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Precarious and less well-paid? Wage differences between permanent and fixed-term contracts across the EU countries

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Abstract

We analyse wage differences between permanent and fixed-term contracts across EU countries using data from the European Structure of Earnings Survey. We find that after controlling for individual and job characteristics, workers on permanent contracts earn on average about 15% more than workers on fixed-term contracts with similar observable characteristics. The permanent contract wage premium is higher for men, workers at middle age and with middle education, and performing non-elementary occupations. We also find that permanent workers enjoy a higher education and age wage premium. We explore cross-country differences in the wage premium for permanent workers and correlate them with indicators of labour market institutions. Results indicate that a high wage premium for workers with permanent contracts is associated with high levels of employment protection for workers on permanent contracts, a high share of temporary employment in the economy, lengthy periods of unemployment benefit entitlement, and low minimum wages.

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1. INTRODUCTION

Employment relations are governed by various types of employment contracts. In the EU countries the permanent contract employment relationship is the prevalent form of contract. However, in many EU countries temporary contracts assumed a substantial share of total employment. The debate on labour market segmentation was mostly driven by concerns that individuals move from one temporary contract to another. Another dimension, sometimes neglected, is that segmentation can lead to wage inequality not justifiable on the basis of individual characteristics.

In this paper we analyse the main features of the wage differences between permanent and fixed-term contracts and what sources are driving these differences, including the role of labour market institutions. We aim at digging deeper into these issues by exploiting comparable data across the EU countries.

In perfectly competitive markets, one would expect that permanent workers would receive lower wages as compared with temporary workers with equal characteristics and under same conditions, in line with the theory of compensating wage differentials (Rosen, 1986) and the so-called "bonding argument" (Lazear, 1990), whereby employers would post wages reduced by the expected dismissal costs. Conversely, empirical evidence points to the existence of a permanent contract wage premium. This wage premium appears not negligible in magnitude and has been estimated also in countries with legislation requiring that wage floors apply irrespective of the type of contract, as it is the case in the EU.[1]

The apparent puzzle of lower protection and lower pay finds an explanation once moving away from competitive labour market settings. Bargaining models predict that permanent workers earn more because employment protection reduces the outside option of employers (e.g., Lindbeck and Snower, 2001; and Boeri, 2011). As a rule, one should therefore expect that permanent workers, being "insiders", would be both more protected and better paid than fixed-term "outsiders", and that the wage premium is bigger the bigger the extra protection offered to permanent labour.[2] An alternative explanation relies on asymmetric information. If the quality of job matching is not known to employers at start of an employment relationship, so that the worker-firm match is an "experience good" (Jovanovic, 1979), fixed-term contracts would allow firms to learn about the matching quality without having to incur separation costs. The wage gap between fixed-term and permanent workers would therefore be linked to the fact that firms are unable to screen the ability of newly-recruited workers, which are more likely to be employed with fixed-term contracts.

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[1] Council Directive 1999/70/EC of 28 June 1999 on fixed-term work requires that legally binding wage floors apply equally to workers with permanent and fixed-term contracts. Even with this legislation in place and complied with, a wage premium between permanent and temporary workers could arise on top of erga-omnes minimum wages or collectively bargained wage floors or because of a different allocation of workers to different grades of the wage scale based on the type of contract.

[2] Centeno and Novo (2013) explored, in a quasi-experiment setting, a change in the Portuguese Labour Code that increased the protection of permanent workers. They concluded that the cost of the additional protection for permanent workers was mostly borne by fixed-term workers.

Empirical studies on wage differences between permanent and fixed-term contracts at country level include Blanchard and Landier (2002) for France, Booth et al. (2002) and Brown and Sessions (2003) for the United Kingdom, De la Rica (2004) for Spain and Hagen (2002) for Germany. In these studies the wage premium for a permanent contract varies between 6% and 23%. Other studies at country level analysed the wage premium across the entire wage distribution by means of estimation of quantile regressions. Bosio (2009) and Comi and Grasseni (2012) show that in Italy the wage penalty for fixed-term workers is higher at the bottom of the distribution. Mertens et al. (2007) found the same evidence for Germany, while for Spain they show that the wage penalty varies little across the wage distribution.

Our study builds on similar previous comparative analysis of wage differentials by type of contract across countries. [3] Stancanelli (2002) analyses the wage premium for 12 EU countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Denmark and the United Kingdom) and finds that permanent workers have a premium of around 13%. Boeri (2011) presents estimates for the same group of countries plus Luxembourg, Sweden and Finland and estimates a wage differential between permanent and fixed-term contracts of about 21%. Comi and Grasseni (2012) analyse the wage gap in 12 EU countries (Austria, Belgium, Germany, France, Greece, Italy, Portugal, Spain, the Czech Republic, Hungary, the Slovak Republic and Poland) and show a premium for permanent workers of about 16%. Kahn (2012) analyses the wage differences for the same group of countries as Stancanelli (2002) plus Finland and estimates an hourly wage gap of about 14%. Kahn (2013) deepens this analysis by analysing the structure of wage premium by workers characteristics, especially the difference in wage premium for immigrant workers.

