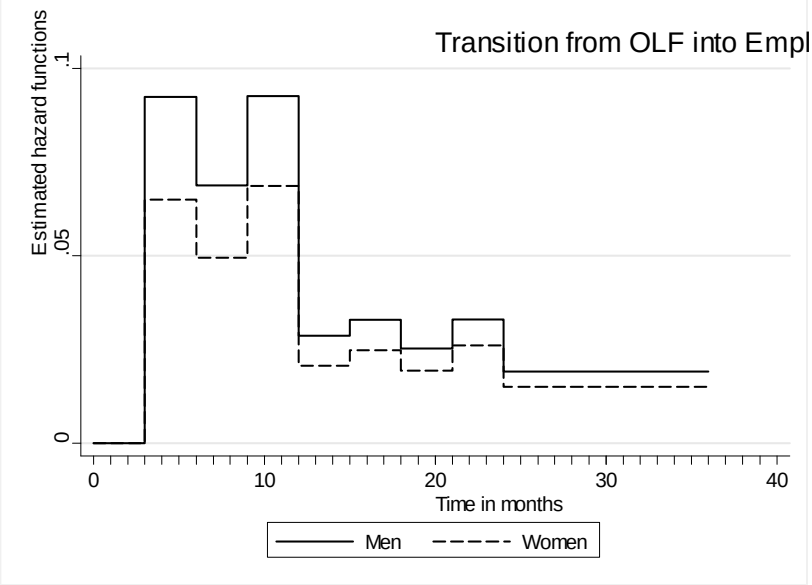


Figure 8: Transitions from OLF to Employment

8.A.:



8.B.:

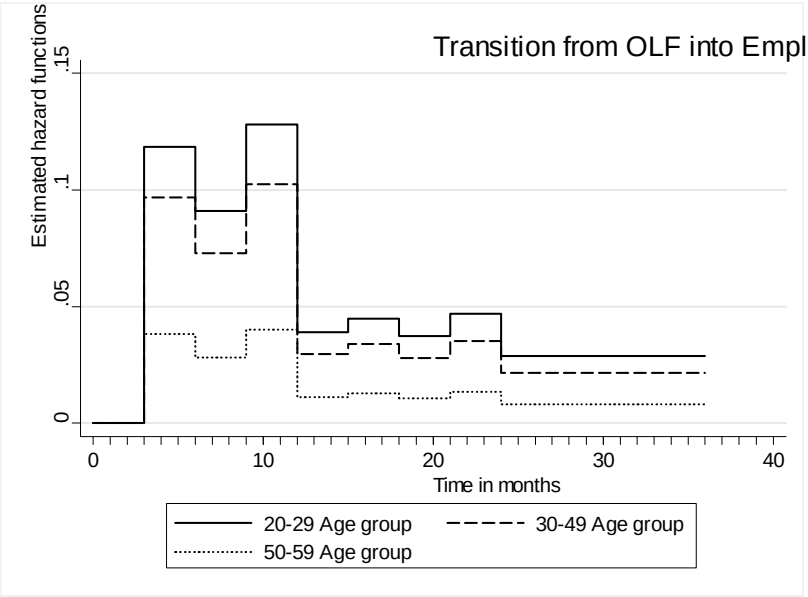
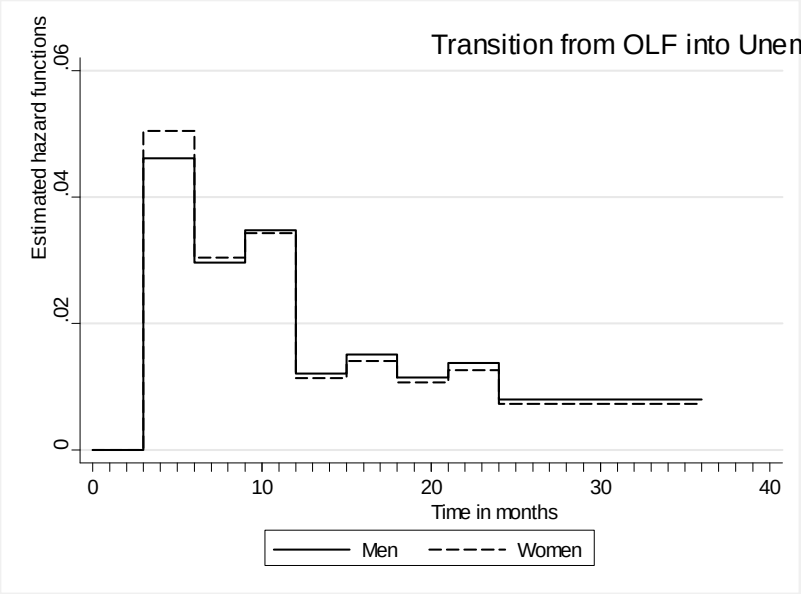
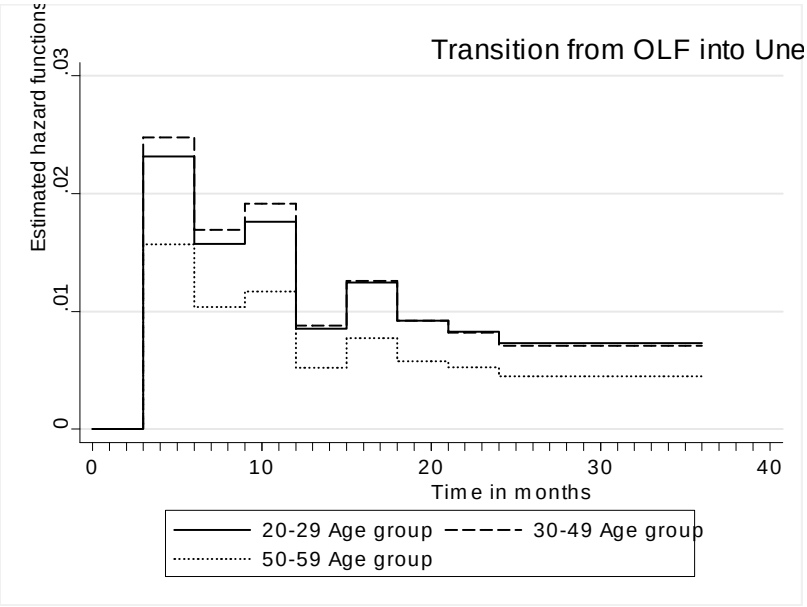


