



# DOES FLEXIBLE EMPLOYMENT PAY? EUROPEAN EVIDENCE ON THE WAGE PERSPECTIVES OF FEMALE WORKERS

IGA MAGDA, MONIKA POTOCZNA

NEUJOBS WORKING PAPER No. 16.3

MARCH 2014

## Abstract

The aim of this paper is to explore three issues relating to the financial dimension of female labour market outcomes. Firstly we analyze the gender pay differentials, adding to the existing literature an age - and distribution specific gender pay gaps. Next, we investigate the wage returns associated with two flexible types of employment, namely temporary and part time jobs. Our results show that flexible employment forms offer no consistent pattern of age-specific wage returns. Eastern and Western European countries differ in some aspects: young women in the former experience much larger pay gaps at the beginning of their working careers (compared to men), and their wage penalties associated with fixed term contracts tend to increase with age. Part time work appears to be beneficial mainly for the high paid women.

**Keywords:** gender, labour market, wages, gender wage gap, fixed term contracts, temporary work, part time work

**JEL Classification:** J16, J31



NEUJOBS Working Documents are intended to give an indication of work being conducted within the NEUJOBS research project and to stimulate reactions from other experts in the field. Texts published in this series are ultimately destined for academic publishing. The views expressed in this paper are those of the author and do not necessarily represent any institution with which he is affiliated. See the back page for more information about the NEUJOBS project.

Available for free downloading from the NEUJOBS website (<http://www.neujobs.eu>)

© IBS, 2014

# CONTENTS

---

1. Introduction .....	1
2. Women and wage returns .....	2
3. Data & methods .....	5
4. Results .....	8
4.1 Gender pay gap from a cohort perspective .....	8
4.2 Temporary employment and wages .....	11
4.3 Part time work returns - a premium or penalty? .....	12
5. Conclusions .....	15
6. References .....	17

# DOES FLEXIBLE EMPLOYMENT PAY?

## EUROPEAN EVIDENCE ON THE WAGE PERSPECTIVES OF FEMALE WORKERS

IGA MAGDA<sup>1</sup>

MONIKA POTOCZNA<sup>2</sup>

NEUJOBS WORKING PAPER NO. 16.3

JANUARY 2014

---

### 1. Introduction

Labour markets have experienced deep changes over the past two decades and they keep undergoing structural transformations. Firstly, there was a considerable inflow of women into the labour market, in particular among women in the prime age and older cohorts (Lewandowski, Magda, & Baran, 2013). Skill biased technological change, trade intensification due to globalization, IT revolution and institutional reforms all led to growing demand for better educated workers outpacing their supply, increasing earnings inequalities and worsening job prospects for the low skilled (Astor, Levy, & Murnane, 2003; Card & DiNardo, 2002). These major developments resulted in further changes, often being a result of policy response aiming at adopting labour markets to the new dynamics with more flexibility (Kahn, 2012). Among other, new forms of employment were introduced, less rigid than standard permanent job contracts and in several countries they took over large shares of the overall employment.

Several studies investigated the changing nature of jobs, aiming at answering the question how do they impact workers - in terms of their chances on the labour market, job quality, job satisfaction or incomes. Part time jobs are of particular interest from the perspective of female position on the labour market, as women are much more likely to be employed in these types of contracts, often for longer time periods (Bosch, Deelen, & Euwals, 2010). We are looking at the changing nature of the labour market from the perspective of its economic returns, that is wages. Female employment and its age dimension is of particular interest for us, therefore we start with analysing the distribution of gender pay gaps - linking the cohorts, countries and wage floor/ceilings perspectives. We then turn to looking at the wage perspectives of women in two types of "flexible" employment contracts, namely temporary and part time jobs. We are interested in verifying if and for whom these alternative forms of jobs contracts offer an

---

<sup>1</sup> Warsaw School of Economics and Institute for Structural Research, Warsaw

<sup>2</sup> Institute for Structural Research, Warsaw

individual wage bonus - or a wage penalty. In the final section we offer potential explanations and policy implications of our findings and ask questions for further research.

## 2. Women and wage returns

In recent decade, most European countries experienced a decrease in the gender wage gap but its size still varies considerably across countries (OECD, 2012a). The phenomenon of the gender wage differentials continues to be intensively researched, yet many questions on its correlates and causes remain open.

The reason for gender differences in the pay is a combination of economic, institutional and - to an unknown extent - discriminatory causes. Usually, a large share of the gap is explained by differences in individual characteristics, in particular productivity-related features (e. g. education and experience) and job characteristics (occupation, job level, firm size and sector) which impact the earnings of men and women to varying degrees, and as a result contribute to the gender pay gap. However, personal traits usually explain only a small part of the total wage gap (Christofides, Polycarpou, & Vrachimis, 2013). Career decisions, mainly shorter working hours among women and occupational segregation contribute to explain 30-60 % of the wage differential (Blau & Kahn, 1999; OECD, 2012a). Childbearing also increases the gap, which in general is low at the beginning of working careers and rises with job experience (Manning & Swaffield, 2008).

On the institutional side, several policies shape the outcomes of women on the labour market, including their wages. Labour market and family policies supporting the work-life balance and easier return to work after maternity leaves (such as childcare arrangements or flexible working time arrangements) may decrease the so-called motherhood penalty, which itself a puzzling phenomenon and it remains unclear to what extent it is related to mothers' productivity or to discrimination. There is some evidence that both men and women managers perceive women as having greater family-work conflict than men (Hoobler, Wayne, & Lemmon, 2009), which may affect the assessment of women's work organization and their productivity, and as a consequence it may have an effect on their earnings ((Alison L. Booth, 2009; A. Manning & Swaffield, 2008). Overall, there is evidence that countries with more efficient family - work policies are likely to exhibit lower pay gaps (OECD, 2012a). Finally, also wage setting mechanisms tend to impact the size of the gender pay differentials (Arulampalam, Booth, & Bryan, 2007).

The growing availability of linked employer - employee data enabled more in-depth investigation of the demand side and firm-level determinants of the gender pay gap. Several studies focused on the differences in its magnitude between the private and public sector, where it tends to be much lower (Cai & Liu, 2011; Cho, Cho, & Song,

2010). Indeed, firm - level policies are proved to be an important determinant of gender pay differences. For instance, Antonczyk, Fitzenberger & Sommerfeld (2010) find that workplace related effects (firm effects and bargaining characteristics) contribute to increases in the gender wage gap, whereas Meng & Meurs (2004) conclude that an interaction between decentralized wage bargaining and union presence in Australia narrows the gender earnings gaps compared to France. Furthermore, the presence of a works council or coverage by collective bargaining reduces the gender wage gap, although firm-level bargaining (as opposed to central level one) is more likely to narrow it alongside the entire wage distribution (Felgueroso, Perez-Villadóniga, & Prieto-Rodriguez, 2008).

Nevertheless, a large share of the gap remains unexplained (OECD, 2012a), which is due both to unobserved differences in characteristics between men and women and, potentially, to discriminatory policies. The "unexplained" factors are an area for further research. For instance, more and more studies focus on psychological explanations and the nature of behavioural differences between men and women, that lead to more career-based and competition-focused approach among men, resulting in higher wage returns. Booth (2009) summarizes several interesting findings in this respect). Therefore, the existence and extent of "pure" discrimination is very difficult to establish.

Interesting observations relate to the distribution of pay gaps among low and high paid earners. In OECD countries the highest gender wage gap is observed between males and females with tertiary education (OECD, 2012b) and thus it is usually higher at the top of the earnings distribution, reflecting the existence of the so-called "glass ceiling" (Albrecht, Bjorklund, & Vroman, 2003; Albrecht, van Vuuren, & Vroman, 2009; Arulampalam et al., 2007; Chzhen & Mumford, 2011; OECD, 2012a; Rica, Dolado, & Llorens, 2008). In some countries the gap is also higher than average at the low end of the wage distribution (a so-called "sticky floor" effect). In general, in central and northern European countries the pay gap increases alongside the wage distribution, irrespectively of educational attainment. In Spain and other southern countries (Greece, Italy) the pay gap is increasing with the wage distribution for higher educated persons and decreases for those with low educational attainment (Rica et al., 2008). Booth (2009) suggests, that the occurrence of the sticky floor may be due to the difference in the bargaining power of men and women. Women towards the bottom of wage distribution might have less bargaining power than comparable men, which may result from the unobservable social custom or family commitments whereby a man's career takes precedence. There are also hypothetical explanations of the glass ceiling phenomenon: working women may be less willing to respond to new job offers or to seek better-paid employment than men.

There are relatively few studies analysing the pay gap from a cohort perspective. The existing evidence suggests that the gender pay gap tends to increase with age (Barnard, 2008; OECD, 2012a). According to Manning & Swaffield (2008) in the United Kingdom the gender pay gap on entry to the labour market is approximately zero but it increases with every year of economic activity. It is partly related to the fact of having a child (OECD, 2012a). Indeed the gender gap is wider among workers with a child, than among childless persons. This phenomenon is called a 'motherhood penalty'. Another circumstance, that widens the gender pay gap is a marriage, that has strong positive impact on men's wage and does not influence women's earnings (Hewitt, Western, & Baxter, 2002)<sup>3</sup>.