The results found in these empirical studies are to some extent sensitive to the methods used. For instance, Booth et al. (2002), Mertens et al. (2007) and Kahn (2013) find considerably lower estimates when controlling for unobserved heterogeneity by including individual fixed effects. The estimates could also vary when controlling for the selection of individuals according to the type of contract: Hagen (2002) show that taking into account self-selection, the estimated negative wage effects raises significantly, indicating that high-ability workers are more likely to self-select into temporary contracts. Bosio (2009) instead finds that correcting for self-selection in temporary contract only slightly modifies the magnitude of wage gap.

Our study aims at contributing to the empirical literature in a number of ways. First, we analyse wage differences by type of contract across 26 EU countries: the EU members in 2010, except Sweden because no data were available for type of contract. This adds to the

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[3] The specification of the wage equation and the data source varies among these studies. Boeri (2011) uses data from European Community Household Panel (ECHP) and from the European Union Survey on Income and Living Conditions (EU-SILC) and controlled for education, education squared, tenure and tenure squared; Stancanelli (2012) uses data from the ECHP, 1996 and 1998 releases and controlled in addition for age, sector, occupation and unemployment history; Comi and Grasseni (2012) uses EU-SILC data and controlled for age, age squared, education, gender, part-time/full-time, occupation and industry; Kahn (2012) uses ECHP data and controlled for age, age squared, education, regional unemployment rate and year dummy variables.

empirical comparative studies that focused generally on Western EU countries. Second, we analyse the structure of the wage premium by analysing the role played by gender, age, education and occupations. Third, we aim at taking a step forward in analysing the role played by labour market institutions in shaping the wedge between permanent and fixed-term contracts. Although strong conclusions are not feasible due to the still relatively small cross-section of countries, the number of EU countries analysed is larger than the one considered in previous analogous studies and provides the basis for venturing into such an assessment.

As an important focus of the analysis is the cross-country comparison of the estimated wage premium for permanent contracts, the estimation methodology as well as the empirical specification is kept identical across countries. To ensure a simple, transparent and homogenous specification across the board, the issue of self-selection is not taken into account, building on the expectation that the extent of self-selection bias does not vary greatly across countries, so that the cross-country comparisons of wage premia is not strongly affected.

Our results show that the average wage premium for permanent workers for the 26 EU countries in the sample is about 15%. The wage premium for permanent contracts tends to be higher among middle age workers, among workers with middle education attainment and generally higher for men. A permanent contract also raises the premium for age and education. Results for occupation category show that differences between the two types of contract are lowest for elementary occupations. The size of the premium varies substantially across countries, with the largest wage premia being recorded in some Continental countries and some Central and Eastern European countries. The correlation of our results with prevailing labour market institutions indicate that the premium tends to increase with the protection of permanent contracts, with the share of temporary workers and the maximum duration of unemployment benefits. Minimum wage also seems to play a role in reducing wage differences between fixed-term and permanent workers among the young and low educated groups.

The remainder of the paper is organised as follows: the next section describes the data and summarise the main patterns. Section 3 describes the empirical strategy. Section 4 summarises the econometric results and presents a sensitivity analysis by age, education, gender and occupation. Section 5, relates the results obtained for the adjusted wage premium with the employment protection legislation, unemployment benefits and collective bargaining characteristics, including the relative level of the minimum wage. Section 6 concludes.

2. DATA AND PRIMA FACIE EVIDENCE

2.1 DATA

We use data from the 2010 European Structure of Earnings Survey (SES, hereafter), Eurostat, which provides harmonised information across EU countries on various variables affecting

hourly earnings at individual level. [4] These characteristics include: age, education, gender, activity sector, ownership (whether public or private), occupation, and, crucially for our analysis, information on whether the employee is on a fixed-term contract or on an open-ended contract.

The dependent variable is hourly earnings. All explanatory variables are categorical. Our variable of interest, type of contract, identifies individuals on permanent and fixed-term contracts. The question in SES regarding the type of contract distinguishes between three categories: contract of indefinite duration; temporary/fixed duration (except apprentices, but including trainees or students receiving remuneration); and apprentices. As information regarding apprentices is not available for various countries, we reduced the taxonomy of contracts to two types: permanent and other contracts, with other contracts being interpreted as fixed term, as apprentices are normally hired under non-permanent contracts.

Age is aggregated in three groups. The first age group comprises workers aged between 15 and 29 years old; the second comprises workers aged between 30 and 49 years old; and the third group comprises workers aged 50 years old and older. Educational attainment grouping is based on the UNESCO International Standard Classification of Education. The first level of education comprise workers with primary and lower secondary education (ISCED codes 0, 1 and 2), the second group comprise workers that have completed upper secondary or post-secondary non-tertiary education (ISCED codes 3 and 4) and the last group include workers with first and second stage tertiary education (ISCED 5 and 6).

The economic activity sector is grouped in three broad categories: industry, which comprises mining, manufacturing, industry and construction; wholesale and retail trade and accommodation, food services activities; and all other services, including public administration and defence.