Figure 9: Transitions from OLF to Unemployment

9.A.:



9.B.:



But the situation changes drastically after the first year of inactivity. For the OLF-U transitions, I observe a negative duration dependence during the whole period of inactivity, that is the time, spent outside the labour market, discourage people to search for a job.

And finally, concerning the individual unobserved heterogeneity, I discover 16% of inactive persons to have a lower chance of leaving OLF for a job.

Now, again, I illustrate the findings above by graphing gender and age based survivors and hazards. I observe women to survive in OLF longer than men. Concerning the age of the persons, the youngest are least likely to remain inactive, while the elderly are found to be the risk group. After two years in OLF 36% of 20-29 old individuals, but 77% of those, older than 50, remain in this state.

There are no gender differences in the transitions from OLF into unemployment, but women experience lower chances of leaving inactivity for a job, especially during the first year outside the labour market.

The youth are more likely to move for employment than their older counterparts, while looking to the OLF-UI flow, I find the middle-aged to be in the best situation. And in both transitions I find again the age based differences to be mostly expressed in the first year of inactivity.

And the last and very important finding is a sharp decline in both transitions after the first year in OLF. In the previous chapter I mentioned such break to be existent in the case of employment, however here it is even more expressed. For example, during the 10-12 months of inactivity the hazards for the 20-29,

30-49 and 50-59 age groups are 13%, 10% and 4%, but after one year, spent in OLF, they drop to 4%, 3% and 1% respectivelly. Similar behaviour is observed in gender based hazard rates, and in the hazards from OLF into unemployment.

6. Conclusions

In this paper I used the longitudinal register-based data and estimated a discrete time hazard model for the exits from the different labour market states - unemployment, employment and inactivity - in the Danish labour market. I distinguished between the different possible destination states, adopted a competing risks formulation and ran a multinomial logit estimation.

The estimations results find women to face a higher risk of getting outside the labour market and to experience higher survivals in both unemployment and inactivity.

The youth is found to be the most flexible age group, most likely to leave employment and unemployment for OLF, but also having the highest transitions back into employment, while those over fifty are found to face the highest risk of long-term unemployment and marginalisation from the labour market.

Years of education make persons less likely to exit for unemployment or inactivity, and help them to find a job once unemployed or outside the labour force, while the unskilled workers found to be a highest risk group to drop out of the labour force, and to remain in that state once inactive.

Being previously employed reduces the risk of OLF, and increases the re-entry to employment probability, while living in the biggest Danish cities, where

job competition is high, makes individuals disadvantaged. These findings give evidence that the 'Flexicurity' model makes the weakest individuals disadvantaged in the Danish labour market.

And finally, I find a break in the transition rates from employment and inactivity after 12 months spent there: those, who survived in a job one year, tend to remain employed, while persons, longer than one year inactive, face much higher risk of marginalisation from the labour market.

