ARE WOMEN AND MEN EQUAL IN THE EFFECT OF UNEMPLOYMENT ON FUTURE WAGES ? AN ANALYSIS FOR EMPLOYEES BASED ON THE ECHP

Olivia EKERT-JAFFÉ[*] *Isabelle TERRAZ*[**]

Abstract:

This paper investigates the effect of unemployment on men and women's monthly wages for eight European countries. Using a harmonised database (ECHP), we estimate the impact of declared unemployment on employees while taking account of attrition and unobserved individual heterogeneity. We find sizable unemployment effects. In most of the countries, the wage penalty represents from 4% to 9%, and appears to be even higher in the more flexible economies. In certain countries we do not find any gender differences. This is not the case for Belgium, where the scarring effect is particularly strong for women, and France and Italy, where it is particularly weak. Nevertheless, focusing on women who work full time, there is no gender difference in France. To explain the discrepancies between countries, we suggest that labour market institutions such as unemployment benefits and wage-setting institutions may be avenues of investigation.

Keywords : Unemployment, Unobserved heterogeneity, post unemployment earnings

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[*]Olivia EKERT-JAFFE
INED
133 Boulevard Davout
75020 PARIS
Tél : +33 1 56 06 21 27
Fax : +33 1 56 06 21 99
ekert@ined.fr

[**]Isabelle TERRAZ
Université de Strasbourg
BETA
61 Avenue de la Forêt Noire
67085 Strasbourg Cedex
Tél : +33 3 68 85 20 83
Fax: +33 3 68 85 20 70
terraz@unistra.fr

Unemployment leaves its mark on people. It can affect both the well-being and the health of those who are affected (Clark, 2008; Bell and Blanchflower, 2011; Mesrine 2000). In addition to, or associated with, these psychological and social effects, it appears that a period of unemployment also affects individuals' economic potential. It leads to a loss of income at the time and increases the likelihood of experiencing a further period of unemployment or lower wages. When a previously jobless person returns to work, they may have a lower income than someone whose career has not been interrupted.

Economic theory offers a number of ways of explaining the wage penalty due to unemployment. In terms of human capital theory (Becker, 1962 and 1975), unemployment may be seen as the breakdown of an employment relationship for which the worker had developed skills and specific human capital. In this case, on taking another job, they will no longer be able to return to their earlier productivity and their earnings may be reduced. According to Spence (1973), the employer, with imperfect information, attempts to infer a person's productivity from information such as their educational qualifications. Extending this analysis, one may suppose that a period of unemployment may also be perceived as a negative signal of the unemployed person's abilities, thereby encouraging the employer to reduce the wages offered. There is an apparent stigma related to unemployment. The search and matching theory (Mortensen, 1986) provides more nuanced conclusions whereby the impact of unemployment depends on the quality of the previous job match. A period of unemployment that destroys a "successful" match may lower the future earnings of the unemployed person if they find a job in which they are less efficient. Conversely, the break may be beneficial if it enables them to find a better match and therefore be more productive. In particular, voluntary mobility may lead to better earnings. The impact of unemployment on wages mays then be positive or negative, and is thus an empirical question. Furthermore, it is likely to vary from one country to another as a function of the labour market institutions.

Researchers in the United States were among the first to examine the consequences of involuntary unemployment on individuals. During the industrial restructuring of the 1980s, they focused on "displaced workers[1]" with some years of seniority that lost their jobs as a

[1] The definition of the US Bureau of Labor Statistics is as follows: "persons 20 years of age and older who lost or left jobs because their plant or company closed or moved, there was insufficient work for them to do, or their position or shift was abolished." Jacobson, Lallonde and Sullivan (1993) examined workers who had worked for at least six years with the same company before losing their jobs.

result of factory closure or downsizing. Studies based on a survey[2] monitoring these workers (Topel, 1990; Farber, 1993 and 1997; Neal, 1995) found a negative effect of unemployment on new hire wages by comparing wages before and after the period of unemployment. However, the extent of wage loss may be underestimated, since the wages of continuously employed workers increased during that period. Moreover, the wages of people who were later laid off were already lower than those of people whose employment was not interrupted (Jacobson *et al.*, 1993). For these various reasons, and to compare these workers with those continuously employed, studies using longitudinal databases (Ruhm, 1991; Stevens, 1997) and administrative data (Jacobson *et al.*, 1993 and 2005) added greater detail to the analysis. They note persistent negative effects of unemployment on re-hire wages. Six years after the job loss, Jacobson *et al.* (1993) find a wage penalty of 25% for unemployed workers in Pennsylvania. This loss, much higher than that found in other articles (roughly 10%-15%), may be due to the poor state of the economy at that time (Couch and Placzek, 2010). The negative effect of unemployment would thus be explained by a loss of human capital, particularly firm-specific human capital, because these studies focus on workers with some job seniority who are made redundant. In support of this thesis, Carrington (1993) notes that the penalty is higher when workers change industry.

The literature on displacement in Europe is much less extensive. Full-time male workers in Germany (Burda and Mertens, 2001) experience a low unemployment wage penalty on re-hire (3.6%). Indeed the effect is a positive one for bottom quartile workers, those most likely to be affected by job losses due to industrial restructuring. This finding confirms those of earlier studies showing a small effect of unemployment on displaced workers in continental European countries (Kuhn, 2002; Leonard and Van Audenrode, 1995; Ackum, 1991). Kuhn (2002) attributed this to income support for the unemployed and wage-setting institutions in these countries.

Allowing for unobserved heterogeneity and selection bias, two articles on British male workers (Arulampalam, 2001; Gregory and Jukes, 2001) calculate an unemployment-related penalty of 6% and 10% respectively. Arulampalam adds that inactivity lowers expected wages even more. The existence of a wage penalty is confirmed for the UK economy, taking into account all unemployment periods and not simply those of workers made redundant. This high penalty is not reported by Arranz et alii (2010) but they find a depressing effect of

[2] The Displaced Worker Supplement" (DWS), an additional part of the Current Population Survey (CPS), was carried out for the first time in 1984. It covered workers with some seniority who had lost their jobs because of restructuring. The survey was then repeated every four years.

unemployment on male wages in France, Germany, Portugal and Spain. Their results are based on constructed gross hourly wages from the European Household Panel. Since the European literature is less extensive and uses more diverse methods and databases, the question of an unemployment-related wage penalty is worth pursuing.

This article[3] uses the European Community Household Panel to examine whether there is an unemployment-related wage penalty in Europe and whether the effect of this penalty on the wage prospects of individuals varies from one legislative and institutional environment to another. Nevertheless, the article differs from the existing literature on a number of points. It examines the impact of unemployment reported by employees, whatever the cause of their job loss. Of course, we include here people who willingly leave their last position so as to find a better match. Also, taking account of "declared unemployment" may be justified since the borderline between economic inactivity and unemployment under the ILO definition may be blurred. It also allows us to construct real duration of unemployment as we observe the situation of individuals month by month. We carefully detail the source of the unemployment penalty, by distinguishing unemployment duration and loss of experience for instance. Like other articles, this one allows for unobserved heterogeneity and selection bias in its estimates. However, the Wooldridge method is used to correct for panel attrition and selection by introducing a selection equation each year. Finally, our analysis specifically introduces a gender dimension by estimating separate equations for men and women to see if the wage penalty of unemployment operates differently by gender in Europe. Our approach is thus broader than the usual ones. We finally check our results for robustness using different subsamples.

The paper is organised as follows. Section 1 describes the data set and Section 2 explains the methodology. Results are discussed in Section 3 and analysed with respect to the labour market framework of each country.

I. Description of database

Data and sample.

The data used in our analysis come from the eight waves of the European Community Household Panel, conducted annually from 1994 to 2001. Data from these waves were collected on the activity and income of individuals monitored in the eight countries selected

[3] This work is based on Ekert-Terraz (2005).

for this analysis (Belgium, Denmark, France, Ireland, Italy, Portugal, Spain, United Kingdom[4]).

Our variables are based on a calendar recording respondents' activity month by month. During the survey, they were asked to state their main activity for each month of the previous year, whether employment, training or unemployment. An individual is considered as "unemployed" if they report unemployment at some point in a month. We preferred this declaration option over the ILO's standard option because it is less restrictive. It enables us to understand more broadly the experience of people deprived of employment[5]. Moreover, taking account of the calendar enables us to follow individuals' situations month by month, so we do not miss any periods of unemployment. Such a situation might occur if the person is in employment at the time of the interview during two consecutive years. This approach thus limits the phenomenon of recall bias.

Table 1.1. Characteristics of persons who experienced unemployment in 1995

Countries	Men	Women	Under 25 years old	25-54 years old	55 years old and more	Unemployed for the entire year
Belgium	27.2%	72.8%	14.3%	74.1%	11.6%	60.9%
Denmark	35.6%	64.4%	14.4%	73.7%	11.9%	23.7%
France	48.2%	51.8%	25.9%	66.5%	7.6%	26.1%
Germany	45.9%	54.1%	13.2%	65.7%	21.1%	26.6%
Greece	38.9%	61.1%	28.0%	67.0%	5.0%	46.5%
Ireland	72.4%	27.6%	22.8%	70.3%	6.9%	55.0%
Italy	53.9%	46.1%	37.7%	59.1%	3.2%	62.7%
Portugal	45.3%	54.7%	26.7%	61.6%	11.6%	36.7%
Spain	55.1%	44.9%	24.3%	68.5%	7.2%	44.5%
United Kingdom	63.1%	36.9%	27.7%	60.0%	12.4%	20.8%
UE-10	50.7%	49.3%	25.4%	65.9%	8.7%	42.4%

Source : ECHP, Base : individuals having a period of unemployment in 1995.