The occupational category is grouped according to the International Standard Classification of Occupations (ISCO). Nine occupational groups are used in the estimations: managers; professionals; technicians and associate professionals; clerical support workers; service and sales workers; skilled agriculture, forestry, and fishery workers; craft and related trade workers; plant and machine operators and assemblers; and elementary occupations. Information on occupation category skilled agriculture, forestry, and fishery workers is available only for a limited number of countries.

The dataset used in the empirical estimation employs average hourly wages for combinations of characteristics (e.g. age group, education etc.). Hence, the span of the dataset is that of all possible combinations of the characteristics considered. The information in SES is obtained from a survey on 123,662,368 individuals across 26 countries (all EU countries except Sweden and Croatia). The data concern employees working in firms with ten or more

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[4] The same data have been previously used by De Castro et al. (2013) and European Commission, (2014).

employees. The sample is constructed in such a way to make it comparable to the overall population.[5]

2.2   UNADJUSTED EARNINGS DIFFERENTIALS BETWEEN PERMANENT AND FIXED-TERM CONTRACTS

Figure 1 presents the difference in average earnings between permanent and fixed-term contracts for the 26 countries in our sample. In all but the Baltic countries, fixed-term contracts have lower average earnings per hour than permanent contracts. Differences across countries are wide. The largest gaps between permanent and fixed-term contracts are recorded in the Netherlands, Luxembourg and Poland, while in Cyprus, Austria, Denmark and Malta that difference is small. Among the Baltic countries, Estonia records the largest premium for fixed-term contracts.

<p style="text-align:center">Figure 1</p>

Figure 2 shows the average difference in earnings between indefinite and fixed-term contracts by age, education and gender. Older workers receive generally the highest premium for a permanent contract. However, in some countries, the highest premium is also often taken by the young, as it is the case of the Baltic countries.

There is no clear cross-country pattern regarding the relation between the permanent contract wage premium and educational attainment. However, it is visible that wage premiums for permanent contract vary substantially among education groups within the same country and across countries. Although it is not possible to define a clear pattern, the gap is generally larger for medium or higher education groups while the low-education group generally commands a lower permanent contract wage premium.

<p style="text-align:center">Figure 2</p>

The decomposition by gender shows that the average differences in earnings between contracts of indefinite duration and fixed-term contracts are generally larger for men than for women. This pattern is observed in most countries.

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[5] The total number of employees is the following (in brackets the number of observations per country in the sample): 2228464 AT (883); 2268151 BE (667); 1805678 BG (1031); 212228 CY (462); 3453693 CZ (1652); 23007444 DE (1405); 2487131 DK (1461); 381607 EE (785); 9328311 ES (1218); 1456498 FI (1424); 17494578 FR (1194); 1529093 EL (652); 2039750 HU (1228); 964563 IE (828); 10272223 IT (978); 930804 LT (610); 257730 LU (401); 594203 LV (1107); 129736 MT (415); 6311001 NL (1104); 7400045 PL (1404); 2334577 PT (926); 3967129 RO (823); 572142 SI (1204); 1594056 SK (1334); 20641536 UK (1044). The sample weights are used in both the descriptive and econometric analysis presented in the following sections.

Figure 3 shows the proportion of employees on fixed-term contracts for the 26 countries. The highest shares of temporary contracts are found in Poland, Slovenia, Portugal and Spain, all with shares above 20%. Romania, Denmark and Cyprus record the lowest shares of temporary contracts. The figures, in some cases, underestimate or overestimate the official Eurostat data on the proportion of temporary workers in each country in 2010[6]. One possible reason for that difference could be attributed to the fact that the data in our sample do not cover workers in firms with less than ten employees.

<div align="center">Figure 3</div>

The frequencies of permanent contracts by employee's characteristics are displayed in Figure 4. Young workers are more often on temporary contracts than the other age groups, while older workers have generally the lowest share of employees on temporary contracts.

Regarding education, the share of employees on fixed-term contracts is highest among individuals with low education attainment in more than half of the countries. In Poland, about 38% of employees in the low education group are on fixed-term contract. This compares with a total average of 28% of employees on fixed-term contracts in the country. However, in a number of countries, employees in the high education group have a substantial higher share of temporary workers as compared to the other two education groups. Austria, Germany, Malta and Finland are among the most notable cases.

<div align="center">Figure 4</div>

The decomposition of the proportion of temporary contracts by gender shows that, on average, there are not large differences in the proportion of men and women on temporary contracts. It is also not possible to identify a cross-country pattern as to whether women or men are more likely to be on fixed-term contracts.

3.   ESTIMATING THE PERMANENT CONTRACT WAGE PREMIUM

3.1   METHODOLOGY AND BASIC SPECIFICATION

The empirical estimation of the wage premium for permanent contracts needs to take into account that workers with different types of contracts differ for their characteristics and that such a difference in characteristics contributes to explain differences in average earnings.

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[6] The proportion of temporary workers is considerably higher than the Eurostat figures for CZ, SK and SI, and considerably lower for CY, NL, FR, DE and DK.