#### *Part time & wages*

Another strand of literature that is of interest to us relates to the existence of a part time wage penalty (or a premium) among women (who constitute most of part time workers). Theoretical explanations of a part time wage penalties focus on the fixed costs of the employer and workers preferences to work part time - or lack of them - which are compensated for with lower wages (Hirsch, 2005). A great majority of studies find that women working part time are penalized in terms of (hourly) wages they are paid. When analysing female returns to part time work a wage penalty ranging from 10% to 20% is found (Gregory & Connolly, 2008), although some authors claim most of the observed gap is due to occupational segregation and once occupation is controlled for, the gap significantly lowers in size (Manning & Petrongolo, 2008). Interestingly, Booth & Wood (2008) find a part time wage premium for men and women in Australia, which they suspect to be explained by the compensating wage differentials theory and the fact that part time workers are less likely to benefit from paid holiday and sick pay entitlements. Hirsch (2005) finds significant part time pay gaps for men only. Part time jobs often reflect societal preferences (as in the case of the Netherlands - Bosch, Deelen, & Euwals, 2010) and this also shapes the wage premium attached to them, as workers who work part time involuntarily are more likely to be paid less than workers who work part time by preference (Barrett & Doiron, 2001). Interestingly, the issue of the variation in the existence and size of the gender wage premiums and penalties at different points of the wage distribution and different stages of the life course remains unexplored.

#### *Fixed term contracts & wages*

Theoretical predictions regarding temporary contracts offer expectations of a wage premium permanent jobs should offer, resulting from workers' enhanced bargaining position occasioned by firing costs (Blanchard & Landier, 2002). However, as pointed by (Schömann, Rogowski, & Kruppe, 2013), looking from the neo-classical labour market theory's point of view, fixed-term workers should receive higher wages to compensate for the job insecurity associated with fixed-term employment. Most

---

3

empirical studies evidence a wage premium for permanent jobs (Jimeno & Toharia, 1993) (Davia & Hernanz, 2004), usually higher for men than women (Booth, Francesconi, & Frank, 2002)(Stancanelli, 2002), (Hagen, 2002) and for older workers (Kahn, 2013). There are fewer studies looking at the entire wage distribution, but Mertens, Gash, & McGinnity (2007) comparing Germany and Spain find that permanent job's premia are lower at the top. Virtually no studies combine investigating the cohort and distributional dimensions simultaneously, in particular in an international perspective.

### 3. Data & methods

We use data from the European Structure of Earnings Survey (ESES)<sup>4</sup>, an employer-based survey, which provides comparable linked employer-employee information from EU countries. The Survey is supervised by the Eurostat. It covers enterprises with at least 10 employees in the areas of economic activity defined by sections C-K of NACE Rev.1.2. The anonymised and partially aggregated ESES datasets include information on remuneration, individual characteristics of employees (sex, age, occupation, length of service, highest educational level attained, type of contract, etc.) and of their employer (economic activity, size, existence of collective pay agreements, etc.). The biggest advantage of the ESES dataset lies in the information on wages, comparable across countries and the rich data on the demand side (firm level) characteristics of jobs held. Other potential data sources for studying gender pay gaps in a comparable perspective - mainly the EU-SILC - offer much smaller sample sizes and much more limited set of firm-level characteristics. However, the set of individual level data is of course limited (e.g. we have no information on the household characteristics).

We use data from the 2006 wave for sixteen countries: Czech Republic (CZ), Germany (DE), Spain (ES), Finland (FI), France (FR), Hungary (HU), Italy (IT), Lithuania (LT), Latvia (LV), Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), United Kingdom (UK). The sample was restricted to individuals aged 20 and above. Table 1 presents the total number of observations by countries.

We investigate gender pay gaps in four age groups: 20-29, 30-39, 40-49, 50-59<sup>5</sup>. There are differences in the age structure among countries, and in the share of females employed in those age groups. Italy, France and Germany have small shares of young people in total employment, whereas in Finland, Norway and many of the CEE countries those aged 50-59 constitute an above-average shares of all employees. As far as women are concerned, they account for 30% to 50% of all workers. In Spain, Italy, Netherlands, Romania and Portugal the percentage of females in total employment decreases with age. Surprisingly, it increases in Latvia.

<sup>4</sup> The microdata from representative individual surveys used in the study were provided by European Commission, Eurostat. Eurostat has no responsibility for any results and conclusions of the report.

<sup>5</sup> We drop the oldest age group from our analysis as women working in this age are likely to be retired already and thus the results will be biased due to the selection effect and differences in the retirement age among countries. Sample sizes in some of the analysis do not appear to pose problems. The estimates for those aged 60+ are available from authors upon request.

**Table 1. Sample structure by age and gender**

Country	Total sample	Sample by age group				Percent of females by age group			
		20-29	30-39	40-49	50-59	20-29	30-39	40-49	50-59
CZ	1 892 029	23%	28%	25%	24%	37%	37%	41%	39%
DE	3 032 075	19%	26%	34%	21%	39%	35%	36%	37%
ES	228 214	25%	35%	25%	14%	41%	37%	33%	27%
FI	295 836	20%	26%	28%	26%	40%	36%	39%	40%
FR	112 505	18%	29%	31%	21%	38%	37%	35%	33%
HU	758 408	22%	30%	25%	24%	41%	38%	42%	43%
IT	153 476	16%	34%	31%	18%	41%	37%	34%	28%
LT	124 641	23%	26%	31%	19%	40%	43%	44%	42%
LV	275 868	24%	25%	27%	23%	43%	45%	48%	48%
NL	150 068	27%	30%	26%	18%	40%	37%	34%	30%
NO	920 299	22%	29%	28%	22%	33%	30%	31%	29%
PL	639 634	24%	29%	28%	19%	39%	38%	41%	34%
PT	101 504	25%	34%	26%	14%	44%	43%	38%	29%
RO	250 619	21%	34%	27%	17%	44%	43%	43%	31%
SK	660 920	21%	27%	29%	23%	41%	42%	46%	37%
UK	125 342	26%	28%	28%	19%	42%	35%	34%	34%

There is a significant heterogeneity in the prevalence of fixed time contracts and part-time jobs among women in most European countries, in particular once the age perspective is taken into account. With respect to the hours of work, the Netherlands stand out with the highest overall shares of part time work, while it is virtually non existing in Romania. In almost all countries the oldest female workers have the highest proportion of part-time employment. Finland and Norway are exceptions, as the incidence of part time work among youth is similar as among the oldest ones – about 30%.

Spain and Poland traditionally have the highest incidence of temporary work, and this relationship holds strong also for women and in all age groups. Otherwise, young workers are more likely to be employed on temporary contracts in all countries except for Greece. Fixed-term contracts are also common among older workers – especially in Cyprus, Greece, Italy, Lithuania, Romania and Spain. Table 2 presents the structure of women by working time and type of contract.

**Table 2. Structure of women's employment by age, working time and type of contract.**

Country	Year	percent of part-time workers by age group				percent of temporary contract by age group			
		20-29	30-39	40-49	50-59	20-29	30-39	40-49	50-59
CZ	2006	3%	4%	3%	4%	23%	19%	14%	14%
DE	2006	22%	39%	42%	44%	14%	5%	4%	2%
ES	2006	17%	17%	23%	25%	37%	21%	21%	16%

FI	2006	27%	7%	5%	6%	20%	8%	6%	5%
FR	2006	14%	11%	14%	16%	10%	3%	1%	2%
GR	2006	16%	11%	10%	11%	14%	15%	22%	27%
HU	2006	8%	8%	8%	10%	10%	6%	6%	5%
IT	2006	15%	23%	26%	22%	10%	5%	4%	4%
LT	2006	11%	9%	10%	11%	3%	3%	3%	3%
LV	2006	10%	9%	9%	9%	4%	3%	3%	3%
NL	2006	46%	53%	59%	64%	44%	21%	20%	14%
NO	2006	42%	21%	20%	24%	9%	3%	3%	3%
PL	2006	12%	7%	6%	10%	58%	34%	25%	21%
PT	2006	6%	3%	4%	6%	39%	20%	18%	17%
RO	2006	2%	1%	1%	3%	2%	1%	1%	1%
SK	2006	2%	3%	3%	6%	19%	12%	9%	9%
UK	2006	26%	30%	33%	36%	8%	4%	3%	3%

We estimate the gender pay gap using a quantile regression, as in recent studies by Christofides et al., (2013), Arulampalam et al. (2007), Böheim, Himpele, Mahringer, & Zulehner (2010). This methods allows a much more in-depth analysis of wage relationships, as these tend to be different among low and high-paid earners.

The usual approach to estimate gender pay gap is based on least square method. The disadvantage of this method was highlighted by Mosteller and Tukey, who stressed that "just as the mean gives an incomplete picture for single distribution, so the regression curve gives a corresponding incomplete picture of a single distribution" (Mosteller & Tukey, 1977, p. 266). The advantage of quantile regression is that it takes into account the position of individuals in the wage distribution (Machado & Mata, 2001). Moreover the median regression is more robust to outliers than the least squares method (Cameron & Trivedi, 2005, p. 85).

Following Koenker and Bassett (1982), Koenker and Hallock (2001) and Cameron and Trivedi (Cameron & Trivedi, 2005) the quantile regression model (QR) can be described as follows. In conditional quantile functions—models quantiles of the conditional distribution of the response variable ( $y$ ) for individual  $i$  are expressed as functions of observed covariates ( $x$ ):  $Q_q(y_i|x_i) = x_i'\beta_q$ . Under the assumption that  $y$  is linear in  $x$ , vector of QR coefficients ( $\beta_q$ ) can be obtained from minimizing the following objective functions over  $\beta_q$ :

$$Q_N(\beta_q) = \sum_{i:y_i \geq x_i'\beta_q} q|y_i - x_i'\beta_q| + \sum_{i:y_i < x_i'\beta_q} (1 - q)|y_i - x_i'\beta_q|.$$

$Q$ th quantile regression estimator  $\widehat{\beta}_q$  is computed using linear programming.  $\widehat{\beta}_{q,j}$  is interpreted as the marginal change in the conditional  $q$ th quantile due to a marginal change in the  $j$  element of the vector of observed covariates.