Like Jacobson *et al.* (1993), we examine in this paper the consequences of unemployment on monthly wages, which include the effects of hourly wage and number of

[4] Since Austria and Finland did not participate in every wave, we do not examine them in our study. The Netherlands and Luxembourg are not included either, the former because the activity calendar variables are not recorded, and the latter because of the small sample and the small number of unemployed in this country. Sweden did not participate in the panel and Greece and Germany were excluded as the estimation results seemed not robust.

[5] This approach is not totally without bias either, since people find it easier to say they were unemployed in countries with a strong support system. However, self-reported unemployed over the age of 55 are very likely to be inactive *de facto* but usually register as unemployed in order to have access to early retirement schemes. Our estimations on a 16-54 year-old sub-sample do not yield significantly different impacts of unemployment on earnings.

hours worked[6]. Our variable is constructed by dividing the annual income for a given year by the reported number of months stated to have been worked spent in work that year.

For the eight countries, we use the information available from all eight waves. And since the information on the calendar of activity and income is given for year *t*+1 for the individual present in year *t*, we have 722,946 observations from 1994 to 2000. Taking only those under age 57 in the first year of the panel (1993), who are not students and have a complete calendar of activity, we are left with about 543,852 observations. Of these remaining respondents, 37,000 had a period of unemployment between 1994 and 2000. Their characteristics in 1995 are given in Table 1.1.

Construction of explanatory variables

In order to identify the effect of unemployment by country and gender, wage estimates are made by country and gender. The first explanatory variables are the standard socio-demographic characteristics (Mincer, 1974), such as educational qualifications, cohort and cohort-square, experience and experience-square, time worked (part-time or otherwise) and sector of activity (public or private). For a closer analysis of the impact of unemployment on wages, we add detail to this variable by distinguishing between various components: "non-experience", duration effect and long-term unemployment effect.

- *"Non-experience":* a period of unemployment is first a lack of occupational experience compared with the employed. The first effect of unemployment is the loss of experience it causes. Cumulative experience during the panel period is constructed from the activity calendar for each month in the year and supplemented by the number of years' potential experience from age at first job until first appearance in the panel. We then calculate for each year the average variable for the months worked, since this will determine the average wage for the year[7];
- *Duration of unemployment:* we also identify a further stigma due to unemployment by calculating the impact on potential wages of the past duration of unemployment. The loss of skills and wage prospects are likely to depend on both the existence and duration of unemployment. Here we seek to identify the influence of short-term

[6] As we concentrated on the calendar of activity to identify people who had been unemployed, it was not possible to analyse hourly wages. We therefore analyse the consequences of unemployment in the "broad sense".
[7] To allow for measurement errors, experience needs to be estimated over the entire sample—with or without mention of wages—from all the variables at each date (Dustman and Rocchina-Barrachina, 2007).

unemployment, lasting less than one year[8]. The activity calendar is used to construct this variable, by re-initialising it when the respondent has worked for a full year[9];

- *Long-term unemployment:* the calendar can also be used to see whether the people monitored had a period of long-term unemployment during the panel period. This information, supplemented by a question about long-term unemployment before appearing in the panel, gives us an indicative variable.

Since the ECHP is an unbalanced panel, the main problem with the data is attrition and missing values in an incomplete calendar for some 10% of respondents (table in Appendix 1). There are gaps that prevent us from accurately calculating experience and duration of last period of unemployment for all periods following the gap. We decided to estimate activity for each month in the gap from the average state observed during the 12 months before and after the gap.

We also tried to take account of a few drawbacks in the data. As the public sector variable was missing for wave 4 in Belgium, we assumed that if someone was working in this sector in the preceding and following waves, he/she was also working in the public sector in the missing wave.

In the United- Kingdom, due to changes in the questionnaire, there were a lot of missing values for part-time working. By convention, we defined part-time as working less than 30 hours a week. As part-time employment, experience and wage scarring may be correlated, we also performed regressions on full-time workers.

II. Estimation method

There are two important related econometric issues that need to be dealt with in this type of analysis. The first is to do with unobserved heterogeneity.

Unobserved individual heterogeneity: the future low earnings of the unemployed might also reflect their unobserved characteristics. The unemployed might, on average, have fewer social

[8] Our estimates show that there was no particular influence of duration of unemployment in excess of one year. Moreover long-term unemployment cannot clearly be distinguished from inactivity.

[9] As in the case of experience, we calculate the average value for the year. We also calculate the values of these variables for the first month worked in the year. We assume that someone whose duration of unemployment in the first month is higher than the average for the year keeps the penalty recorded in January for the entire year. The duration of unemployment used is therefore average value or value at 1 January, whichever is the higher. For example, for someone unemployed from September to December in year n and employed all year n+1, this value will be 4 months, or $^2/_3$ of a half-year. For someone who had another 8-month period in from April to November of year n+1, the value will be (4x3+8x1)/4=5 months, which will be compared to the average monthly wage calculated from the 4 months worked in year n+1.

networks, have more difficult labour market conditions, be less productive than the employed, or have a greater preference for leisure. These unobserved individual characteristics would then explain both the labour market situation and the wage earned.

Moreover, in the standard human capital model, returns to tenure and experience are interpreted as returns to specific and general human capital, respectively. But, as we have seen above, according to search models, a match between a firm and an individual will last longer if it is a "good" match, and more experienced workers would have had more time to find a good match. As a result, tenure and experience variables will be correlated with unobservable job-specific or match-specific variables and may lead to biased results that cast doubt on cross-section results (Chamberlain, 1982; Moulton, 1986). The possible correlation between the unobservables and the observables needs to be accounted for in the estimation of the parameters of interest. This will be done through two methods.

The panel data can be used to identify the correlation between the explanatory variables and the individual heterogeneity parameters by introducing individual fixed effects corresponding to the average values of the variables over the observation period (Mundlak, 1978). This is the generalisation of the "difference-in-difference" estimation that will enable us to recover the effect of an interruption by removing the common macro effects as well as the unobservable individual specific effects. We also need to allow for the effects of two further sources of bias. First, this procedure does not account for unobserved heterogeneity resulting from the quality of the match in the respondent's current job, that is time varying for each individual. And we must take into account the non-random selection of the sample.

Attrition bias: a simple regression of individual wages on the explanatory variables would produce biased estimated coefficients. By construction, we only observe earnings for individuals in employment who answered the questionnaire. The sample is thus selected by the labour market status and presence in the panel sample in the year in question. However, these are criteria which result from individual choice, decision to work, stay in the country, not move and not stop answering the questionnaire and so on, and are correlated with the specific unobserved heterogeneity. They will likely depend on education, family structure and, with respect to labour force participation, expected labour market earnings. The standard technique employed in these circumstances involves two steps (Heckman, 1979). First, a model to explain the probability of an individual being in the selected sample used in the estimation of the wages equation is estimated using a reduced form probit. Among the set of variables entering the selection equation, one also requires variables that influence the

probability of being in the sample, but not the observed wages conditional on being in the sample. In our case, the explanatory variables for the presence in the sample are education, and education-square, age and age-square, number of children aged 0-2, number of children aged 3-5, number of children under 15, presence of a spouse, their activity and wage, having 3 children or more, having worked in the public sector during the panel period, being a wife, a child living in their parent's home, living in an extended family. Second, a correction term is constructed using the generalised residuals (inverse Mills ratio) and used as an additional regressor in the wage equation to correct for the selection. The process is identified by exclusion variables – family and spouse situations - that explain the selection and do not explain the wages.

However, this procedure cannot be used to vary the effect of those variables that explain selection over time, although unobserved heterogeneity is also linked to the match, current job and selection, and also varies over time. Wooldridge proposes a method that consists of studying a fixed-effect model in which individual specific effects may be correlated with the explanatory variables of ***both*** equations in the model: the equation of interest explains wages and the selection equation. We use this method with the following explanatory variables for the selection equation.

In formal terms, the equations of the model are:

$$(1) \quad W_{it} = d_{it}.W_{it}^{*} = X_{it}.\beta + \mu_i + \eta_{it}, \quad i = 1,..., N, \quad t = 1,..., T$$

$$(2) \quad d_{it}^{*} = Z_{it}.\theta + \alpha_i + \upsilon_{it}$$

$d_{it} = 1$ if and only if $d_{it}^{*} \geq 0$

The logarithm of monthly wages in that year (W_{it}^{*}) is a latent variable only observed if the person is working ($d_{it} = 1$). In this model, β and θ are the values to be estimated and X_{it} and Z_{it} are vectors of explanatory variables where some elements, such as education, are common. For each of these equations, the global error term is broken down into a term representing individual specific effects (μ_i and α_i) and idiosyncratic terms (η_{it} and υ_{it}) which are not necessarily independent of each other.

As we have mentioned, the individual characteristics may be correlated with the explanatory variables. When seeking to estimate β, (1) has to be conditional on the result of the selection process equation.

However, since this condition may affect the unobserved determinants of wages and cause a selection bias, especially when the indicative variable d_{it} is not independent of individual fixed effects (μ_i) or chance (η_{it}). Namely,

(3) $E\{\mu_i + \eta_{it} / x_{it}, d_{it} = 1\} \neq 0$ for all *t*.