With a view to control for such differences, a human capital earnings function (Mincer, 1974) is estimated according to the following specification:

$$w_i = \beta_1 + \beta_2 . contract_i + \beta_3 X'_i + \varepsilon_i \qquad (1)$$

The dependent variable, earnings per hour, is in logarithm; ε_i is assumed to be an independent and identically distributed error term reflecting unobservables as well as possible measurement error. Our variable of interest – contract – is a dummy variable that assumes value 1 if the individual is on an indefinite contract and 0 otherwise. The vector of control variables includes the following individual characteristics: age group, with the excluded category being young employees, education group, with the omitted category being middle educated workers; gender, which assumes value 1 if female; activity sector, which assumes value 1 if workers in in the industry sector; and sector, which assumes value 1 if workers in the public sector.

We first estimate the model by OLS for the pooled sample with country fixed-effects and then we estimate the model for each single country. The estimate for β_2 obtained in equation (1) gives the wage premium (penalisation) for holding a permanent contract. The estimation of equation (1) also gives an overview of the earnings formation in the 26 countries of our sample.

Next, we analyse the gap in the average earnings by type of contract by means of the Oaxaca-Blinder decomposition (Oaxaca, 1973; Blinder, 1973). This decomposition is based on the separate estimation for fixed-term and permanent workers of the Mincerian-type equation above. After the estimation of the model jointly for fixed-term and permanent workers, the difference of the average earnings between the two groups can be decomposed as follows[7]:

$$\overline{W}^P - \overline{W}^{FT} = (\overline{X}^P - \overline{X}^{FT})\hat{\beta}^* + \left\{\overline{X}^P\left(\hat{\beta}^P - \hat{\beta}^*\right) + \overline{X}^{FT}\left(\hat{\beta}^* - \hat{\beta}^{FT}\right)\right\} \qquad (2)$$

where $\overline{W}^P$ and $\overline{W}^{FT}$ are the average earnings for permanent and fixed-term contracts; $\overline{X}^P$ and $\overline{X}^{FT}$ are the observed average characteristics and permanent and fixed-term individuals; $\hat{\beta}^P$, $\hat{\beta}^{FT}$ and $\hat{\beta}^*$ are the coefficients estimated using equation (1) for permanent, fixed-term and joint estimation respectively.

The first term on the right-hand side of equation (2) is the "explained component": it represents the contribution of individual characteristics in explaining earnings differences between the two types of contract. The second term is the "unexplained component", which is

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[7] See Jann (2008) for details regarding the different types of decomposition and respective implementation in Stata.

the difference in the coefficients or how different characteristics are rewarded differently between the two groups and is equal to the estimate for β_2 obtained in equation (1).

3.2   BASELINE RESULTS

Estimation results of equation (1) for the pooled observations for all 26 countries are presented in Table 1. Results are in line with expectations. Earnings increase with age and the rate of growth decreases between middle age and old age workers. Workers with higher education attainment earn on average more than their lower educated peers. There is a considerable negative wage premium for women. Working in the sector trade, retail and accommodation yields considerably lower average wages than working in other services, while working in the industry sector yields a wage premium. Public sector pays a positive wage premium. All occupations pay more than elementary occupations (excluded category), the only exception being the occupation skilled agriculture, fishery and forestry. The results of the estimation of equation (1) for each of the 26 countries are reported in Table 1A in the Appendix.

Table 1

The estimated adjusted wage gap by type of contract is 0.139 log points in the EU, meaning that workers on permanent contracts earn on average 14.9% more than observationally similar workers on fixed-term contracts. Our estimation of the adjusted wage premium for permanent workers is higher than that found by Stancanelli (2002) and Kahn (2012), similar to that found by Comi and Grasseni (2012) and considerably lower than that reported by Boeri (2011). We have, however, to note that we are comparing results from studies that have analysed different groups of countries, being ours the most comprehensive in country coverage. In fact, when we restrict our sample to the same countries analysed by Stancanelli (2012) and Kahn (2013) we obtain an estimate of 0.122 log points, which is very close to that obtained by those two studies.

Figure 5

Figure 5 shows the estimation results for the permanent contract wage premium for each country. In all countries, earnings per hour of permanent workers are higher than those of temporary workers. The adjusted wage premium for a permanent contract ranges between about 0.02 log points in Lithuania and 0.206 in Poland. Together with Lithuania, also Latvia, Estonia and Denmark present relatively small adjusted differences in earnings between the two types of contract. By contrast, Luxembourg, Cyprus and Germany have the largest wage premiums for permanent contracts after Poland. Our results for the Czech Republic, Hungary,

Slovakia and Poland, are very close to those obtained by Comi and Grasseni (2012), the only of the four comparative studies referred in our literature review to include Eastern European countries. As for the countries that have also been analysed by other comparative studies, our estimates are broadly within the range of estimates found by the empirical literature, although for some countries the range of estimates is quite wide.[8]

Our results fit only to some extent usual taxonomies of labour market institutions across the EU (e.g., European Commission, 2007; Esping-Andersen, 1990).[9] Among the *Nordic countries* Denmark and Finland show a low premium, while in the Netherlands the premium is among the highest in Europe. Among the *Continental countries* Luxembourg and Germany record premiums among the highest in Europe, but in France the premium is only 0.075 log points and only slightly higher in Belgium and Austria. Among the *Anglo-Saxon countries* the United Kingdom, Ireland and Malta have a premium below the average and relatively homogeneous, however Cyprus recorded the third highest premium for permanent contracts. The *Southern countries* (Portugal, Spain and Italy) have a relatively homogeneous premium and below average. For *Central and Eastern European countries*, the differences are very large as it contains on one side Poland with the largest wage premium and the Czech Republic with the fifth highest and on the other side the Baltic countries with the lowest wage premiums.