The major methodological problem with estimating wage equations, which is discussed in the literature, is the possible selection bias (Beblo, Beninger, Heinze, & Laisney, 2003). In this context self-selection problem may occur. Self-selection takes places if the employed individuals do not form a random subgroup of the sampled population but differ systematically from those not working. No account of this issue can lead to the inconsistent parameters (Cameron & Trivedi, 2005, p. 546). Standard procedure to manage with this problem is two-step estimation proposed by Heckman (Heckman, 1979). In the first step a participation equation is estimated. In the second

step an outcome equation is estimated, but with the inverse Mills ratio obtained from the first step as correction for bias. Beblo et al. (2003) listed studies on the gender wage gap that correct for sample selection. Among seventeen papers recorded by them in seven selection coefficient was not statistically significant. De la Rica & Dolado (2008) analyzed gender pay gap by education group in Spain and they stated that results with and without sample selection remain qualitatively the same. Moreover they highlighted, that correction for selection bias is necessary only when we want to make inference about whole population of females, but not when we wish to analyze only existing gender pay gap among those employed. In our paper we focus only on working population, which needs to be taken into account in interpretation of our results<sup>6</sup>.

We run two sets of estimates of the logarithm of average gross hourly earnings based on: (1) the total sample and (2) a sample restricted to females. In the first set (1) the covariates include gender, educational attainment, occupation, length of service, type of contract, a part-time work dummy, the NACE sector and the firm's size. In the second set (2) gender was excluded from the explanatory variables. Part-time work was defined as working time lower than 75% of the full-time. The regressions were estimated separately for each of the four age groups (20-29, 30-39, 40-49, 50-59) for the 10th, 20th, 25th, 50th, 75th, 80th and 90th percentiles in each age group.

## 4. Results

The analysis of gender pay differentials presents several challenges. Looking at the mean earnings offers a blurred picture, hiding also a large age heterogeneity. We aim at combining these two perspectives and capturing the various wage gap outcomes of women depending on their age, wage level and country. The first part of our analysis (section 4.1) looks at the pay gap between men and women (i.e. the wage coefficients related to gender variable in the OLS regressions), whereas the following analysis on wage premia associated with full time and permanent contracts focus on women only (i.e. compare the situation of women working part time/ temporarily with women working full time/ on a permanent basis). This approach allows us to separate the effect of flexible job contracts from the overall gender pay gap.

### 4.1 Gender pay gap from a cohort perspective

In order to describe the picture of gender wage differentials and their age patterns one needs to precisely choose the "reference level", which itself is not an easy task. We drop the idea of looking at the average wage gap, as it is likely to be biased by the various employment composition of workers in different age groups (and countries) and instead look at the median wages. Furthermore, we start with choosing the 30-39 years old as our age reference group, as the prime age workers have the highest activity rates and their labour market participation is influenced by the institutional factors to a much lesser extent. Detailed results of our estimates are presented in Table A.1 in the Annex.

---

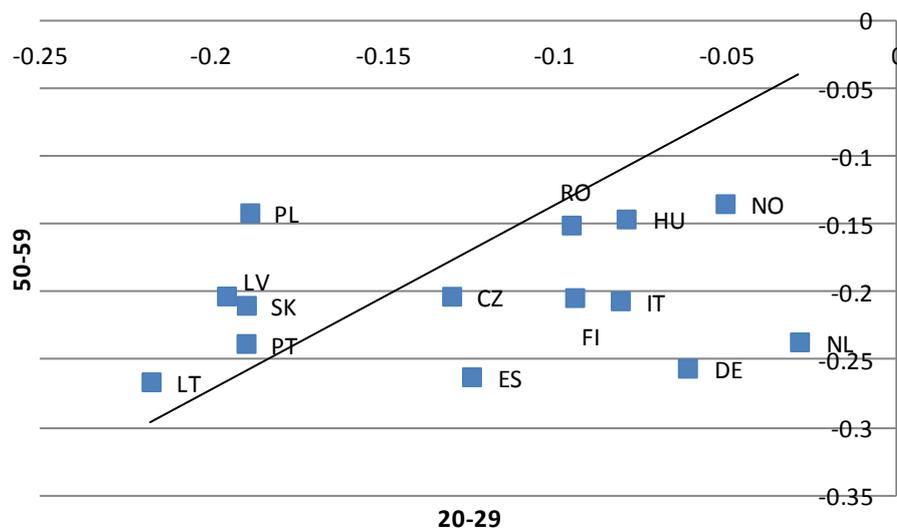
<sup>6</sup> Comparison of result with and without selection is not possible due to the character of the of the data we use. In ESESE only information on workers is gathered.

The picture that emerges shows a significant heterogeneity in the size of the gender pay gaps. Prime age, median wage women are earning less than men (other things equal) in each of the analysed EU countries, however, this difference is relatively low in the Netherlands and Norway (where it does not exceed 10 percent). At the other end of the spectrum, in countries such as Czech Republic, Poland, Portugal and Slovakia female prime age workers earn - *ceteris paribus* - more than 25 % less than their male colleagues. Taking the age perspective into account, relatively few countries - the UK, the Netherlands and Germany - display large differences in the size of the gender pay gap across cohorts. Dutch young women earn 3% less than "comparable" men, whereas this gap increases to 23% among men and women aged 50-59. On the contrary, there is very little variation in the age - specific gender pay gaps in Lithuania and Latvia, where, however, this reflects relatively high pay gaps also for the young workers (and not lower for the prime-age ones).

Looking at a broader picture, European countries exhibit a variety of patterns in the age-specific gender pay gaps. In half of the analyzed EU countries the gender pay gap increases with age. In the second common pattern, the gender pay gap peaks for workers aged 40-49, and decreases afterwards. In Poland and Latvia the pay differentials are largest for men and women in the prime-age.

There are various reasons behind the country differences in the gender pay gap age patterns, though institutional setting appears to be the most important factor. The case of Poland, where the gap for the 50-59 stand out as very low compared to other age groups, could be an example. Throughout the 1990s and 2000s the labour market policy offered several pathways of early withdrawal from the labour market, which was beneficial mainly for the low earners, offering them the highest replacement rates. As a result, the 50+-year old women and men aged 55+ who remained in employment were much more likely to be earning higher wages, hence the lower observed pay gap.

**Figure 1. The gender pay gap (wage coefficients related to women) for the young and the older workers in European countries.**

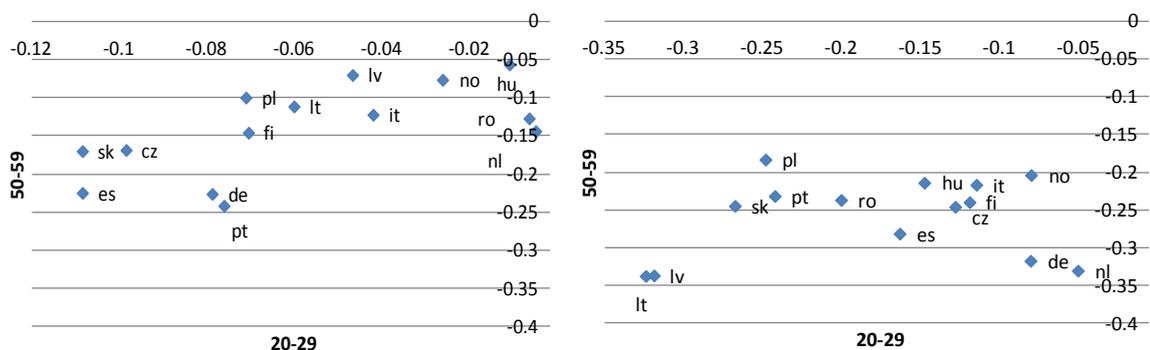


Source: own elaboration based on ESES.

We are particularly interested in the size of the gender pay gap for the young and the older workers, as they are the most important from the perspective of the EU labour market challenges (Lewandowski et al., 2013). Figure 1 presents the distribution of EU countries depending on the size of the gender pay gap in the 20-29 and 50-59 age group. Three observations stand out. Firstly, there is a small group of countries who exhibit very low pay gaps in the youngest cohort and considerable ones for the older workers. These are the Netherlands and Germany, mentioned previously in the context of large variation in the age-specific pay gaps. Secondly, in the rest of the European states, there is no pattern regarding the young and older pay gap link, although clearly countries differ much more when it comes to the size of the pay gap among the older workers. Thirdly, Eastern European countries stand out as those where the relative pay gap among youth (with median earnings) is high, but close to or above the levels among the older workers. The question to what extent these international differences reflect various institutional settings, larger heterogeneity in factors we are not controlling for (such as e.g. educational mismatch in jobs held, "motherhood penalties") or simply some forms of discrimination, remains open.

A slightly different picture emerges once we diverge from the median earnings and take a look at other parts of the earnings distribution, in particular its lower and upper end, that is the 10<sup>th</sup> and 90<sup>th</sup> percentiles. Firstly, the wage coefficients of women remain negative at all levels of earnings we estimated and for all age groups. Secondly, the gender pay gaps are much lower at the bottom of the earnings distribution than at its top, again regardless of workers' age. Here, low paid workers in Germany (aged 20-49) and low paid youth in France are notable exceptions, with higher pay differentials between men and women compared to workers with median pay. Hungary also stands out with very low pay gaps - wages of low paid men and women are almost the same in all age groups. Pay gaps among men and women with high earnings are larger than among those with median wages in all countries, although again, there is a large heterogeneity. The high pay - median pay differences are relatively low in the Czech Republic, and high in the Netherlands.

**Figure 2. The pay gap (wage coefficients associated with women) for the young and the older workers in European countries, for the 10th percentile (left panel) and 90th percentile (right panel).**



Source: own elaboration based on ESES.