So the conditional expectation of the error term $\varepsilon_{it} = \mu_i + \eta_{it}$ is not zero. However, if expression (3) were known, it could be added to equation (1) and the parameters thus obtained estimated convergently by standard estimation methods.

Using the notation $u_{it} = \alpha_i + \nu_{it}$, Wooldridge (1995) considers the following alternative: $E\{\varepsilon_{it} / x_i, z_i, u_{it}\} = \tau_t\, u_{it} + x_i\psi$ where x_i and z_i represent vectors of x_{it} and z_{it}. As term u_{it} cannot be observed, but only the indicative variable d_{it} is observed, $E\{\varepsilon_{it} / x_i, z_i, u_{it}\}$ must be replaced by the expectation of ε_{it} where z_i and d_{it} are known. The result is :

$$E\{\varepsilon_{it} / x_i, z_i, d_{it}\} = \tau_t E\{u_{it} / x_i, z_i, d_{it}\} + x_i\psi$$

In this model, the condition expectation of u_{it} is the generalised residual of the selection equation $E\{u_{it} / x_i, z_i, d_{it}\} = \lambda_{it}$ where the λ_{it} represent the inverse Mills ratios for each *t*. Equation (1) is conditioned by the selection process and is expressed:

$$E\{y_{it} / x_i, z_i, d_{it}\} = x_i\psi + x_{it}\beta + \tau_t\lambda_{it}$$

The estimation method is the following : a probit model is estimated for each *t* to obtain λ_{it} values, then equation (1) is estimated by OLS by adding all the explanatory variables at the various dates and the error correction term for each period. The tests then account for correlation structure of the residuals[10].

III. Regression results

The estimations, calculated separately for men and women, are given in Tables 3.1 and 3.2, which indicate the values of the coefficients and the significance tests[11].

[10] Our method does not allow us to account for the possible endogeneity of unemployment on wages. When the first job is low paid, reflecting a low productivity of the worker, there might be more mobility across jobs, even with an unemployment period. As we are dealing with several indicators at the same time (experience, duration, past long-term unemployment), it is difficult for us to address this issue. Moreover, the existing literature does not simultaneously take into account the problems of attrition, unobserved heterogeneity and endogeneity. In particular, recent articles on this subject do not deal with attrition (Garcia-Perez and Rebello 2005; Arranz and alii 2010).

[11] Concerning the selection equations, the log likelihood ratio are about in the same range with respect to the number of observations.

Wage equations: general effects

In almost all countries, education, experience, part-time work and the sector of activity present values significantly different from zero at the 1% threshold.

The sector of activity is used as a control variable and has a greater effect for women than for men. Compared with the private tertiary sector, working in the public sector gives a wage bonus of 5% to 13% for women (except in Denmark), but a wage penalty for men. Working in the industrial sector is also associated with higher incomes for women (except in Belgium and Denmark), whereas it is more diverse for men. For both sexes, working in the farm sector considerably reduces wages,[12] an effect that is particularly marked for women in Italy.

Education qualifications have much the same effect throughout Europe. Compared with a secondary school leaving certificate, lower qualifications reduce men's average wages by 10-15% and a higher education qualification increases them by 20%. Since the vast majority of men work full time, this is mainly an hourly wage effect. Portugal stands out. The wage gap between the highest and lowest qualifications is twice that of the country average (+57% for higher education, –37% for no secondary school leaving certificate). This may be connected to the relatively low wages of farm workers and other unqualified workers in that country. For women, lower qualifications reduce incomes by nearly 20% and higher qualifications generally increase incomes, but to a lesser extent than for men. Obviously, the effect of education on women incomes encompasses hourly wages and working time effects.

In general terms, experience has a significantly positive effect and is particularly rewarded in the United Kingdom and Ireland. For men, this large experience effect goes together with a large cohort effect, evidence of advantages acquired during their careers. Elsewhere, the experience and cohort effects vary by country and gender. For men, experience has a lower effect in southern European countries and France.

[12] This is not true for women in France.

Table 3.2 Male Wage Equations

Explanatory variables	Nordic and Continental countries			Anglo-saxon countries		South of Europe		
	Belgium	Denmark	France	United-Kingdom	Ireland	Italy	Portugal	Spain
Constant	6.5528***	6.0950***	6.2083***	6.0220***	5.8238***	6.6830***	6.1971***	6.4103***
Lowereducation	-0.0997***	-0.1049***	-0.1400***	-0.1476***	-0.0945***	-0.1742***	-0.3690***	-0.1755****
Highereducation	0.2022***	0.1807***	0.4011***	0.1594***	0.1952***	0.3228***	0.5785***	0.2500****
Experience	0.0095**	0.0192***	0.0067***	0.0289***	0.0191***	0.0092***	0.0155***	0.0073***
Experience-squared	-0.0001***	-0.0002***	-0.0001***	-0.0002***	-0.0002***	-0.0000***	-0.0001***	-0.0001***
Part-Time	-0.1969***	-0.2537***	-0.1845***	-0.2890***	-0.2419***	-0.1220***	-0.1959**	-0.1544***
PublicSector	-0.0855***	-0.1183***	-0.1122***	-0.1675***	-0.0743***	-0.1024***	-0.1278***	-0.0600***
Agriculture	-0.0205	-0.1348***	-0.2351***	-0.2099***	-0.2051***	-0.1340***	-0.3338***	-0.3074***
Industry	0.0256**	-0.0243***	0.0075	-0.0198**	0.0852***	-0.0026	-0.0764***	0.0346***
Duration of latest unemployment period	-0.0388*	0.0043	-0.0629***	-0.1553***	-0.0698***	-0.0799***	-0.0381*	-0.0480***
Dummy1995	0.0047	0.0858	0.1022**	0.0335	0.0822**	0.0238	0.0058	0.0328
Dummy 1996	0.0226	0.2173***	0.1553***	0.2168***	0.1650***	0.1041***	0.0633	-0.0179
Dummy 1997	0.0694	0.3328***	0.1487***	0.2207***	0.1786***	0.0909***	0.0084	0.0841**
Dummy 1998	0.0769*	0.2029***	0.1579***	0.2426***	0.2471***	0.1234***	0.1218**	0.1183***
Dummy 1999	0.1578***	0.3650***	0.2409***	0.2079***	0.2988***	0.1585***	0.1376**	0.1931***
Dummy 2000	0.1506***	0.3856***	0.3282***	0.2356***	0.3073***	0.1202***	0.1157*	0.1630***
Mills Ratio 1994	0.0039	0.0626***	0.2006***	0.1299***	0.1460***	0.1056***	0.1448***	0.1125***
Mills Ratio 1995	0.0099	0.0331	0.1574***	0.1053***	0.1042***	0.0854***	0.1406***	0.1003***
Mills Ratio 1996	0.0099	-0.0092	0.1374***	0.0441***	0.0982***	0.0477***	0.1227***	0.1166***
Mills Ratio 1997	0.0027	-0.0414***	0.1494***	0.0567***	0.1170***	0.0627***	0.1695***	0.0960***
Mills Ratio 1998	0.0034	0.0182	0.1565***	0.0464***	0.1061***	0.0555***	0.1175***	0.0909***
Mills Ratio 1999	-0.0121	-0.0343***	0.1620***	0.0801***	0.1217***	0.0482***	0.1135***	0.0578***
Mills Ratio 2000	0.0026	-0.0386**	0.1348***	0.0936***	0.1415***	0.0648***	0.1421***	0.0865***
Cohort (agein 1993)	0.0090	0.0304***	-0.0040	0.0431***	0.0392***	0.0025	-0.0031	0.0011***
Cohort (agein 1993 squared)	0.0002***	-0.0001*	0.0004***	-0.0003149***	-0.0003***	0.0000	0.0002***	0.0002***
MeanExperience	-0.0048	-0.0129***	0.0003	-0.0271***	-0.0127***	-0.0044**	-0.0011	0.0016
MeanExperiencesquared	-0.0000	0.0001***	-0.0000	0.0002031***	0.0001***	0.0000	-0.0000	-0.0000
Mean Part-Time	-0.5864***	-0.6140***	-0.7480***	-0.6682***	-0.4456***	-0.8633***	-0.5242***	-0.5931***
Meannumber of children	0.0423***	0.0133***	0.0177***	0.0585***	0.0539***	0.0206***	-0.0104	0.0309***
Mean Duration of Unemployment	-0.1530***	-0.1161***	-0.2227***	-0.2365***	-0.1130***	-0.1414***	-0.0983***	-0.1592***
Mean Long-termUnemployment	-0.1534***	-0.0805***	-0.0850***	-0.1943***	-0.1310***	-0.0823***	-0.1052***	-0.0782***
R-squared	41	39	50	41	53	41	50	48
Number of observations	7 649	7 221	17 128	10 738	7 541	16 859	11 855	14 924