Estimation results of the Oaxaca-Blinder decomposition are presented in Table 2. The first column presents the difference of the mean predictions between log wages of permanent and temporary workers. The second column is the explained component, or by how much the mean wage would increase if workers on fixed-term contracts had the same characteristics of permanent workers. The third column is the unexplained component, which is the wage gap discussed above.

Table 2 shows that for the pooled observations for the 26 countries, the predicted total wage differential between the two types of contract is 0.406 log points. About 66% of the difference is explained by better earnings characteristics of permanent workers. Adjusting the characteristics of fixed-term workers with those on permanent contracts would still leave unexplained 34% of the observed gap between the two types of contracts.

Results at the country level of the Oaxaca-Blinder decomposition show that the predicted differences in average earnings between permanent and temporary workers are positive in all countries but Estonia and Lithuania. That difference is small and not statistically significant

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[8] For instance, for Germany, Stancanelli (2002) estimated a wage premium for permanent contracts of 0.11 log points for women and 0.15 for men; Boeri (2011) estimated a premium of 26.6%, while the premium estimated by Comi and Grasseni (2012) is even higher at 0.31 log points.

[9] The taxonomy proposed by the European Commission (2007) largely overlaps with the seminal work in Esping-Andersen (1990). It covers 22 EU countries which are classified into five groups on the basis of principal component analysis: Nordic Countries, Anglo-Saxon countries, Continental countries, Southern countries, Central and Eastern European countries. The five missing EU countries were for the purpose of this paper allocated on the basis of unemployment benefit systems characteristics as follows: Malta and Cyprus were allocated to the Anglo-Saxon group of countries, Luxembourg to the Continental group, Romania and Latvia to the Central, Eastern group of countries (as in Stovicek and Turrini, 2012).

in Cyprus, Lithuania and Latvia. By contrast, the difference is largest in Luxembourg, the Netherlands and Poland.

In general, a substantial share of the predicted difference in wages between permanent and fixed-term contract workers is explained by the endowments of each group. For instance, in Belgium, about 70% of the difference is explained by better earning endowments of permanent workers. However, there are a number of countries where the explained difference is below 50% and in Austria, Cyprus, Estonia and Lithuania the earnings characteristics of fixed-term workers are estimated to be better than those of permanent workers.

4.   DOES THE PERMANENT CONTRACT WAGE PREMIUM DIFFER ACROSS WORKERS' GROUPS?

We stratify the data in a number of different ways to estimate equation (1) separately for the three age groups, the three education categories, for male and female, and per occupation. The stratification of the sample allows us to explore the structure of the wage premium. The empirical evidence shows that the wage premium is generally higher for men. A possible explanation is that women even in permanent jobs are in segregated labour markets (Kahn, 2013). Regarding age, a lower premium for young workers could be expected as they are likely to have low seniority and consequently part of the permanent contract wage premium linked to seniority would not show up. Explaining difference in wage premium by skill and occupation groups may be less obvious and differences in the shape of the wage distribution across countries are also likely to play a role.

Table 3 shows the results of the estimation of equation (1) by age group. Since temporary contracts are used as a screening device for new recruits, one would expect to observe a high permanent contract wage premium especially among prime-age and senior workers. Permanent workers in those age groups would be more likely to benefit from higher seniority premia than newly-recruited peers on temporary contracts. Additionally, the presence of wage floors is expected to compress the permanent wage premium for young workers. Results are supportive of such expectation. For the pooled regression, the difference between workers on permanent and fixed-term contracts is lowest for the young cohort. The permanent contract wage premium is highest within middle age cohort and then decreases for workers aged 50 and over.

Such pattern is most often confirmed in country-level estimates. In more than half of the countries, the lowest average difference in earnings between types of contracts occurs in the

young age group. It is also observed that in other countries, such as Denmark, Estonia, France, Malta and Slovakia, the largest difference in earnings by type of contract occurs within the youngest cohort. These are also the countries that have a less steep age-earnings profile (Table 1A).

Table 4

The next sensitivity analysis involves the estimation of our empirical model by education groups. A priori, it is not obvious whether to expect a higher or a lower wage premium for high-education workers. On the one hand, high-education workers could be less easily substitutable and imply a better bargaining position, which could contribute to a lower wage difference between permanent and temporary contracts. On the other hand, labour market institutions such as the minimum wage could compress the wage distribution at the bottom, thereby contributing to a lower permanent wage premium for low-skilled workers.