We now focus again on the age dimension of the gender pay gap. Figure 2 presents its magnitude at the bottom and at the top of the earnings distribution for the young and

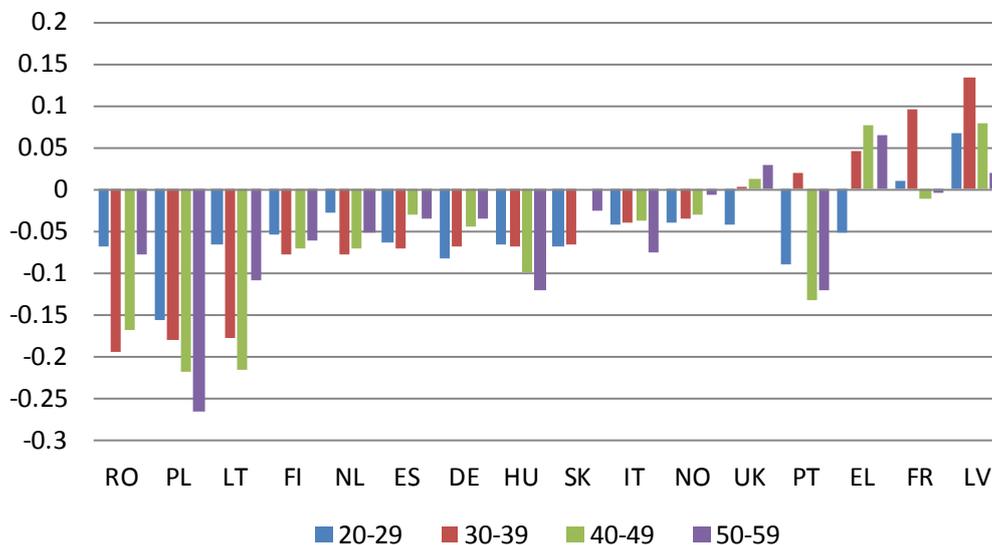
older workers. Wage differentials between men and women earning low wages are much lower among young people than those aged 50-59. However, this is not the case among workers with top wages: young women with high earnings in many of the European countries are similarly disadvantaged compared to men's earnings as their older colleagues. Interestingly, this is more likely to be the case in Central and Eastern European countries, where young women's wage penalties are considerably higher and they are more likely to face a glass ceiling.

## 4.2 Temporary employment and wages

In the next part of our analysis we look at the wage premia/penalties attached to fixed term contracts. Again, we are interested in their size and distribution among women of different age, in different countries and at different points of the wage distribution. Detailed results are presented in Table A3 in the Annex.

We start with looking at the distribution of the wage premium attached to temporary contracts among median earners in four age cohorts. A picture of heterogeneity emerges. While in most countries fixed term contracts are associated with lower wage returns for women, this is not the case in Latvia, France or Greece, where women working temporarily are paid more, all other things equal. Also in Portugal and the UK women in some of the age groups (earning median wages) are paid more if employed on a temporary basis.

Figure 3. Fixed term contracts (median) wage premium/penalty by age in European countries



Note: countries sorted ascending by 30-39 age group.

Source: own elaboration based on ESES.

The hypothesis of a permanent job premium decreasing with age, as put forward by (Blanchard & Landier, 2002), is confirmed for only a few countries in our sample, notably Germany, Norway, Slovakia and the United Kingdom. The case of Poland and Hungary stand in contrast to this, with a clear rise in temporary contracts penalties

along with age. Other countries stand in between, though in great majority of them the fixed term contract gap is higher among prime-age women.

Central and Eastern European countries distinguish themselves also by considerably higher - on average- permanent job premia. These exceed 15% in case of prime age women. Moreover, interesting results emerge when we look at the permanent/temporary wage premium among younger women. These tend to be higher (relative to older cohorts) in Western European countries (as noted also by (L. M. Kahn, 2013)). At the same time in most of the analysed New Member States - Hungary, Poland, Lithuania and Romania wage penalties attached to temporary contracts are smaller among young women compared to the prime-age and older ones<sup>7</sup>.

The picture of temporary/permanent job wage premia becomes more complex once we look at different points of the wage distribution. The wage associated with permanent contracts tend to be much higher among the top female earners, which stands in contrast to previous studies in the literature (Mertens et al., 2007). Interestingly, this is also the case for temporary contracts in those countries where these offer a higher pay (as in Latvia, France and Greece).

The wage penalties of young women with temporary contracts become particularly high at the bottom of the wage distribution in Germany. In several countries the observed patterns change considerably for women in older cohort (aged 50-59). Firstly, in Portugal high paid women with temporary contracts become less (and little only) disadvantaged compared to the median and low paid ones. In France women aged 50-59 from the lower half of the earnings distribution appear to be the only groups heavily penalized for temporary contracts. In the UK, while the penalization of older women with low paid fixed term contracts remains similar to the case of their younger colleagues, a considerable wage premium emerges for the better paid ones (much larger than in the younger cohorts).

### 4.3 Part time work returns - a premium or penalty?

The final aspect of female working arrangements we want to look at are part time jobs and the economic returns they offer, measured by the wage gap among women working part time (i.e. those with less than 0.75 of a full time working hours level) compared to those with full time contracts. Again, we investigate the age dimension of female part time pay premia and penalties. Our analysis is based on the comparison of part time wage coefficients from the quantile regressions run for female workers in the EU countries in different age groups and at different points of the earnings distribution, as discussed in the methodological section.

---

<sup>7</sup> Another interesting observation relates to wages of temporary female workers aged 60+. In some of the EU countries (Germany, Italy, the Netherlands, Portugal) these become positive, even though fixed term contracts are associated with wage penalties for all other age groups in these countries. These results require further exploration, though we believe the selection effects are the reason behind these patterns. The results are available from authors upon request.

We start with looking at the size of the part time wage coefficients among women earning median wages, for the four age groups (20-29, 30-39, 40-49, 50-59). Firstly, Table 3 summarizes the distribution of EU countries depending on whether the part time workers enjoy a wage premium or a penalty - and how these vary across the age groups.

**Table 3. Distribution of EU countries depending on part time jobs wage premium/penalty at median wage.**

Wage premium/penalty by age	Countries
Wage premium in all age groups	Hungary
Wage premium/penalty in some wage groups	Portugal, Greece, Spain, Finland, Latvia, Romania
Wage penalty across all age groups	Germany, Italy, Lithuania, France, Netherlands, Norway, Poland, Slovakia, United Kingdom
<i>Source: own elaboration based on ESES.</i>	

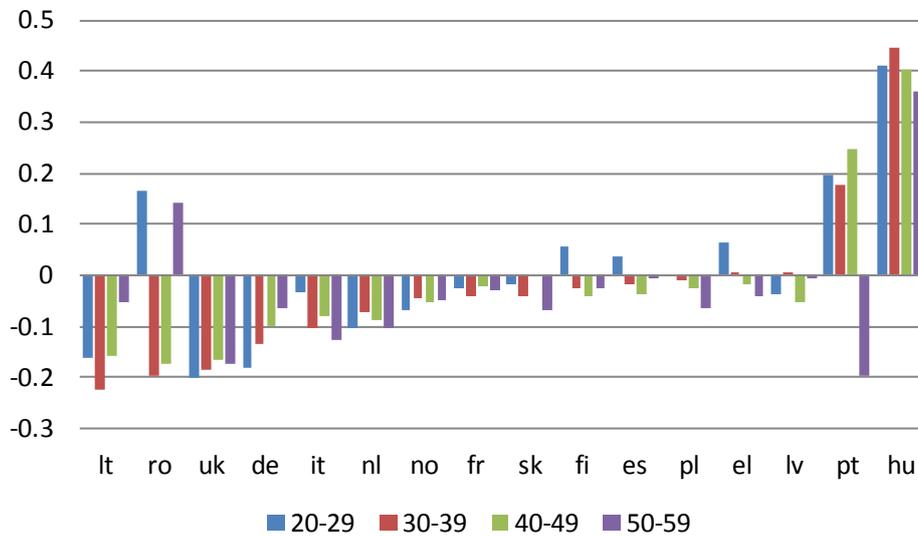
Three basic patterns can be observed. Firstly, in most EU countries part time female workers with median earnings are penalized in terms of wages they receive. Secondly, in some of the EU member states, part time wage coefficients switch from positive to negative depending on the age group. Thirdly, Hungary stands out as an interesting case, where female part time workers enjoy large wage premia, in each cohort.

Within these broadly defined groups various age patterns of the part time pay gap emerge. In the set of countries in which female workers are penalized for part time work regardless of age, UK, Germany and Lithuania stand out as countries where this gap is relatively high. Furthermore, looking from the age perspective, in the UK and Germany the gap is the highest among young women and goes down with age, while in Poland the gap increases with age, up till retirement (cf. Figure 4).

Also the countries with a "mixed model" of age specific part time wage gaps differ considerably. In Greece, Spain and Finland young women enjoy a part time wage premium, which turns negative in the course of their lives and working careers. In Romania a considerable positive wage premium among young and the older part-timers becomes an also large wage penalty for those aged 30-49.

It is equally interesting to look at the wage premium of part time workers aged 50-59, who are close to retirement (or are likely to be entitled to early retirement pensions already), thus their labour supply decisions are likely to be different from their younger colleagues and one might expect less cross country variation in the size and patterns of the part time wage premium. Yet, this is not the case. The part time wage coefficients among oldest women vary from a high of 0.36 in Hungary to a low of -0.19 in Portugal. While in several countries they differ little from the wage gap for those aged 40-49, in Portugal and Romania there is a very strong reversal of the pattern, with a part time wage advantage appearing in Romania - and disappearing in Portugal.