Table 3.2 Female Wage Equations

Explanatory variables	Nordic and Continental countries			Anglo-saxon countries		South of Europe		
	Belgium	Denmark	France	United-Kingdom	Ireland	Italy	Portugal	Spain
Constant	6.3436***	5.8829***	5.8590***	6.6708***	6.6505***	6.6494***	6.1245***	6.0162***
Lower education	-0.1486***	-0.1005***	-0.2009***	-0.1830***	-0.1987***	-0.2392***	-0.4784***	-0.2199***
Higher education	0.1867***	0.1170***	0.2870***	0.1562***	0.2825***	0.1726***	0.4382***	0.2755***
Experience	0.0127*	0.0197***	0.0017	0.0596***	0.0316***	0.0196***	0.0157***	0.0183***
Experience-squared	-0.0000	-0.0002***	-0.0000	-0.0001***	-0.0002***	-0.0001***	-0.0000	-0.0001***
Part-Time	-0.1623***	-0.1672***	-0.2017***	-0.5231***	-0.2892***	-0.1108***	-0.2373***	-0.1857***
PublicSector	0.0508**	-0.0689***	0.0867***	0.1314***	0.0563**	0.1085***	0.1012***	0.0851***
Agriculture	-0.1443	-0.0396	0.0714**	-0.2113**	-0.2752**	-0.4034***	-0.0788**	-0.1670***
Industry	0.0187	0.0057	0.1961***	0.1586***	0.1757***	0.0890***	0.0409***	0.0869***
Duration of latest unemployment period	-0.0703***	0.0136	-0.0401***	-0.0682**	-0.0594***	-0.0065	-0.0455**	-0.0620***
Dummy1995	0.0148	0.0621	0.0031	-0.0635	0.0308	0.0137	0.0775	0.0529*
Dummy 1996	-0.0247	0.0851**	0.0005	-0.1257**	-0.0124	0.0167	0.0456	0.0211
Dummy 1997	0.0291	0.1010*	0.0123	-0.1358**	-0.0068	0.0755***	0.0539	0.0365
Dummy 1998	-0.0165	0.0899**	0.0114	-0.1895***	0.0490	0.0281	0.0726	0.0041
Dummy 1999	0.0146	0.0890*	0.0570	-0.2326***	0.1117**	0.0500	0.1027	0.0749**
Dummy 2000	0.0234	0.1179*	0.0530	-0.2133***	0.1410**	0.0093	0.0681	0.0172
Mills Ratio 1994	0.0145	0.0395*	0.0988***	0.1001***	0.1690***	0.0751***	0.1620***	0.0887***
Mills Ratio 1995	0.0112	0.0222	0.0826***	0.1137***	0.1284***	0.0354***	0.1243***	0.0552***
Mills Ratio 1996	0.0291	0.0220	0.0878***	0.1063***	0.1309***	0.0349***	0.1467***	0.0568***
Mills Ratio 1997	0.0012	0.0299	0.0985***	0.0911***	0.1481***	0.0091	0.1393***	0.0758***
Mills Ratio 1998	0.0110	0.0448**	0.0992***	0.0858***	0.1065***	0.0207*	0.1115***	0.0900***
Mills Ratio 1999	0.0138	0.0474**	0.1084***	0.1075***	0.1345***	0.0069	0.0919***	0.0968***
Mills Ratio 2000	0.0060	0.0381	0.1256***	0.1044***	0.1351***	0.0291**	0.1193***	0.1235***
Cohorte (age in 1993)	0.0270**	0.0460***	0.0345***	0.0048	-0.0234**	0.0031	-0.0028	0.0221***
Cohorte (age in 1993 squared)	-0.0002	-0.0005***	-0.0002***	-0.000015	0.0003**	-0.0000	0.0001	-0.0002***
Mean Experience	-0.0094	-0.0180***	-0.0006	-0.0489***	-0.0143**	-0.0115***	0.0007	-0.0076
Mean Experience squared	0.0000	0.0001***	-0.0000**	0.0000251	0.0000	0.0000	-0.0001***	0.0000
Mean Part-Time	-0.4323***	-0.3371***	-0.5531***	-0.3849***	-0.4161***	-0.4373***	-0.5178***	-0.5218***
Mean number of children	-0.0041	0.0039	-0.0098	-0.08009***	0.0172**	-0.0323***	-0.0280*	0.0052
Mean Duration of Unemployment	-0.1269***	-0.0483**	-0.1487***	-0.18617***	-0.0086	-0.1422***	-0.0462*	-0.0700***
Mean Long-termUnemployment	-0.1235***	-0.1488***	-0.2191***	-0.23780***	-0.0633**	-0.1272***	-0.0984***	-0.0875***
R-squared	43	34	45	48	53	41	59	53
Number of observations	6 649	7 086	15 304	12 920	5 890	12 155	9 952	9 64

Our unusually high coefficient of experience for women in the UK could be explained by measurement errors on part-time employment and by the existence of interaction effects between part-time work and experience. Our sample confirms this, as we observe that experience increases steadily for women working full-time but not for women working part-time. A part of the high coefficient on part-time thus accounts for higher earnings of full-time workers.

An unemployment period generally has a negative impact on both women's and men's wages. For men, the loss is over 15% in UK, and from 4% to 8% elsewhere, except in Denmark[13]. Perhaps the loss of skills or the stigma attached to unemployment are less marked in this country than in the others. For women, unemployment also leaves its mark and the penalty ranges from 4% to 7%. Once again, the effect of unemployment is not significant in Denmark but also in Italy.

Impact of unemployment on men's wages

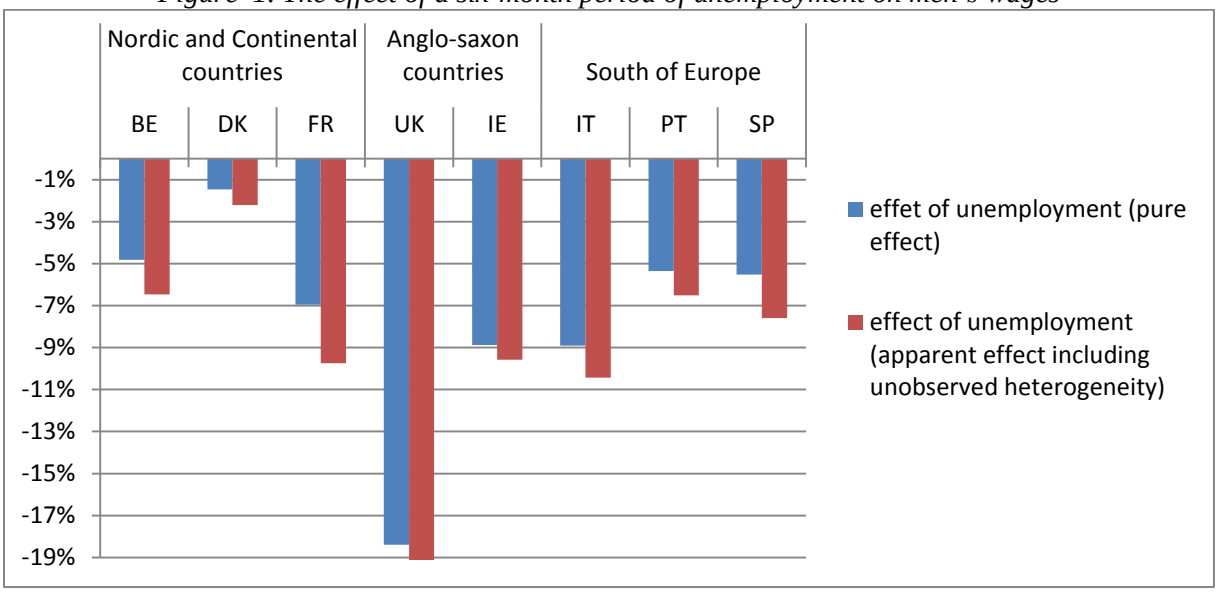
We examined various possible effects of unemployment on the wages of people who return to work: lack of experience, short or long periods of unemployment, duration of short term periods of unemployment.

The graph below summarizes these points by simulating the impact on wages of a single six-month period of unemployment. Some of the variables were found to be non-relevant. For example, the non-significant dummy variable "had a long period of unemployment" was not included[14] but was integrated in the form of an average across the panel period, since it turned out that from the outset of their careers, those who had a year's unemployment at some point have below-average wages. We simulate the effect of six months' unemployment on wages in relative value, using the estimated coefficients for the duration and experience variables, which we call the pure effect. The apparent effect includes, in addition to the two previous ones, the impact of unobserved heterogeneity specific to the individual, based on variable averages.

[13] Its magnitude equal to 4% is significant only at the threshold of 9% in Portugal and in Belgium

[14] Various estimations were run but it turned out that a long period of unemployment in the past and its duration had little effect.

Figure 1. The effect of a six-month period of unemployment on men's wages



In the eight countries under study, unemployment has a negative effect on men's wages. This echoes the result found in the English-speaking countries. The wage penalty related to unemployment is confirmed in a panel of European countries, even with the broader definition of unemployment we adopted. But the effect varies by country. The United Kingdom stands out clearly. The simulation of six months' unemployment reduces wages by 18%, whereas the effect is between 5% and 9% in most other European countries. These findings appear to tie in with the English-language literature, which points out the relatively large effect of unemployment in the most flexible economies. At the other extreme, the effect is lower in Denmark.

Unemployed men in the UK appear to combine various handicaps: having been unemployed (–15%) plus a large effect of loss of experience (–3%). This combination of handicaps is also found in Ireland, but only to half the extent of the UK (–9%).