Table 4 shows that for the pooled observations the premium for a permanent contract varies from 0.086 log points for individuals in the low education group and 0.148 log points for individuals in the middle education group. The premium for individuals with higher education is 0.140 log points. The finding that the wage premium for permanent contracts is the lowest for low-education workers is found in a majority of countries, with the highest premium being either for middle or high-education workers.

Does the fact that the permanent contract wage premium is higher for relatively well educated workers also imply that the education wage premium is higher for workers with a permanent contract? To shed light on this issue we have estimated equation (1) separately for permanent and fixed-term contracts. The results, shown in Table 3A in the Appendix, show that, over the whole sample of countries, the education wage premium for fixed-term workers is substantially lower than that for permanent workers. The difference is particularly striking for secondary education, with a wage premium that is almost twice higher for permanent workers. The other result that stands out in Table 3A is that workers with permanent contracts have a considerably higher wage premium linked to age, which holds when moving both from young to middle age and from middle to old age. Overall, the evidence suggests that a permanent contract implies a higher wage especially for workers with education level above primary and middle age, and that the wage premium from education and age is higher for permanent workers.

Table 5

Results for the estimation of equation (1) separately for men and women are reported in Table 5. In line with previous findings (e.g. Stancanelli, 2002; Booth et al., 2002; and Comi

and Grasseni, 2012), it is found that the wage premium for permanent contracts is considerably higher for men than for women. Across the whole panel of countries, men on permanent contracts earn 0.162 log points more than their peers on fixed-term contracts, while the premium for women is estimated at 0.115 log points. The pattern that men have a higher permanent job wage premium than women is observed for the majority of countries.

Our last sensitivity analysis involves the estimation of equation (1) by occupation group. Results are summarised in Figure 6 for the pooled observations while estimation results at the country level are reported in Table 2A in the Appendix. We observe that workers in elementary occupations and sales workers command on average the lowest wage premium, while the highest premium is earned by permanent workers with skilled occupations in agriculture, and with managerial, professional, technical, clerical jobs. The evidence, in this respect, suggests that permanent contracts are associated with higher wages especially for workers with non-elementary occupations. A possible reason is that these type of workers have a better bargaining position in individual negotiations and that, for this workers, pay is to a less extent determined by statutory or collectively bargained wage floors. A better bargaining position offered by a permanent contract may affect a higher fraction of the total wage, as a result of individual bargaining, as compared with workers with elementary occupations.

5. DO LABOUR MARKET INSTITUTIONS MATTER FOR THE PERMANENT CONTRACT WAGE PREMIUM?

Our results in the previous section indicate that there is a substantial permanent contract wage premium that cannot be explained by observable characteristics of individuals. There is considerable cross-country heterogeneity in the estimated wage premium, which fits with usual taxonomies of socio-economic systems only to some extent. This section performs a number of correlations between the estimated wage premia and a number of indicators of labour market institutions with a view to acquire a better insight into the role that institutions play in shaping differences in the wage premium across countries.

A number of different indicators are considered for the following labour market institutions:

(i) **Employment Protection Legislation (EPL)**. The prior is that the higher protection for permanent workers as compared to that of fixed-term workers, the higher their bargaining power and wage. Indicators measuring the strictness of EPL are available from the OECD for most EU countries. With a view to capture whether it is mostly EPL strictness for permanent workers or low protection for fixed-term that matters, a number of alternative EPL dimensions are examined. In addition to EPL indicators, the share of temporary contracts is also taken into account. Despite this is an endogenous variable, it can be useful to get insight on the link between dual labour markets and the bargaining power of permanent workers.

(ii) **Unemployment benefits**. Workers that are entitled to unemployment benefits have an outside option in wage bargaining which is higher the more generous is the unemployment benefits system. This outside option permits in turn to obtain higher wages as a result of bargaining. Since workers with higher seniority are more likely to be entitled to receive unemployment benefits and since senior workers are more likely to be employed with an open-ended contract, the expectation is that more generous unemployment benefits are associated with a higher wage premium for permanent workers. We consider indicators of both duration and net replacement rates of unemployment insurance at different length of unemployment spells.

(iii) **Wage floors**. Wage floors are expected to reduce the size of the permanent contract wage premium by imposing a lower bound to the wage that can be paid to workers at the bottom of the scale distribution. A negative relation between the level of wage floors and the wage premium is expected especially in countries, like those that are members of the EU, where the legislation requires that legally binding wage floors apply equally to open-ended and fixed-term contracts. In such a case, the permanent wage premium would arise mostly from a different allocation of permanent workers on the wage ladder as compared with temporary workers, and from the portion of the wage linked to individual bargaining: the higher the level of statutory and collectively bargained wage floors, the lower the relative importance of individual bargaining in determining the overall wage level. The incidence of statutory wage floors is measured as the share of the minimum wage on the median wage. Regarding the incidence of collectively bargained wage floors, direct measures of the level of bargained wages are not easily available. As an alternative, variables proxying the pervasiveness of collective bargaining are considered in the analysis.