Figure 4. Part time jobs wage premium/penalty by age in European countries



Note: countries sorted ascending by 30-39 age group.

Source: own elaboration based on ESES.

We now turn to analyzing what happens at the lower and upper end of the wage distribution. We start with looking at women with low earnings (at the 10<sup>th</sup> percentile). Firstly, the part time pay gaps are on average slightly lower among the bottom earners, which is most likely linked to the labour supply decisions and reservation wages shaping the lowest levels of earnings, even among part timers. Romania and Portugal exhibit the largest differences compared to the median-paid women: in Romania the wage penalties associated with part time increase considerably for the prime age women and become negative for the youngest and the oldest age group. In Portugal older part time female workers are better off and the bottom of the wage distribution, in contrast to those aged 40-49. Interestingly, Hungary keeps its high part time wage premia for women of all ages, the premia become also positive in Spain (though marginal in size).

The picture changes once we look at the top earners, at the 90<sup>th</sup> percentile, where several positive part time wage premia appear. In other words, high-earning women working part time are much more likely to enjoy higher hourly wages (*ceteris paribus*), compared to lower paid colleagues. The UK and the Netherlands remain the only countries, where the wage coefficients are negative for all age groups at all points of the wage distribution. The wage penalties remain in place also for most women in Italy, while Latvian, Lithuania, Polish, Hungarian and Portuguese female part time workers enjoy high wage premia, regardless of age.

We end our analysis with summing up the distribution of the part time wage gap among female workers of different age and with different levels of earnings. Firstly, the pay gaps tend to be much smaller among low paid women and increases in size alongside the earnings distribution. Secondly, while among the low and median wage earners there are more countries in which women are penalized for part time work, regardless of age, this changes for the better paid female workers. Wage coefficients go

up and in case of several age groups become positive. Thirdly, older women working part time in most countries tend to be more penalized in terms of wages than younger cohorts, although Lithuania, Romania and Germany are notable exceptions to this.

## 5. Conclusions

This paper aimed at looking at female wage returns to the labour market, adding value to the existing literature by investigating the flexibility and cohort dimensions in a comparative, cross country perspective. We found a number of interesting results.

Our analysis confirmed a large heterogeneity of gender wage gaps among countries, even if we control for the same, wide set of individual and firm level characteristics. The premium earned by men is rather low in the Netherlands and Norway, whereas it is more than three times higher in Czech Republic, Poland, Portugal and Slovakia, where female prime age workers earn - *ceteris paribus* - approximately 25-30 % less than their male colleagues.

Secondly, there is a considerable heterogeneity with respect to the cohort dimension of gender pay gaps, both within and among countries. A few countries experience large variation in the size of the gaps among women of different age, which stems mainly from lower pay gaps for young women. These results suggest that the evidence from the literature on the low pay gaps among labour market entrants, available mostly for the UK (Chevalier, 2004; Manning & Swaffield, 2008) does not hold for all European countries. Particularly in some of the CEE countries women are penalized in terms of wages already early in their careers. At the same time there is a pattern of increasing gender pay differentials along with age, which in some of the analyzed countries slows down and/or reverses at the age when female labour market participation declines. Thus, we believe institutional setting to be the main driver of the cross country differences. Interestingly, the large pay gaps among young women in some of the New Member States are much lower for the low paid workers and considerably higher for the top earners, which might suggest that the better educated women in some of the Eastern European countries experience larger difficulties with school-to-work transitions and are much more likely to face glass ceilings. The question, to what extent these differences in pay gaps for the youngest cohort are related to the mean age of women at the birth of the first child (which is considerably lower in EEC - and the highest in the UK among OECD countries) remains open.

We also investigated the wage returns associated with two types of atypical, flexible job contracts - temporary and part time ones. Once the international and cohort perspectives are taken into account, again a picture of large heterogeneity emerges, though both types of jobs appear to be a rather mixed blessing for women. Fixed term contracts penalize women in terms of wages in a great majority of countries, though exceptions arise: temporary workers in Greece, Latvia and France are more likely to be paid better than full time ones. Again, once the age perspective is accounted for, some of the EEC countries stand out. In particular, in Poland and Hungary there is a clear rise in temporary contracts penalties along with age (and at virtually all points of the wage distribution), contrary to the patterns observed in Western European countries and in other studies (Blanchard and Landier 2002). Moreover, we identified several

cases for in -depth investigation and linking to the potential institutional explanatory factors, such as low paid older women in France and young in Germany, who experience a sizeable wage gap with respect to temporary contracts. UK with a high wage premium for older well paid women with fixed-term contract is another field for exploration.

Part time work tends to be associated, on average, with a wage penalty for women. However, also here the size of the negative coefficients varies considerably, both among countries and age groups. No single cohort pattern emerges and Portugal and Hungary stand out with positive part time wage coefficients in almost all age groups. Interestingly, the picture is very different if we look at the ends of the wage distribution. Part time wage penalties are much lower at the bottom of the earnings ladder and mostly positive for the top earners, suggesting that women with higher wages are more likely to receive higher hourly earnings than women working full time, all other things equal. In most countries part time work is beneficial mostly for the better educated women with higher job incomes, though this does not apply to older ones.

The results of our study show the complexity of problems policymakers face when addressing challenges relating to female labour market opportunities. Firstly, it is evident that women at different ages experience very different problems and labour market outcomes, even within the same countries, and these call for a set of age-specific, targeted policies. Secondly, these require more in depth studies on the drivers of those various age-specific gaps - both as regards the gender pay differentials, as well as part time and temporary pay. Institutional settings are likely to be the most important driver of these differences: what matters are country-specific labour market regulations and laws, including also those relating to equal rights for part-time/temporary workers, strict rules against the labour market discrimination, family policies enabling women to combine work and family life (Hardoy & Schøne, 2006), collective bargaining setting (Moriconi, Marsden, & Magda, 2012) or tax-benefits policies. Yet, the detailed reasons for those variations still need to be researched in depth. We need to understand to what extent women are penalized for taking up part time work, and to what extent the negative pay gaps are compensated for with non-monetary benefits and solutions or policies. How do these wage gaps differ for women who work part time voluntarily and because of no other option? The same applies to fixed term contracts - do they compensate for lower earnings with flexibility, or does the lower pay reflect lower productivity, a worse job market? Another open research question pertains to the explanations of country differences in this respect, in particular the stories behind those few countries, where both temporary jobs and part time contracts pay better. To what extent the differences between Eastern and Western European countries (in particular in their part time wage gaps) are driven by the small share of women employed on a part time basis? The fact that fixed term contracts are a wide name for contracts with very different degrees of employment protection makes the analysis and comparisons even more difficult.

## 6. References

- Albrecht, J., Bjorklund, A., & Vroman, S. (2003). Is There a Glass Ceiling in Sweden? *Journal of Labor Economics*, 21(1), 145–177.
- Albrecht, J., van Vuuren, A., & Vroman, S. (2009). Counterfactual distributions with sample selection adjustments: Econometric theory and an application to the Netherlands. *Labour Economics*, 16(4), 383–396.
- Antonczyk, D., Fitzenberger, B., & Sommerfeld, K. (2010). Rising wage inequality, the decline of collective bargaining, and the gender wage gap. *Labour Economics*, 17(5), 835–847. doi:10.1016/j.labeco.2010.04.008
- Arulampalam, W., Booth, A. L., & Bryan, M. L. (2007). Is There a Glass Ceiling over Europe? Exploring the Gender Pay Gap across the Wage Distribution. *Industrial and Labor Relations Review*, 60(2), 163–186.
- Autor, D., Levy, F., & Murnane, R. (2003). The skill content of recent technological change: An empirical exploration. *The Quarterly Journal of Economics*, 118(June).
- Barnard, A. (2008). Modelling the gender pay gap in the UK: 1998 to 2006. *Economic and Labour Market Review*. Retrieved from <http://ons.gov.uk/ons/rel/elmr/economic-and-labour-market-review/no--8--august-2008/economic---labour-market-review.pdf#page=18>
- Barrett, G., & Doiron, D. (2001). Working part time: by choice or by constraint. *Canadian Journal of Economics*, 34(4), 1042–1065. Retrieved from <http://www.jstor.org/stable/10.2307/3131937>
- Blanchard, O., & Landier, A. (2002). The perverse effects of partial labour market reform: fixed-term contracts in France. *The Economic Journal*, 112(480), F214–F244.
- Blau, F. D., & Kahn, L. M. (1999). Analyzing the gender pay gap. *The Quarterly Review of Economics and Finance*, 39(5), 625–646. doi:10.1016/S1062-9769(99)00021-6
- Böheim, R., Himpele, K., Mahringer, H., & Zulehner, C. (2010). Determinants of wage differences between men and women in Austria.
- Booth, A. L. (2009). Gender and competition. *Labour Economics*, 16(6), 599–606. doi:10.1016/j.labeco.2009.08.002
- Booth, A. L., Francesconi, M., & Frank, J. (2002). Temporary jobs: stepping stones or dead ends? *The Economic Journal*, 112(480), F189–F213.