Table 3.3 Sources of wage penalty for men

Specific effect of past unemployment	Low penalty	Medium penalty	High penalty
No	Denmark (1%) Belgium (5%) Portugal (5%)		
Yes		Spain (6%) France (7%) Ireland (9%) Italy (9%)	United Kingdom (18%)

In the countries with a low wage penalty (Denmark and to a lesser extent Belgium and Portugal), the wage penalty is mainly due to the loss of experience, the duration effect being only significant at the 9% threshold in the last two countries[15]. Elsewhere, the fact of having been unemployed is the main source of the wage penalty. So the wage penalty varies not only in size but also in causes.

A period of more than a year's unemployment in previous years has no effect in any of the eight countries. The long-term unemployed do not see a further reduction in wages when they return to work after a long period of unemployment in addition to the impact of "short-term" unemployment of up to a year. However, these workers already had lower wages when they appeared in the panel, to a varying extent by country[16]. The method we adopted makes it possible to examine the effects of individual-specific heterogeneity parameters. Those who, on average, have already been or will be unemployed for a long period already have lower wages (20% reduction in the United Kingdom, 13% in Ireland and also 15% in Belgium and 10% in Portugal where there is a small unemployment effect). Elsewhere this wage reduction is about 8%. Furthermore, these long-term unemployed were often included, during their unemployment exceeding one year, among the non-selected people whose average wages for the year were unknown, because they had either dropped out, left the labour market or were long-term unemployed. Here the positive Mills ratio coefficients[17] that express selection has around the same magnitude as this considerable negative effect[18].

The wages the unemployed may expect when they return to work is consequently the end result of this unemployment effect and structural effects (low qualifications, tertiary sector, heterogeneity). The latter effects are particularly large in France and Italy. In these countries, for example, unemployment does not bring a high wage penalty but structural effects ensure low potential wages for the unemployed.

Women are not different

Unemployment also has a detrimental effect on women's future monthly wages. A period of six months' unemployment has an effect, varying by country. It is very low in

[15] Nevertheless, the estimation of the effect of the last duration of the unemployment spell may be less robust for Belgium, since it is based on 243 men and 288 women with a full calendar year wage after an unemployment spell. The results concerning the very low effect of unemployment on earnings in Denmark are based on around 374 and 483 cases

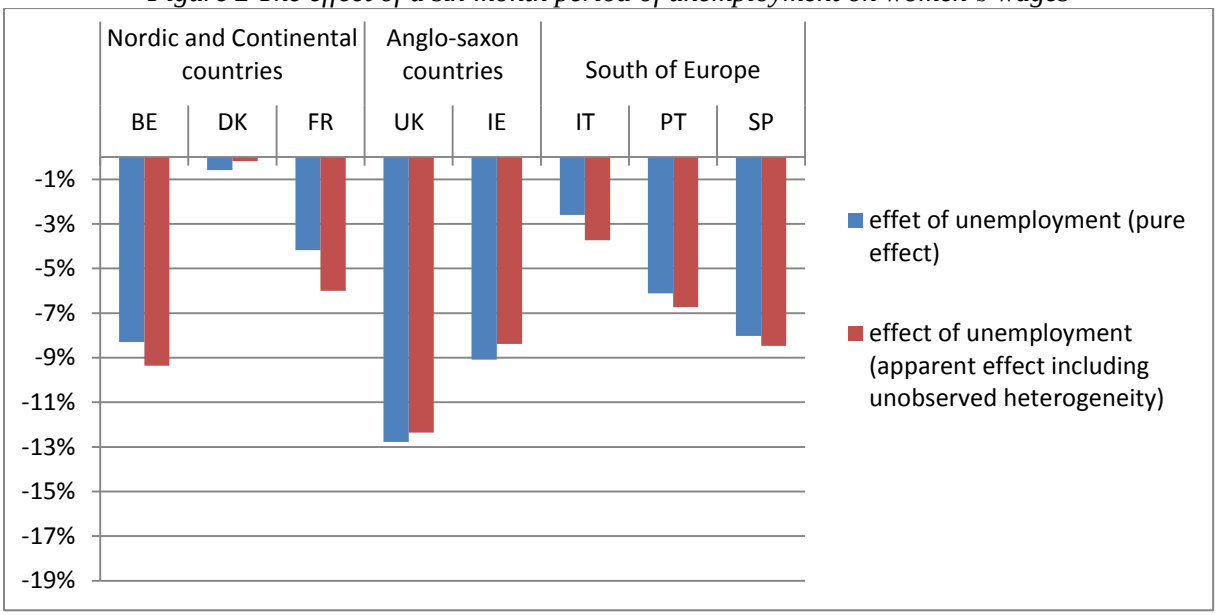
[16] This effect is noted by the average variable "mean long period of unemployment" for the whole panel.

[17] The Mills ratio coefficients are positive and indicate that the people selected have higher average wages than those not selected.

[18] Except in Denmark, Belgium, Italy and United Kingdom where the effect is smaller.

Denmark and Italy. It is low in France (4%) and ranges from 6% to 9% in the other European countries. The highest penalty is for women in UK (13%). The losses appear rather similar to those experienced by men, a result in line with what was obtained in the US (Couch and Placzek, 2010). In six of the countries considered, unemployment depresses wages, perhaps because of unemployment stigma or a loss of specific human capital.

Figure 2 The effect of a six-month period of unemployment on women's wages



Belgium stands out as there is a higher unemployment effect for women than for men. In this country, the women's wage penalty is 8% versus only 5% for men. On the contrary, in France and Italy, the effect is higher for men than for women. In Italy, fewer women find a job after unemployment and they experience a longer duration of unemployment than in other countries. Those in short term unemployment find less penalized jobs. Also, and the same is true in France, the reducing wage due to heterogeneity coefficient is especially high.

Table 3.4 Sources of wage penalty for women

Specific effect of past unemployment	Low penalty	Medium penalty	High penalty
No	Denmark (1%) Italy (3%)		
Yes	France (4%)	Portugal (6%) Spain (8%) Belgium (8%) Ireland (9%)	United-Kingdom (13%)

The women affected by long-term unemployment are also those whose wages were already below average. This is the same finding as for men. The reduction is more than 20% in the United Kingdom and France, some 15% in Denmark and around 12% in Belgium and Italy. Elsewhere it is between 6% and 10%. The heterogeneity coefficients associated with long-term unemployment are also generally higher than those for selection by employment or attrition[19].

Robustness checking and discussion

To assess the validity of our results, we carried out a few robustness checks by running regressions on different subsamples. We also controlled the quality of our selection equation.

- Comparing first stage selection equations and goodness of fit

Undertaking separate estimations by country enables us to take into account the diversity of labor markets, and the contrasting effects of the explanatory variables (education, experience, switching to inactivity, gender dimensions across countries). However, this could introduce a problem of comparability. In this regard, we compare the results of the first stage probit equations which encompass endogenous selection for inactivity, attrition and long term unemployment (Appendix 2). As stated earlier, exclusion variables are related to household's demographic structure such as age, number of children, presence of a spouse and its earnings or co-residence with parents. The effect of explanatory variables differs slightly from one country to another, but the goodness of fit seems especially steady.

For men, the C test for percentage of concordant pairs ranges from 78% in Spain and 80% in Portugal, to 86% for the countries with the smallest sample (Belgium, Denmark and Ireland). For women, the same test ranges from 82% in Portugal, to 87% in Ireland and 88% in Belgium.

Comparing estimated and observed wages (Figure 3) also shows generally convincing results with regard to the quality of the fit. This is less true in Portugal and Italy from the fourth wave on. Nevertheless, the difference is less than 0.015.

[19] This is not true for Portugal, where inactivity is especially penalizing for the subsequent career.