Table 6

Results are presented in Table 6 in terms of cross-country rank correlations. In light of theoretical explanations of the permanent contract wage premium (putting emphasis on fixed-term contracts for junior workers) and the empirical evidence presented above (indicating that premium for permanent workers varies considerably across age groups), correlations are also computed separately for the wage premium of young and old workers.[10]

Results show, as expected, a positive correlation between the wage premium of a permanent contract and the level of employment protection of regular contracts. Such correlation increases substantially and becomes statistical significant when considering the wage premium of old workers. The most likely explanation is that EPL often provides higher protection to the elderly, both in term of severance payments and notice periods increasing with tenure, and because the legislation and the judicial practice tend to discourage the layoff

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[10] Correlations of the wage premia by education groups were also computed. As differences are of little size, results are not presented.

of older workers with little re-employment opportunities. This hypothesis seems supported from the correlation of the wage premium with the different components of the EPL indicator. The component summarising the length of notice period and size of severance payment (in case of fair dismissal) at different tenure indicates that the positive correlation between the wage premium of older workers and EPL is mostly linked with notice and severance entitlements for workers with long tenure, while notice and severance at short tenure is positively correlated with the premium of young workers. The evidence also indicates that both the EPL component referring to the legal definition of fair dismissal and the possibility of reinstatement are positively (albeit not significantly) correlated with the wage premium, with the correlation being higher for older workers.

The indicator of EPL strictness for fixed-term contracts exhibits a weak correlation with the wage premium, which is, contrary to expectations, positive. This positive correlation is to a large extent the result of correlations with the indicator component referring to the regulation of temporary work agency employment. The most relevant features of fixed-term contract regulation behave broadly as expected. The indicator component relating to the valid cases for the use of fixed-term contracts is negatively correlated with the wage premium. The component summarising the maximum cumulative duration of fixed-term contracts is negatively related with the wage premium of old workers.

The share of permanent contracts is positively correlated with the wage premium. This relation may reflect higher bargaining power by permanent workers in countries with a large pool of temporary labour, which would be dismissed first in response to an increase in labour costs, thereby shielding permanent workers against the risk of unemployment (e.g., Bentolia and Dolado, 1994). An alternative interpretation of this correlation could run in the opposite direction: in the presence of a high wage gap, employers would have the incentive to hire temporary labour as a substitute for wage adjustment during downturns.

Turning to unemployment benefits, there is an expected positive correlation between the wage premium and the maximum duration of unemployment insurance. Such correlation is high and significant for older workers. This appears consistent with the fact that the length of unemployment insurance entitlements is often linked to seniority, so that the protection against loss of income during unemployment is generally more generous for older workers. Regarding net replacement rates, they are positively correlated as expected. The correlation is positive for older workers. It is also higher and more significant when considering replacement rates after relatively long unemployment spells.

As expected, the permanent contract wage premium is negatively correlated with the ratio of the minimum to the median wage: higher wage floors reduce the extent to which permanent workers can command higher wages as compared with temporary workers of similar type. The relation is strong and significant for young workers, which are more likely to have their actual wages bound by minimum wages. Correlation between wage premia and other characteristics of the wage setting system are instead less strong and clear cut, but it is confirmed that indicators likely to capture the size or pervasiveness of wage floors such as

union density or collective bargaining coverage are negatively related to the wage premium of young workers, which are more likely to have their actual wages close to collectively bargained wage floors.

6.   CONCLUDING REMARKS

In this paper we analysed wage differences between permanent and fixed-term contracts across 26 EU countries. Individual characteristics explain a large part of the observed wage gap between fixed-term and permanent contracts. However, a substantial fraction of the gap remained unexplained, resulting in an average wage premium between fixed-term and permanent contracts of about 15%.

The wage premium for permanent contracts persists when estimated separately by age groups, education groups, gender and occupation. Individuals with low age and education, and performing elementary tasks receive a lower premium, as well as women. The size of the premium varies substantially across countries, with the largest wage premia being recorded in some Continental countries and some Central and Eastern European countries. The correlation of the wage premium with indicators of labour market institutions suggests that the premium is higher in countries with higher EPL, with a high share of temporary workers, and with a high maximum duration of unemployment benefits. Minimum wage also seems to play a role, by reducing the wage premium among the young and low educated groups.

Overall, the results are consistent with the view that the emergence of the permanent wage premium is consistent with the fact that temporary contracts are used as a screening device for new recruits, since a high permanent contract wage premium is observed especially among prime-age and senior workers, which are more likely to benefit from higher seniority premia than newly-recruited peers on temporary contracts. Several pieces of evidence are supportive of the view that the permanent contract wage premium can be the result of higher bargaining power enjoyed by permanent workers. The premium is indeed lower for the most substitutable workers such as the low skilled and those performing elementary tasks. Moreover, countries with labour market institutions likely to strengthen the protection of temporary workers, notably EPL, tend to be characterised in general by a higher permanent contract wage premium.

The above results have a number of implications for policy and open the avenue for further analytical work.