- Booth, A., & Wood, M. (2008). Back-to-Front Down Under? Part-Time/Full-Time Wage Differentials in Australia. *Industrial Relations: A Journal of Economy ...*. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-232X.2008.00507.x/full>
- Bosch, N., Deelen, A., & Euwals, R. (2010). Is Part-time Employment Here to Stay? Working Hours of Dutch Women over Successive Generations. *Labour*, 24(1), 35–54. doi:10.1111/j.1467-9914.2010.00470.x
- Cai, L., & Liu, A. Y. C. (2011). Public-Private Sector Wage Gap in Australia: Variation along the Distribution. *British Journal of Industrial Relations*, 49(2), 362–390. doi:10.1111/j.1467-8543.2009.00773.x
- Cameron, C. A., & Trivedi, P. K. (2005). *Microeconometrics. Methods and applications*. New York: Cambridge University Press.
- Card, D., & DiNardo, J. (2002). Skill biased technological change and rising wage inequality: some problems and puzzles. *Journal of Labor Economics*, 20(4), 733–783.
- Chevalier, A. (2004). Motivation , Expectations and the Gender Pay Gap for UK Graduates, (1101).
- Cho, D., Cho, J., & Song, B. (2010). An empirical analysis of the gender earnings gap between the public and private sectors in Korea: A comparative study with the US. *Journal of the Japanese and International Economies*, 24(3), 441–456. doi:10.1016/j.jjie.2010.02.001
- Christofides, L. N., Polycarpou, A., & Vrachimis, K. (2013). Gender wage gaps, “sticky floors” and “glass ceilings” in Europe. *Labour Economics*, 21(March 2009), 86–102. doi:10.1016/j.labeco.2013.01.003
- Chzhen, Y., & Mumford, K. (2011). Gender gaps across the earnings distribution for full-time employees in Britain: Allowing for sample selection. *Labour Economics*, 18(6), 837–844. doi:10.1016/j.labeco.2011.05.004
- Davia, M. A., & Hernanz, V. (2004). Temporary employment and segmentation in the Spanish labour market: An empirical analysis through the study of wage differentials. *Spanish Economic Review*, 6(4), 291–318.
- Felgueroso, F., Perez-Villadóniga, M. J., & Prieto-Rodriguez, J. (2008). The Effect Of The Collective Bargaining Level On The Gender Wage Gap: Evidence From Spain. *Manchester School, University of Manchester*, 76(3), 301–319.
- Gregory, M., & Connolly, S. (2008). Feature: The Price of Reconciliation: Part-Time Work, Families and Women’s Satisfaction\*. *The Economic Journal*, 118(2005). Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0297.2007.02113.x/full>

- Hagen, T. (2002). Do temporary workers receive risk-premiums? Assessing the wage effects of fixed-term contracts in West-Germany by matching estimators compared with parametric approaches. *Labour*, 16(4), 667–705.
- Hardoy, I., & Schøne, P. (2006). The Part-Time Wage Gap in Norway: How Large is It Really? *British Journal of Industrial Relations*, (June), 263–282. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8543.2006.00497.x/abstract>
- Hewitt, B., Western, M., & Baxter, J. (2002). Marriage and Money: The Impact of Marriage on Men's and Women's Earnings. *Negotiating the Life Course*.
- Hirsch, B. (2005). Why do part-time workers earn less? The role of worker and job skills. *Industrial and Labor Relations Review*, 58(4), 525–551. Retrieved from <http://www.jstor.org/stable/10.2307/30038605>
- Hoobler, J. M., Wayne, S. J., & Lemmon, G. (2009). Bosses' perceptions of family-work conflict and women's promotability: Glass ceiling effects. *Academy of Management Journal*, 52(5), 939–957.
- Jimeno, J. F., & Toharia, L. (1993). The effects of fixed-term employment on wages: Theory and evidence from Spain. *Investigaciones Economicas*, XVII(3), 475–494.
- Kahn, L. (2012). Labor market policy: A comparative view on the costs and benefits of labor market flexibility. *Journal of Policy Analysis and Management*, 31(1), 94–110.
- Kahn, L. M. (2013). The Structure of the Permanent Job Wage Premium : Evidence from Europe The Structure of the Permanent Job Wage Premium : Evidence from Europe, (7623).
- Koenker, R., & Bassett, G. (1982). Robust tests for heteroscedasticity based on regression quantiles. *Econometrica*, 50, 43–61.
- Koenker, R., & Hallock, K. (2001). Quantile regression. *Journal of Economic Perspectives*, 15, 143–156.
- Lewandowski, P., Magda, I., & Baran, J. (2013). Gender dimension of the labour markets over the past two decades .
- Manning, A., & Petrongolo, B. (2008). The Part-Time Pay Penalty for Women in Britain\*. *The Economic Journal*, (2419). Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0297.2007.02115.x/full>
- Manning, A., & Swaffield, J. (2008). The gender gap in early-career wage growth. *The Economic Journal*, 118 (July), 983–1024. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0297.2008.02158.x/full>
- Manning, A., & Swaffield, J. (2008). The Gender Gap in the Early Career Wage Growth. *The Economic Journal*, 118(530), 983–1024.

- Meng, X., & Meurs, D. (2004). The gender earnings gap: effects of institutions and firms--a comparative study of French and Australian private firms. *Oxford Economic Papers*, 56(2), 189–208.
- Mertens, A., Gash, V., & McGinnity, F. (2007). The Cost of Flexibility at the Margin. Comparing the Wage Penalty for Fixed-term Contracts in Germany and Spain using Quantile Regression. *Labour*.
- MORICONI, S., Marsden, D., & Magda, I. (2012). Collective Agreements, Wages and Firms' Cohorts: Evidence from Central Europe. *Industrial and Labor ...*, 65(July), 607–629. Retrieved from <http://publicatt.unicatt.it/handle/10807/19243>
- OECD. (2012a). Closing the gender gap. Paris.
- OECD. (2012b). *Education at a Glance 2012: OECD Indicators*. OECD Publishing, Paris.
- Rica, S. D. la, Dolado, J., & Llorens, V. (2008). Ceilings or floors? Gender wage gaps by education in Spain. *Journal of Population Economics*, 2004. Retrieved from <http://link.springer.com/article/10.1007/s00148-006-0128-1>
- Schömann, K., Rogowski, R., & Kruppe, T. (2013). *Labour Market Efficiency in the European Union: Employment protection and fixed-term contracts*. Routledge.
- Stancanelli, E. (2002). Do temporary jobs pay? Wages and career perspectives of temporary workers. *Tilburg University Working Paper*, (September), 1–43.

## ANNEX.

Table A4. Gender pay gap (estimated coefficients associated with women), by percentiles.

country	age	percentiles				
		0.1	0.2	0.5	0.8	0.9
cz	20-29	-0,0984***	-0,1168***	-0,1302***	-0,1297***	-0,1278***
cz	30-39	-0,1952***	-0,2226***	-0,2579***	-0,2796***	-0,285***
cz	40-49	-0,1898***	-0,2172***	-0,2482***	-0,2676***	-0,2771***
cz	50-59	-0,1684***	-0,1881***	-0,2028***	-0,2256***	-0,2457***
de	20-29	-0,0787***	-0,0666***	-0,0614***	-0,0683***	-0,0801***
de	30-39	-0,1621***	-0,1402***	-0,1316***	-0,1495***	-0,1622***
de	30-39	-0,1621***	-0,1402***	-0,1316***	-0,1495***	-0,1622***
de	40-49	-0,2088***	-0,192***	-0,1973***	-0,2172***	-0,2342***
de	50-59	-0,226***	-0,2261***	-0,256***	-0,2997***	-0,3172***
es	20-29	-0,1084***	-0,12***	-0,1244***	-0,1383***	-0,163***
es	30-39	-0,1724***	-0,1662***	-0,1923***	-0,2195***	-0,2414***
es	40-49	-0,1981***	-0,2052***	-0,2198***	-0,2375***	-0,2417***
es	50-59	-0,2246***	-0,2289***	-0,2623***	-0,3029***	-0,2812***
fi	20-29	-0,0704***	-0,0796***	-0,0943***	-0,1082***	-0,1187***
fi	30-39	-0,1487***	-0,1542***	-0,1696***	-0,1866***	-0,1952***
fi	40-49	-0,1549***	-0,1637***	-0,1981***	-0,225***	-0,241***
fi	50-59	-0,1457***	-0,1641***	-0,2038***	-0,231***	-0,2396***
fr	20-29	-0,0645***	-0,0598***	-0,0605***	-0,0501***	-0,0576***
fr	30-39	-0,0863***	-0,0785***	-0,1068***	-0,1153***	-0,1234***
fr	40-49	-0,1124***	-0,1235***	-0,1134***	-0,1595***	-0,2097***
hu	20-29	-0,0107***	-0,0272***	-0,0793***	-0,1266***	-0,1474***
hu	30-39	-0,0028	-0,0618***	-0,1284***	-0,2024***	-0,2357***
hu	40-49	-0,0285***	-0,0706***	-0,1628***	-0,2338***	-0,2674***
hu	50-59	-0,0562***	-0,0907***	-0,1457***	-0,1966***	-0,2138***
it	20-29	-0,0419***	-0,0516***	-0,081***	-0,1379***	-0,1144***
it	30-39	-0,0855***	-0,0942***	-0,1267***	-0,1427***	-0,158***
it	40-49	-0,0959***	-0,1263***	-0,1805***	-0,2106***	-0,2111***
it	50-59	-0,1221***	-0,1484***	-0,2062***	-0,2441***	-0,2165***
lt	20-29	-0,06***	-0,1036***	-0,2179***	-0,3049***	-0,3239***
lt	40-49	-0,0825***	-0,1495***	-0,2497***	-0,3603***	-0,4168***
lt	50-59	-0,1113***	-0,181***	-0,266***	-0,3086***	-0,3373***
lv	20-29	-0,0466***	-0,1063***	-0,1959***	-0,2861***	-0,3187***
lv	30-39	-0,0733***	-0,1163***	-0,239***	-0,3466***	-0,3711***
lv	40-49	-0,0627***	-0,1178***	-0,2231***	-0,3213***	-0,3733***
lv	50-59	-0,07***	-0,1206***	-0,2026***	-0,289***	-0,3366***