Figure 3. Monthly earnings of men

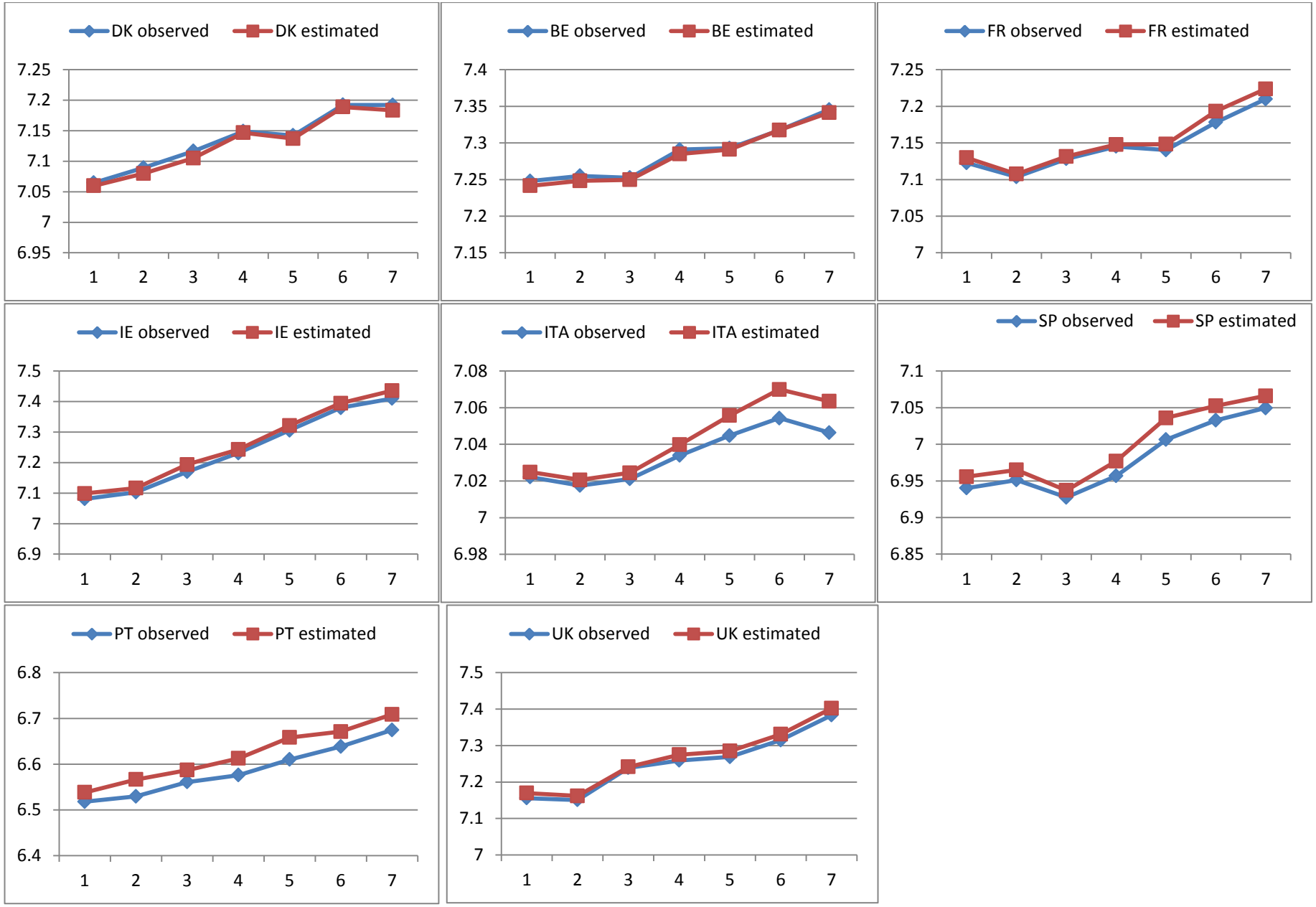
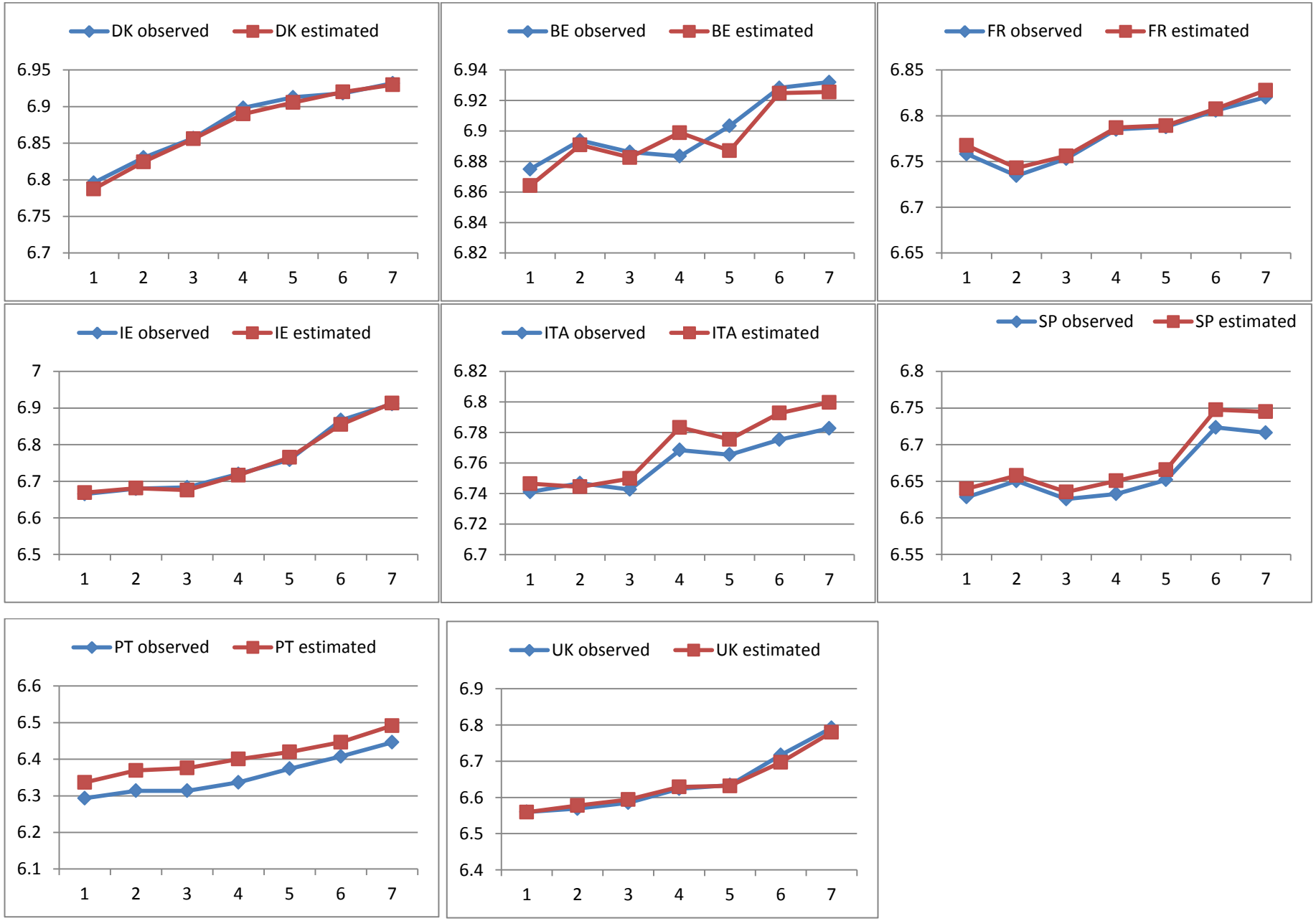


Figure 3. Monthly earnings of women



- Balanced versus unbalanced panel

We chose to work on an unbalanced panel. Comparing our results with those obtained on a balanced panel is a way of controlling for robustness and for the accuracy of the attrition treatment (Appendix 3). The results are rather similar. Concerning the general coefficients, some slight differences sometimes appear for the coefficients of agriculture (men in Denmark), industry (women in Ireland) or the public sector (women in Italy). But these are minor variations.

Concerning unemployment, the effect of the last short term duration of unemployment hardly varies between balanced and unbalanced estimations. Some slight variations appear on the coefficient of experience for men in UK and Portugal, but also for Portuguese and Spanish women. These variations do not alter the results we obtained (Table 3.5).

Table 3.5 Wage penalty for men and women - balanced panel

	Men			Women		
	Low penalty	Medium penalty	High penalty	Low penalty	Medium penalty	High penalty
No	DK (2%) BE (5%) PT(6%)			DK(1%) IT (3%)		
Yes		SP(5%) FR(7%) IE(9%) IT(10%)	UK(17%)	FR(4%)	PT(6%) SP(8%) BE(8%) IE(9%)	UK(13%)

- Women in full time job

We found that unemployment had a detrimental effect on women's future wages, of the same magnitude as the one found for men. But as more women are concerned by part-time work, this global effect of unemployment on monthly wages may be either explained by hourly wage effects or working time effect. Obviously, we consider that a reduced working-time after an unemployment period may be considered as a part of the wage scar. But as past unemployment, part-time employment and experience may be correlated, we made a regression on full-time working women. In our regression, we thus take account of women not reporting any month of part-time work. More precisely, once a woman experiences part-

time work, we discard all observations from the following waves. This artificial attrition is taken into account in our selection equation.

Table 3.6 Sources of wage penalty for women in full-time job

Specific effect of past unemployment	Low penalty	Medium penalty	High penalty
No	Denmark (1%) Italy (5%)		
Yes		Portugal (6%) United-Kingdom (6%) France (7%) Spain (9%) Belgium (9%)	Ireland (13%)

Concerning the scarring effect of unemployment on women working full-time, it appears to be lower in the United-Kingdom and higher in Ireland and France (Table 3.6) than on the full sample.

The experience effect is lower in the UK (1.6%) and in line with the coefficient obtained in other European countries. The effect of the duration of latest unemployment period also falls from 6% to 4%. This brings UK into the group of countries with a medium penalty for women. But we have to consider that only 51% of the women in the UK have never worked part-time during the panel. For part-time workers, experiencing unemployment in this country is bound to reduce hourly wage and working-time.

In Ireland and in France, part-time workers are less likely to reduce working time and their earnings may often be bound by minimum wages that are quite high. Unemployment is more frequent and therefore less a stigma than for full-time women. For all the other countries and all the coefficients of the model[20], the model estimated on full-time workers does not show results that are significantly different from the model estimated on the full sample.

The role of labour market institutions

In general, the unemployment penalty is more marked in the English-speaking countries. It is very low in Denmark.

But the effect of unemployment may vary from one country to another according to a number of determinants such as labour demand, educational policies and the like. It may also vary

[20] Except Mills ratios.

according to wage differentials, for example, or any other feature that modifies the workings of the labour market. In one of the few comparative analyses of workers made redundant, Kuhn (2002) specifically mentions the importance of labour market institutions to explain the differential impact of unemployment on either side of the Atlantic. In particular, he says, the organisation of unemployment benefits, the level of the minimum wage and trade union representation are likely to modify the wage penalty. We will therefore discuss our results with respect to these latter elements while recognizing that some other explanations may also be relevant.