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APPENDIX

Table A.1.1.: Employment spells in 1% representative sample (1994-2003)*

	If previous spell - unemployment	**If previous spell - OLF**
Spells ending in unemployment, %	42,3	14,2
Spells ending in OLF, %	9,2	47,3
Right-censored spells, %	48,5	38,5
Non right-censored spells ending in:		
Unemployment, %	82,2	23,1
OLF, %	17,8	76,9
Lenght of non-censored spell (in months)	7,8	9,3

* I use the longitudinal register-based data set of event histories for persons belonging to a representative 1% sample of the 16-70 year aged Danish population. Persons younger than 20 and older than 59 have been excluded.

Table A.1.2.: Unemployment spells in 1% representative sample (1993-2004)*

	If previous spell - employment	**If previous spell - OLF**
Spells ending in employment, %	66,4	45,3
Spells ending in OLF, %	12,4	26,1
Right-censored spells, %	21,2	28,6
Non right-censored spells ending in:		
Employment, %	84,3	63,4
OLF, %	15,7	36,6
Lenght of non-censored spell (in months)	6,3	7,0

* I use the longitudinal register-based data set of event histories for persons belonging to a representative 1% sample of the 16-70 year aged Danish population. Persons younger than 20 and older than 59 have been excluded.

Table A.1.3.: OLF spells in 1% representative sample (1994-2003)*

	If previous spell - employment	**If previous spell - unemployment**
Spells ending in employment, %	58,0	23,0
Spells ending in unemployment, %	13,8	44,1
Right-censored spells, %	28,2	32,9
Non right-censored spells ending in:		
Employment, %	80,7	34,2
Unemployment, %	19,3	65,8
Lenght of non-censored spell (in months)	7,4	6,2

* I use the longitudinal register-based data set of event histories for persons belonging to a representative 1% sample of the 16-70 year aged Danish population. Persons younger than 20 and older than 59 have been excluded.

Table A.2.: Sample composition (gender based)*

	Unemployment	Employment	OLF
Men			
Number of observations	**106749**	**331236**	**104834**
Number of individuals**	**2517**	**3789**	**2155**
Number of spells	**16510**	**22214**	**11321**
Non right-censored spell ending in			
Unemployment, %	-	60,3	29,9
Employment, %	84,9	-	70,1
OLF, %	15,1	39,7	-
Lenght of non-censored spell (in months)	**5,9**	**8,6**	**6,6**
Women			
Number of observations	**134236**	**304897**	**144338**
Number of individuals**	**2823**	**3792**	**2799**
Number of spells	**17432**	**22104**	**14950**
Right-censored spells, %	27,2	44,8	31,1
Non right-censored spell ending in			
Unemployment, %	-	52,2	36,8
Employment, %	74,7	-	63,2
OLF, %	25,3	47,8	-
Lenght of non-censored spell (in months)	**7,2**	**8,3**	**7,3**

* I use the longitudinal register-based data set of event histories for persons belonging to a representative 1% sample of the 16-70 year aged Danish population. Persons younger than 20 and older than 59 have been excluded.

** Number of people having unemployment, employment or OLF as their first spell

Table A.3.: Sample composition (age groups)*

	Unemployment	Employment	OLF
20-29 group			
Number of observations	**70486**	**257835**	**100399**
Number of spells	**12072**	**19341**	**12637**
Right-censored spells, %	15,9	38,0	22,5
Non right-censored spell ending in			
Unemployment, %	-	41,8	26,9
Employment, %	77,7	-	73,1
OLF, %	22,3	58,2	-
Lenght of non-censored spell (in months)	**5,5**	**8,2**	**7,7**
30-49 group			
Number of observations	**120201**	**306605**	**94326**
Number of spells	**16914**	**20230**	**10510**
Right-censored spells, %	27,0	50,5	31,9
Non right-censored spell ending in			
Unemployment, %	-	68,6	40,4
Employment, %	83,4	-	59,6
OLF, %	16,6	31,4	-
Lenght of non-censored spell (in months)	**6,5**	**8,2**	**6,3**
50-59 group			
Number of observations	**50298**	**71693**	**54447**
Number of spells	**4956**	**4747**	**3124**
Right-censored spells, %	31,3	46,1	51,6
Non right-censored spell ending in			
Unemployment, %	-	75,7	46,8
Employment, %	74,0	-	53,2
OLF, %	26,0	24,3	-
Lenght of non-censored spell (in months)	**9,6**	**10,2**	**5,5**

* I use the longitudinal register-based data set of event histories for persons belonging to a representative 1% sample of the 16-70 year aged Danish population. Persons younger than 20 and older than 59 have been excluded.