nl	20-29	-0,0047**	-0,0113***	-0,0287***	-0,0512***	-0,0501***
nl	30-39	-0,0657***	-0,0672***	-0,096***	-0,1303***	-0,1649***
nl	40-49	-0,1381***	-0,1564***	-0,1889***	-0,2276***	-0,2914***
nl	50-59	-0,1437***	-0,1812***	-0,2365***	-0,3001***	-0,3303***
no	20-29	-0,026***	-0,0375***	-0,0504***	-0,0658***	-0,0797***
no	30-39	-0,0658***	-0,0697***	-0,0917***	-0,1227***	-0,1554***
no	40-49	-0,0758***	-0,0874***	-0,1184***	-0,1648***	-0,186***
no	50-59	-0,0763***	-0,0919***	-0,1344***	-0,1796***	-0,2036***
pl	20-29	-0,071***	-0,1158***	-0,1891***	-0,2331***	-0,248***
pl	30-39	-0,1489***	-0,1951***	-0,2739***	-0,3378***	-0,3681***
pl	40-49	-0,1525***	-0,1941***	-0,2637***	-0,327***	-0,3616***
pl	50-59	-0,0996***	-0,107***	-0,1411***	-0,1756***	-0,1831***
pt	20-29	-0,076***	-0,1037***	-0,1902***	-0,2266***	-0,2421***
pt	30-39	-0,2034***	-0,2347***	-0,2926***	-0,3357***	-0,3467***
pt	40-49	-0,2263***	-0,2518***	-0,3219***	-0,3749***	-0,4374***
pt	50-59	-0,2415***	-0,2624***	-0,2377***	-0,1969***	-0,2314***
ro	20-29	-0,0062***	-0,0041**	-0,0953***	-0,149***	-0,2001***
ro	40-49	-0,0614***	-0,0938***	-0,178***	-0,2533***	-0,2778***
ro	50-59	-0,127***	-0,1362***	-0,1502***	-0,2***	-0,2366***
sk	20-29	-0,1084***	-0,1489***	-0,1901***	-0,2509***	-0,2674***
sk	30-39	-0,2166***	-0,2531***	-0,2939***	-0,3554***	-0,3936***
sk	40-49	-0,2146***	-0,2341***	-0,2772***	-0,3362***	-0,4049***
sk	50-59	-0,1699***	-0,1902***	-0,2095***	-0,2372***	-0,2445***
uk	20-29	-0,018***	-0,0248***	-0,0422***	-0,0701***	-0,083***
uk	30-39	-0,0941***	-0,1057***	-0,1231***	-0,1539***	-0,1807***
uk	40-49	-0,1839***	-0,1986***	-0,2286***	-0,2511***	-0,2889***

Table A 5. Estimated coefficients for part time contracts, quantile regressions, for females

		percentiles						
age		0.1	0.2	0.25	0.5	0.75	0.8	0.9
de	20-29	-0,2236***		-0,1927***	-0,1831***	-0,1351***		
de	30-39		-0,1304***	-0,1288***	-0,1338***			
de	40-49	0.0008			-0,0445***		-0,0805***	
de	50-59		-0,0671***		-0,0648***	-0,049***	-0,0343***	
el	20-29	0,0551***	0,0475***	0,0438***	0,0648***	0,0534***	0,046***	0,1233***
el	30-39	-0,0053	0,0098***	-0,0028	0,0031	-0,0162***	-0,0533***	-0,0926***
el	40-49	0,037***	0,0821***	0,0087**	0,0762***	0,0233***	0,0583***	0,0148**
el	50-59	-0,0555***	-0,0294***	-0,0521***	-0,0415***	-0,0813***	-0,1079***	0,0466***
es	20-29	0,0319***	0,0335***	0,0338***	0,0382***	0,0748***	0,095***	0,2057***
es	30-39	0	-0,0162***	-0,0254***	-0,0167***	0,0125***		0,1032***
es	40-49	-0,0281***		-0,0303***	-0,0292***	0,0022	-0,0489***	
es	50-59	0,0186***	-0,002	-0,0124***	-0,0078***	-0,0121***	0,0132***	0,0709***
fi	20-29	0,0272***	0,0327***	0,0419***	0,0571***	0,0603***	0,0655***	0,0841***
fi	30-39	-0,0411***	-0,0267***	-0,0249***	-0,027***	-0,0295***	-0,0231***	-0,0405***
fi	40-49	-0,0682***		-0,0414***	-0,0703***	-0,0268***	-0,0923***	-0,114***
fi	50-59	-0,0574***	-0,0409***	-0,0342***	-0,0257***	-0,0034		-0,0084
fr	20-29	0,0238***	0,0042***	-0,0044***	-0,0247***	-0,0258***	-0,0199***	-0,0038**
fr	30-39	-0,0066***	-0,038***	-0,0401***	-0,0424***	-0,0233***	-0,0197***	0,0246***
fr	40-49	0,0507***	0,0366***	-0,037***	-0,0119***	0,0088***	0,0355***	0,0679***
fr	50-59	0,0147***	-0,0261***	-0,0212***	-0,03***	-0,0226***	-0,0022	-0,0567***
hu	20-29	0,2923***	0,2987***	0,3259***	0,4121***	0,4076***	0,3958***	0,3735***
hu	30-39	0,3277***	0,3269***	0,3424***	0,4476***	0,436***	0,4309***	0,426***
hu	40-49	-0,0502***	-0,0594***	0,3268***	-0,0991***	0,4119***	-0,1635***	-0,2044***
hu	50-59	0,262***	0,2769***	0,2782***	0,3608***	0,3847***	0,4025***	0,4418***
it	20-29	-0,0816***	-0,0634***	-0,059***	-0,0316***	0,0039*	0,0642***	0,0605***
it	30-39	-0,0787***	-0,0814***	-0,0828***	-0,1016***	-0,1033***	-0,0908***	-0,1169***
it	40-49		-0,0652***	-0,0587***	-0,0375***	-0,1012***	-0,0621***	-0,074***
it	50-59	-0,0827***	-0,081***	-0,0874***	-0,1282***	-0,1394***	-0,174***	-0,1999***
lt	20-29	-0,0785***	-0,1628***	-0,149***	-0,1618***	-0,1021***	-0,0637***	0,0323***
lt	30-39	-0,1076***	-0,1691***	-0,1932***	-0,2237***	-0,1782***	-0,1493***	0,0312**
lt	40-49	-0,1211***	-0,1781***	-0,1586***	-0,2153***	-0,1298***	-0,1111***	-0,148***
lt	50-59	-0,1251***	-0,1178***	-0,1097***	-0,0508***	0,0411***	0,0362***	0,0735***
lv	20-29	-0,1252***	-0,1194***	-0,1001***	-0,0385***	0,0545***	0,0607***	0,1962***
lv	30-39	-0,1032***	-0,0727***	-0,0907***	0,0071	0,1488***	0,1847***	0,2689***
lv	40-49	0	0,0132	-0,0817***	0,0788***	0,0679***	0,1539***	0,2805***
lv	50-59	-0,1075***		-0,0536***	-0,006	0,0596***	0,1071***	0,1981***
nl	20-29	-0,1684***	-0,1607***	-0,1532***	-0,1041***	-0,0828***	-0,0791***	-0,0368***

nl	30-39	-0,0509***	-0,053***	-0,0539***	-0,0704***	-0,0826***	-0,0767***	-0,0639***
nl	40-49	-0,06***	-0,0578***	-0,052***	-0,0708***	-0,0912***	-0,1084***	-0,1296***
nl	50-59	-0,0445***	-0,0539***	-0,0615***	-0,1053***	-0,1077***	-0,1089***	-0,0641***
no	20-29	-0,0488***	-0,0564***		-0,0676***	-0,0665***	-0,0639***	
no	30-39				-0,0448***	-0,0564***		
no	40-49				-0,0304***		-0,047***	-0,0662***
no	50-59			-0,041***	-0,0494***	-0,055***		
pl	20-29	0	0,0054**	0,0068***	0	0,0274***	0,0573***	0,1168***
pl	30-39	0,0056**	0	-0,0049*	-0,0098***	0,019***	0,0515***	0,0907***
pl	40-49	-0,1043***	-0,1191***	-0,0096***	-0,217***	-0,0007	-0,2395***	-0,2473***
pl	50-59	-0,1124***	-0,0786***	-0,059***	-0,0627***	-0,0244***	0,0006	0,0422***
pt	20-29	0,0789***	0,123***	0,1288***	0,1957***	0,237***	0,3351***	0,6618***
pt	30-39	0,0815***	0,1273***	0,1509***	0,1778***	0,1169***	0,3133***	0,3772***
pt	40-49	-0,1044***	-0,1177***	-0,0444***	-0,1335***	0,2976***	-0,201***	-0,2403***
pt	50-59	0,1632***	0,1065***	0,0732***	-0,1956***	-0,0288***	0,054***	0,1901***
ro	20-29	-0,0474***	0	0	0,1652***	0,1597***	0,1907***	0,0426***
ro	30-39	-0,4308***	-0,3643***	-0,3083***	-0,1981***	-0,1392***	-0,1913***	-0,0498***
ro	40-49	-0,2205***	-0,1149***	-0,2372***	-0,1679***	-0,004	-0,2138***	-0,0779***
ro	50-59	-0,2319***	-0,0484***	-0,0228**	0,1416***	0,2607***	0,2568***	0,2285***
uk	20-29	-0,0926***	-0,1147***	-0,1325***	-0,1995***	-0,2222***	-0,2158***	-0,1996***
uk	30-39	-0,1041***	-0,1269***	-0,1458***	-0,185***	-0,1792***	-0,1627***	-0,1448***
uk	40-49	-0,021***	-0,0159***	-0,1002***	0,0127***	-0,1579***	0,0389***	0,0598***
uk	50-59	-0,0502***	-0,0884***	-0,1029***	-0,1718***	-0,1725***	-0,1652***	-0,145***