Ceteris paribus, the level of unemployment benefits may influence re-hire wages. Polachek and Xiang (2006) find that more generous benefits exercise an upward pressure on such wages. But the allocation of these benefits also depends on eligibility criteria, in particular attempts to find work. Petrongolo (2009) shows, for example, that the stricter eligibility criteria in the British unemployment benefit system has increased the rate of coming off benefits but reduced the average wage level on re-hire.

In this way, the United Kingdom, where the unemployment penalty is high, combines a low level of benefits and therefore a low replacement rate (Table 3.6) with strict monitoring of attempts to find work. At the other extreme, unemployment benefits are high in Denmark and the unemployment effect is relatively low. In Belgium, unemployment effect varies by gender and is higher for women than for men. The unemployment effect is very low for men in Belgium, who generally receive unemployment benefits indefinitely. Women, more severely penalised by unemployment, generally have cohabiting status and receive lower benefits that may be suspended if unemployment persists. The Southern countries (Spain, Italy) pay benefits below the European average, although little effort is made to monitor job seeking (OECD, 2007). In these countries, the unemployment penalty is a bit less than 10%, except for women in Italy (3%) who are generally less concerned by short-term unemployment. For them, the coefficient on mean unemployment duration is large. The effect of unemployment on re-hire wages depends also more generally on the wage distribution (Table 3.7). Economies where wage differentials are wide are those where unemployment may considerably penalise wages. This distribution depends on both the level of the minimum wage and the strength of employee representative organisations (Kahn, 2011; Koeniger *and alii.*, 2007). The interdecile ratio in the lower half of the wage distribution (Decile 5/Decile1) is relatively low in Belgium and Denmark, where trade union membership and coverage are high and the unemployment effect fairly low. The ratio is high in Ireland and the United Kingdom, where the unemployment effect is higher.

Table 3.7. Wage distribution and elements of labour market institutions

Countries	Wage dispersion	Gross Replacement Rate	Women wage dispersion
	decile5 /decile1		decile5 /decile1
Belgium	1.38	39%	1.36
Denmark	1.51	58%	1.45
France	1.57	38%	1.54
Ireland	1.92	29%	1.74
Italy	1.65	25%	1.62
Portugal	1.64	38%	1.51
Spain	1.69	29%	1.65
United Kingdom	1.82	18%	1.70

Source : OECD, 2001 figures for decile ratios of gross earnings-
2004 figures Italy- 2003 figures for Ireland. Gross replacement rates, OECD

Finally, Continental and Southern countries lie somewhere in between Nordic and Anglo-Saxon countries with respect to wage dispersion and replacement rate characteristics. They are also generally found in countries with a medium penalty of unemployment. Of course, these few elements of labour market characteristics cannot explain the whole story. The level of the unemployment rate (Clark 2003) but also education and attachment to the labour market are other major determinants. But institutions of the labour market are elements of importance and can give us some hints as to why the unemployment penalty may differ between countries;

Short term unemployment reduces monthly earnings but differently from one country to another. We also found that women's earnings are also "scarred" by unemployment, with an earnings penalty of the same order of magnitude as the one found for men. Our article then offers a wider approach than the studies usually concentrating on men on the grounds that women are less attached to the labour market. Even if this is true, unemployment leaves its mark. Moreover, in three countries, the wage penalty differs if we restrict our sample to women working full-time. This may be related to dual labour market functioning for women. In France and Ireland, career women may suffer more from unemployment than women working part-time.

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APPENDIX 1.

Countries	Persons with a complete calendar of activity (%)
Belgium	90.7%
Denmark	87.1%
France	82.4%
Ireland	96.9%
Italy	92.0%
Spain	87.7%
Portugal	91.3%
United Kingdom	94.0%

APPENDIX 2
Probability of being present – Men – wave=3

Explanatory variables	Belgium	Denmark	France	United-Kingdom	Ireland	Italy	Portugal	Spain
Constant	-3.6820***	0.8920	-1.5252***	-0.5787	3.2772***	-1.9934***	0.4027	-0.3245
Lower education	-0.4020***	-0.4273***	-0.2717***	-0.2249**	-1.0624***	-0.2691***	-0.1004	-0.1444
Higher education	0.0317	0.2746	0.1747	0.3394***	0.2751	0.1036	0.8342***	0.2689**
Age	0.2642***	0.0184	0.1656***	0.1197***	-0.0846***	0.2007***	0.0789***	0.1060***
Age squared	-0.0036***	-0.0005	-0.0025***	-0.0019***	0.0006	-0.0029***	-0.0016***	-0.0017***
Number of children								
under 3 years olds	0.1536	0.6555*	-0.1705	-0.2497	-0.0909	0.0835	0.3794*	-0.1213
between 3 and 6 years old	-0.0679	0.2022	0.2649	-0.0383	-0.1103	0.1100	-0.0240	0.1785
between 6 and 15 years old	0.0003	0.1992	-0.0015	-0.1805*	0.0800	0.0894	0.5317***	-0.1202**
Active husband	-0.0070	0.5590	-0.2208	-0.2241	-0.1350	0.6588**	0.2580	0.0971
Husband's earnings	0.0533	0.0587	0.0712**	0.1188**	0.0846*	-0.0471	-0.0210	-0.0209
Three children	-0.6224*	-1.7277***	-0.4780*	-0.2054	-0.4921**	-0.0881	-1.5943***	-0.2984
Presence of husband	0.3366*	0.1766	0.4265***	-0.1044	0.2389	-0.0749	0.4552***	0.2890**
Work in the public sector	1.6891***	0.8831***	1.3927***	2.0213***	2.3572***	2.1255***	1.2627***	1.4885***
Single parent with children	0.5284	-0.4113	0.2361	-1.0058***	0.1587	0.0136	2.2306**	-0.2168
Young adult living with parents	0.3415	0.1095	-0.4790***	-0.0153	-0.3678**	-0.9268***	-0.3685**	-0.7892***
Complex households	-0.6549	20.6278	-0.9656**	-0.6977	-0.7436*	-0.6550	0.7950**	-0.4493**
N	1406	1217	3006	1883	1487	3477	2100	2833
Log Likelihood	-441	-271	-851	-602	-616	-1282	-669	-1242
Percentage concordant: C test[21]	0.86	0.86	0.85	0.82	0.86	0.84	0.80	0.78

[21] $C = (n_c + 0{,}5(t - n_c - n_d))/t$ with n_c = number of concordant pairs, n_d number of discordant pairs , t number of pairs with different observed values of Y.

Probability of being present – Women –wave=3

Explanatory variables	Belgium	Denmark	France	United-Kingdom	Ireland	Italy	Portugal	Spain
Constant	-0.6393	0.0386	0.4390	0.2458	1.6357***	-1.2788***	1.8790***	-0.2559
Lower education	-0.4802***	-0.5296***	-0.4547***	0.0796	-0.5802***	-0.3859***	-0.4147***	-0.5874***
Higher education	0.7108***	0.2795*	0.2585***	0.1277	0.2258	0.0197	-0.0434	0.0554
Age	0.1106***	0.0582	0.0822***	0.0624**	0.0033	0.1389***	0.0210	0.0970***
Age squared	-0.0021***	-0.0010**	-0.0015***	-0.0012***	-0.0008**	-0.0023***	-0.0009***	-0.0018***
Number of children								
under 3 years olds	-0.7897***	-0.4394*	-0.3864***	-1.0247***	-0.7772***	-0.3926***	-0.1432	-0.6089***
between 3 and 6 years old	-0.2055	-0.3703	-0.5178***	-0.3667**	-0.5027***	-0.3581***	-0.2778*	-0.5183***
between 6 and 15 years old	-0.4059***	0.0311	-0.1884***	-0.3044***	-0.3782***	-0.3548***	-0.1547**	-0.3990***
Active husband	0.2763	0.3860	0.4375*	1.0910***	0.3372	0.0837	-0.4301**	-0.1939
Husband's earnings	0.0405	0.0591	-0.0169	-0.0049	0.0198	-0.0218	0.0315	-0.0221
Three children	-0.0884	-0.5038	-0.6259***	0.0154	0.2992	0.2244	0.2840	0.6327***
Presence of husband	-0.3978**	-0.4903*	-0.6197***	-0.7393***	-0.5154***	-0.3714***	-0.2642	-0.0770
Work in the public sector	2.3162***	1.5303***	2.1861***	2.2342***	2.9883***	3.2873***	2.0098***	3.4433***
Single parent with children	0.1221	-0.1003	-0.1440	-0.5171***	-0.0983	0.1462	0.1291	0.3803**
Young adult living with parents	-0.1590	-0.0885	-0.9539***	0.1815	-0.0114	-0.6499***	-0.6169***	-0.5207***
Complex households	-0.7613	12.6651**	-0.5416	-1.1059	-0.4618	-0.1594	-0.9381***	-0.3198
N	1648	1285	3346	2621	1916	4346	2470	3382
Log Likelihood	-648	-413	-1439	-1142	-912	-1977	-1248	-1659
Percentage concordant: C test	0.88	0.85	0.84	0.83	0.87	0.84	0.82	0.84

APPENDIX 3.