Table A6. Estimated coefficients for fixed-term contracts, quantile regressions, for females

country	Age group	percentiles						
		0.1	0.2	0.25	0.5	0.75	0.8	0.9
de	20-29	-0,2011***		-0,1031***	-0,083***	-0,0873***		
de	30-39		-0,0612***	-0,064***	-0,0685***			
de	40-49	0.0008			-0,0445***		-0,0805***	
de	50-59		-0,0156***		-0,0358***	-0,0535***	-0,0672***	
el	20-29	-0,0547***	-0,0511***	-0,0568***	-0,052***	-0,0117***	-0,0137***	0,0125**
el	30-39	-0,0252***	-0,0059**	0,0116***	0,0467***	0,0721***	0,0748***	0,0685***
el	40-49	0,037***	0,0821***	0,0885***	0,0762***	0,0514***	0,0583***	0,0148**
el	50-59	0,0522***	0,0634***	0,0546***	0,0646***	0,0778***	0,0459***	0,0665***
es	20-29	-0,076***	-0,0709***	-0,0747***	-0,0635***	-0,0663***	-0,0678***	-0,0803***
es	30-39	-0,0927***	-0,0737***	-0,0762***	-0,0711***	-0,1022***		-0,1389***
es	40-49	-0,0281***		-0,0289***	-0,0292***	-0,0361***	-0,0489***	
es	50-59	-0,0386***	-0,0262***	-0,0222***	-0,0349***	-0,0476***	-0,069***	-0,0751***
fi	20-29	-0,053***	-0,0478***	-0,0486***	-0,0533***	-0,0487***	-0,0571***	-0,0416***
fi	30-39	-0,0634***	-0,0599***	-0,0594***	-0,0779***	-0,0969***	-0,0994***	-0,091***
fi	40-49	-0,0682***		-0,0675***	-0,0703***	-0,0839***	-0,0923***	-0,114***
fi	50-59	-0,0414***	-0,0432***	-0,0449***	-0,06***	-0,0662***		-0,0528***
fr	20-29	-0,0246***	-0,0541***	-0,0417***	0,0107***	0,0416***	0,0165***	0,0313***
fr	30-39	0,0057**	0,0106***	0,0233***	0,0967***	0,2166***	0,2119***	0,1796***
fr	40-49	0,0507***	0,0366***	0,0198***	-0,0119***	0,0317***	0,0355***	0,0679***
fr	50-59	-0,2681***	-0,2058***	-0,1714***	-0.0036	-0,0586***	-0,0562***	0,0103**
hu	20-29	-0.0081	-0,0171***	-0,0203***	-0,0649***	-0,1075***	-0,112***	-0,1599***
hu	30-39	-0,0429***	-0,0189***	-0,0198***	-0,0672***	-0,1226***	-0,1142***	-0,1208***
hu	40-49	-0,0502***	-0,0594***	-0,0642***	-0,0991***	-0,1564***	-0,1635***	-0,2044***
hu	50-59	-0,0609***	-0,0917***	-0,094***	-0,1213***	-0,1378***	-0,1422***	-0,1512***
it	20-29	-0,0583***	-0,0441***	-0,0427***	-0,0411***	-0,019***	-0,0149***	-0,0641***
it	30-39	-0,044***	-0,0412***	-0,044***	-0,039***	-0,0717***	-0,0786***	-0,1225***
it	40-49		-0,0652***	-0,0406***	-0,0375***	-0,0767***	-0,0621***	-0,074***
it	50-59	-0,083***	-0,0693***	-0,0709***	-0,0754***	-0,0651***	-0,0506***	-0,1163***
lt	20-29	-0,0484**	-0,0961***	-0,1086***	-0,0654***	-0,0592***	-0,0617***	-0,0678***
lt	30-39	-0,0959***	-0,1427***	-0,1506***	-0,1769***	-0,131***	-0,1073***	-0,1419***
lt	40-49	-0,1211***	-0,1781***	-0,188***	-0,2153***	-0,1284***	-0,1111***	-0,148***
lt	50-59	-0,1192***	-0,124***	-0,1205***	-0,1079***	-0,1201***	-0,094***	-0,2018***
lv	20-29	0	0,0513***	0.011	0,0682***	0,0498**	0,0318*	-0,0553**
lv	30-39	0	0.0155	0.0178	0,1328***	0,1359***	0,1466***	0,2131***
lv	40-49	0	0.0132	0.0041	0,0788***	0,1103***	0,1539***	0,2805***
lv	50-59	0		-0.0115	0.0199	0,0634**	0,0858***	0,1969***

nl	20-29	-0,0864***	-0,0513***	-0,0493***	-0,0289***	-0,0407***	-0,0483***	-0,0422***
nl	30-39	-0,0723***	-0,0639***	-0,0667***	-0,0779***	-0,0981***	-0,0861***	-0,1021***
nl	40-49	-0,06***	-0,0578***	-0,0622***	-0,0708***	-0,099***	-0,1084***	-0,1296***
nl	50-59	-0,0145***	-0,0379***	-0,0394***	-0,0513***	-0,0524***	-0,0637***	-0,0636***
no	20-29	-0.0044	-0,015***		-0,0391***	-0,0466***	-0,05***	
no	30-39				-0,0356***	-0,0478***		
no	40-49				-0,0304***		-0,047***	-0,0662***
no	50-59			-0,0089*	-0.0069	-0,0216**		
pl	20-29	-0,08***	-0,079***	-0,0937***	-0,1569***	-0,2029***	-0,2069***	-0,2247***
pl	30-39	-0,1002***	-0,1108***	-0,1093***	-0,1797***	-0,2136***	-0,2129***	-0,2253***
pl	40-49	-0,1043***	-0,1191***	-0,1488***	-0,217***	-0,2411***	-0,2395***	-0,2473***
pl	50-59	-0,1124***	-0,171***	-0,1846***	-0,2666***	-0,3018***	-0,3038***	-0,3001***
pt	20-29	-0,04***	-0,0428***	-0,0509***	-0,0895***	-0,1219***	-0,1218***	-0,1298***
pt	30-39	-0,0189***	0,0366***	0,0479***	0,0202***	-0,0363***	0,0124***	-0.0048
pt	40-49	-0,1044***	-0,1177***	-0,1344***	-0,1335***	-0,1956***	-0,201***	-0,2403***
pt	50-59	-0,1534***	-0,1708***	-0,1501***	-0,1207***	-0,0871***	-0,1381***	-0,0468***
ro	20-29	-0,0927***	-0.0035	-0,0281***	-0,0678***	-0,1569***	-0,1431***	-0,1314***
ro	30-39	-0,1341***	-0,0615***	-0,0845***	-0,1945***	-0,1612***	-0,1935***	-0,2272***
ro	40-49	-0,2205***	-0,1149***	-0,1253***	-0,1679***	-0,1981***	-0,2138***	-0,0779***
ro	50-59	-0,0855***	-0.004	-0,0427***	-0,0785***	-0,0355**	-0,1098***	-0.0086
uk	20-29	-0,0441***	-0,0562***	-0,0485***	-0,042***	-0,0631***	-0,0723***	-0,0217***
uk	30-39	-0,0336***	-0,012***	-0,0114***	0.0032	-0,0087***	-0,0104***	0.0008
uk	40-49	-0,021***	-0,0159***	-0,0068**	0,0127***	0,0327***	0,0389***	0,0598***
uk	50-59	-0,011***	0,0251***	0,0212***	0,0293***	0,1198***	0,1355***	0,1998***

## ABOUT NEUJOBS

“Creating and adapting jobs in Europe in the context of a socio-ecological transition”

NEUJOBS is a research project financed by the European Commission under the 7th Framework Programme. Its objective is to analyse likely future developments in the European labour market(s), in view of four major transitions that will impact employment - particularly certain sectors of the labour force and the economy - and European societies in general. What are these transitions? The first is the **socio-ecological transition**: a comprehensive change in the patterns of social organisation and culture, production and consumption that will drive humanity beyond the current industrial model towards a more sustainable future. The second is the **societal transition**, produced by a combination of population ageing, low fertility rates, changing family structures, urbanisation and growing female employment. The third transition concerns **new territorial dynamics** and the balance between agglomeration and dispersion forces. The fourth is a **skills (upgrading)** transition and its likely consequences for employment and (in)equality.

### Research Areas

NEUJOBS consists of 23 work packages organised in six groups:

- **Group 1** provides a conceptualisation of the **socio-ecological transition** that constitutes the basis for the other work-packages.
- **Group 2** considers in detail the main drivers for change and the resulting relevant policies. Regarding the drivers we analyse the discourse on **job quality**, **educational** needs, changes in the organisation of production and in the employment structure. Regarding relevant policies, research in this group assesses the impact of changes in **family composition**, the effect of **labour relations** and the issue of financing transition in an era of budget constraints. The regional dimension is taken into account, also in relation to **migration** flows.
- **Group 3** models economic and employment development on the basis of the inputs provided in the previous work packages.
- **Group 4** examines possible employment trends in key sectors of the economy in the light of the transition processes: energy, health care and goods/services for the **ageing** population, **care services**, housing and transport.
- **Group 5** focuses on impact groups, namely those vital for employment growth in the EU: **women**, the **elderly**, immigrants and **Roma**.
- **Group 6** is composed of transversal work packages: implications NEUJOBS findings for EU policy-making, dissemination, management and coordination.

For more information, visit: [www.neujobs.eu](http://www.neujobs.eu)

Project coordinator: Miroslav Beblavý ([Miroslav.Beblavy@ext.ceps.eu](mailto:Miroslav.Beblavy@ext.ceps.eu))