Male Wage Equations (balanced panel)

Explanatory variables	Nordic and Continental countries			Anglo-saxon countries		South of Europe		
	Belgium	Denmark	France	United-Kingdom	Ireland	Italy	Portugal	Spain
Constant	6.3984***	6.1915***	6.2631***	6.0082***	5.8941***	6.6975***	6.3480***	6.3670***
Lowereducation	-0.0910***	-0.1057***	-0.1434***	-0.1434***	-0.0917***	-0.1779***	-0.3883***	-0.1843***
Highereducation	0.1844***	0.1728***	0.3957***	0.1546***	0.2055***	0.3265***	0.5703***	0.2469***
Experience	0.0057	0.0206***	0.0065***	0.0192***	0.0203***	0.0091***	0.0229***	0.0051
Experience-squared	-0.0001***	-0.0002***	-0.0001***	-0.0002***	-0.0002***	-0.0000***	-0.0001***	-0.0000***
Part-Time	-0.1940***	-0.2844***	-0.1870***	-0.2735***	-0.2452***	-0.1249***	-0.1364	-0.1377**
PublicSector	-0.0870***	-0.1215***	-0.1010***	-0.1707***	-0.0799***	-0.0951***	-0.1298***	-0.0677***
Agriculture	-0.0399	-0.1483***	-0.2451***	-0.2203***	-0.2051***	-0.1262***	-0.3254***	-0.3340***
Industry	0.0249**	-0.0302***	0.0051	-0.0243**	0.0847***	0.0009	-0.0723***	0.0404***
Duration of latest unemployment period	-0.0403*	-0.0004	-0.0669***	-0.1547***	-0.0716***	-0.0868***	-0.0356	-0.0475***
Dummy1995	0.0323	0.0628	0.0818**	0.0401	0.0671*	0.0300	0.0264	0.0534
Dummy 1996	0.0257	0.2095***	0.1221***	0.2313***	0.1497***	0.1051***	0.0541	-0.0206
Dummy 1997	0.0714	0.2940***	0.1069**	0.2502***	0.1623***	0.1047***	-0.0562	0.0964**
Dummy 1998	0.0913**	0.1983***	0.1185***	0.2726***	0.2386***	0.1234***	0.0428	0.1085***
Dummy 1999	0.2078***	0.3243***	0.1863***	0.2655***	0.2854***	0.1632***	0.0891	0.1989***
Dummy 2000	0.1675**	0.3318***	0.2766***	0.3186***	0.2829***	0.1366***	0.0419	0.1718***
Mills Ratio 1994	0.0058	0.0594***	0.1701***	0.1247***	0.1453***	0.1053***	0.1369***	0.1079***
Mills Ratio 1995	0.0031	0.0344*	0.1359***	0.1030***	0.1087***	0.0816***	0.1199***	0.0879***
Mills Ratio 1996	0.0132	-0.0126	0.1229***	0.0469***	0.1021***	0.0448***	0.1079***	0.1193***
Mills Ratio 1997	0.0082	-0.0345**	0.1385***	0.0606***	0.1220***	0.0542***	0.1781***	0.0876***
Mills Ratio 1998	0.0082	0.0115	0.1426***	0.0569***	0.1043***	0.0535***	0.1258***	0.0943***
Mills Ratio 1999	-0.0204	-0.0278***	0.1575***	0.0862***	0.1221***	0.0465***	0.0985***	0.0574***
Mills Ratio 2000	0.0088	-0.0287	0.1289***	0.0943***	0.1448***	0.0569***	0.1374***	0.0855***
Cohorte (agein 1993)	0.0179**	0.0256***	-0.0028	0.0418***	0.0344***	0.0015	-0.0102	0.0043
Cohorte (agein 1993 squared)	0.0002**	-0.0001	0.0004***	-0.0002***	-0.0002**	0.0000	0.0004***	0.0001**
MeanExperience	-0.0038	-0.0139***	0.0006	-0.0178***	-0.0128***	-0.0038	-0.0074	0.0034
MeanExperiencesquared	-0.0000	0.0001***	-0.0000*	0.0001***	0.0001***	0.0000	-0.0000	-0.0000
Mean Part-Time	-0.5208***	-0.6110***	-0.7538***	-0.6686***	-0.4216***	-0.8411***	-0.6112***	-0.6179***
Meannumber of children	0.0464***	0.0136***	0.0139***	0.0614***	0.0553***	0.0165***	0.0048	0.0339***
Mean Duration of Unemployment	-0.1596***	-0.1276***	-0.2243***	-0.23440***	-0.1129***	-0.1424***	-0.0875**	-0.1634***
Mean Long-termUnemployment	-0.1491***	-0.0760***	-0.0782***	-0.20991***	-0.1377***	-0.0849***	-0.1321***	-0.0861***
R-squared	41	38	50	41	53	41	49	48
Number of observations	6 854	6 331	16 105	9 949	7 142	15 376	10 386	12 485

Female Wage Equations (balanced panel)

Explanatory variables	Nordic and Continental countries			Anglo-Saxon countries		South of Europe		
	Belgium	Denmark	France	United-Kingdom	Ireland	Italy	Portugal	Spain
Constant	6.2962***	5.9092***	5.9094***	6.7804***	6.6758***	6.6722***	6.2680***	5.9961***
Lower education	-0.1593***	-0.0923***	-0.2056***	-0.1788***	-0.2023***	-0.2426***	-0.4859***	-0.2332***
Higher education	0.1823***	0.1146***	0.2899***	0.1647***	0.2843***	0.1692***	0.4396***	0.2808***
Experience	0.0144***	0.0188***	0.0021	0.0632***	0.0375***	0.0210***	0.0249***	0.0280***
Experience-squared	-0.0000	-0.0001***	-0.0000	-0.0001***	-0.0002***	-0.0001***	-0.0000	-0.0002***
Part-Time	-0.1626***	-0.1687***	-0.2049***	-0.5175***	-0.2879***	-0.1139***	-0.2558***	-0.1931***
Public Sector	0.0474**	-0.0738***	0.0923***	0.1452***	0.0603**	0.1213***	0.1204***	0.0987***
Agriculture	-0.1299	-0.0472	0.0781**	-0.1695**	-0.2719**	-0.3935***	-0.0796**	-0.1238***
Industry	0.0232	0.0123	0.1925***	0.1684***	0.1841***	0.0910***	0.0323**	0.0863***
Duration of latest unemployment period	-0.0754***	0.0191	-0.0404***	-0.0577*	-0.0612***	-0.0085	-0.0477**	-0.0616***
Dummy1995	-0.0046	0.0491	0.0006	-0.0650	0.0240	0.0163	0.0430	0.0460
Dummy 1996	-0.0486	0.1010**	-0.0011	-0.1371**	-0.0323	0.0143	-0.0181	0.0303
Dummy 1997	-0.0004	0.0821	-0.0032	-0.1552**	-0.0224	0.0703**	-0.0456	0.0370
Dummy 1998	-0.0419	0.0916*	-0.0052	-0.2114***	0.0134	0.0273	-0.0030	0.0036
Dummy 1999	-0.0170	0.0772	0.0647	-0.2600***	0.0738	0.0440	0.0094	0.0483
Dummy 2000	-0.0172	0.1086	0.0630	-0.2361***	0.0874*	-0.0024	-0.0097	0.0250
Mills Ratio 1994	0.0146	0.0499**	0.1001***	0.0917***	0.1660***	0.0712***	0.1178***	0.0831***
Mills Ratio 1995	0.0160	0.0368	0.0829***	0.1024***	0.1302***	0.0295**	0.1081***	0.0471***
Mills Ratio 1996	0.0298*	0.0219	0.0879***	0.0987***	0.1307***	0.0321***	0.1379***	0.0413***
Mills Ratio 1997	0.0060	0.0445*	0.1036***	0.0825***	0.1443***	0.0067	0.1418***	0.0545***
Mills Ratio 1998	0.0137	0.0471**	0.1050***	0.0772***	0.1054***	0.0163	0.0882***	0.0773***
Mills Ratio 1999	0.0207	0.0550**	0.1049***	0.0966***	0.1323***	0.0058	0.0670***	0.0827***
Mills Ratio 2000	0.0128	0.0471*	0.1192***	0.0897***	0.1316***	0.0253	0.0731**	0.0653***
Cohorte (age in 1993)	0.0309**	0.0437***	0.0312***	-0.0020	-0.0242**	0.0016	-0.0049	0.0240***
Cohorte (age in 1993 squared)	-0.0003	-0.0004***	-0.0002***	0.0000	0.0003**	-0.0000	0.0001	-0.0002***
Mean Experience	-0.0113**	-0.0166***	-0.0008	-0.0502***	-0.0192***	-0.0119***	-0.0082	-0.0170***
Mean Experience squared	0.0000	0.0001***	-0.0000*	0.0000	0.0000	0.0000	-0.0001***	0.0001**
Mean Part-Time	-0.4276***	-0.3353***	-0.5433***	-0.4032***	-0.4204***	-0.4359***	-0.4907***	-0.5235***
Mean number of children	-0.0046	0.0044	-0.0065	-0.0813***	0.0152**	-0.0329***	-0.0317*	0.0062
Mean Duration of Unemployment	-0.1068***	-0.0497*	-0.1575***	-0.1817***	-0.0076	-0.1443***	-0.04355	-0.0554***
Mean Long-termUnemployment	-0.1269***	-0.1409***	-0.2006***	-0.2511***	-0.0566*	-0.1187***	-0.08414***	-0.0924***
R-squared	43	34	46	48	54	41	58	51
Number of observations	6 044	6 306	15 539	12 115	5 626	11 035	8 895	7 954