First, the debate on labour market segmentation between fixed-term and permanent contracts has focused on the issue of precariousness. The present study corroborates findings in previous analyses that the problem is also one of wage premia not justified by skill or productivity differences. These premia are non-negligible and quite pervasive, they add to the fairness and equity implications of labour market segmentation and, to the extent they entail a distortion in resource allocation, imply an efficiency loss.

Second, the analysis on the available cross-section of wage premia estimates is suggestive that labour market institutions, notably EPL, play a role. Further work should investigate the link between labour market institutions and wage premia more systematically, ideally exploiting a panel structure for the data, with a view to strengthen the basis for possible policy recommendations.

Third, the evidence provided in this paper indicates not only that low education workers benefit from a lower permanent contract wage premium but also that the education wage premium is higher for permanent workers. This finding suggests that temporary workers suffer not only from precariousness and a negative wage gap, but also from lower incentives to accumulate skills.

Finally, wage premia in the cross section appear to be quite correlated with the share of temporary contracts. Further analysis should investigate the extent to which such correlation is mostly the result of stronger bargaining power on the part of permanent workers in countries where a large pool of temporary labour shields permanent workers from the risk of dismissal or whether instead this relation reflects the fact that, in countries with a high wage gap for permanent contracts, employers hire more intensively temporary labour as a substitute for wage adjustment. Such an analysis would be relevant for policy, notably to shed light on the extent to which segmentation could become a self-sustaining feature of the economy, with the presence of a wage gap providing the basis for a wider use of temporary labour, which in turn helps keeping the wage gap high and reduces the incentives to wage adjustment.

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Figure 1: Hourly earnings of fixed-term and permanent contracts
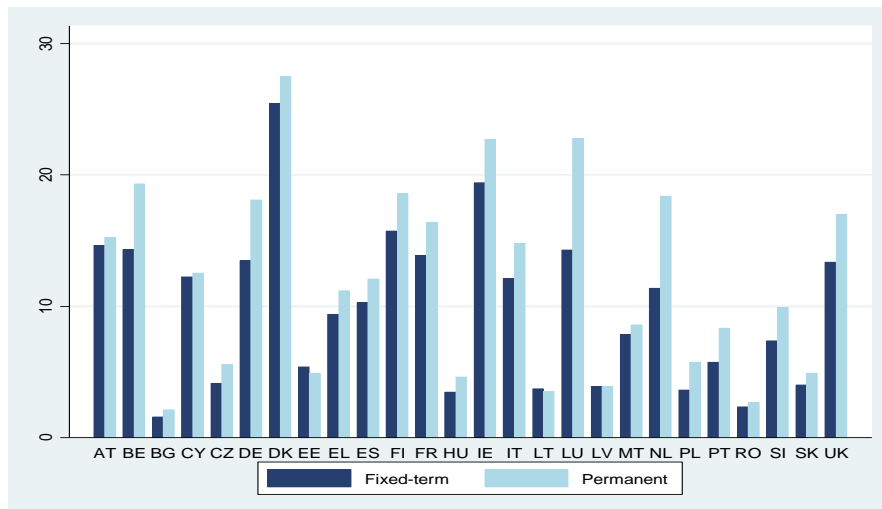
Figure 2: Average difference in earnings by type of contract by individual characteristics (% of hourly earnings in relation to fixed-term contracts)

Figure 3: Proportion of fixed-term contracts
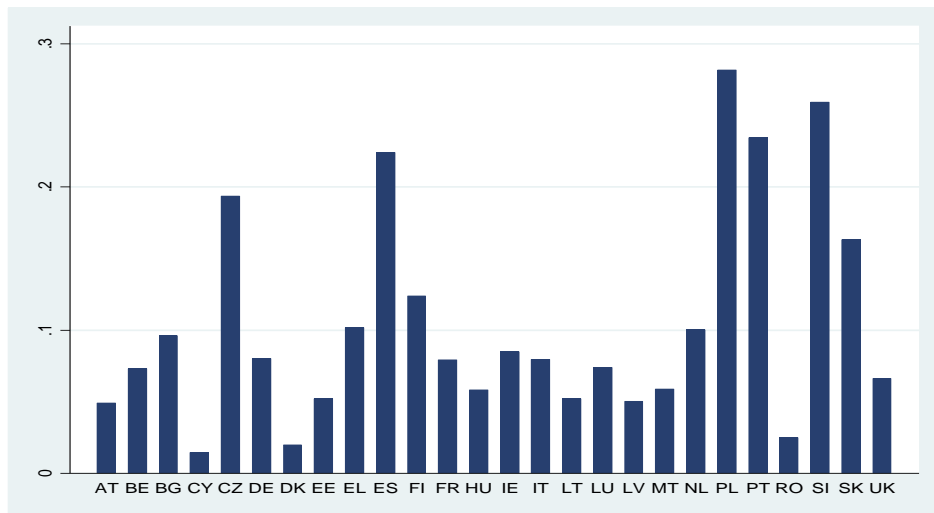
Figure 4: Proportion of fixed-term contracts by individual characteristics
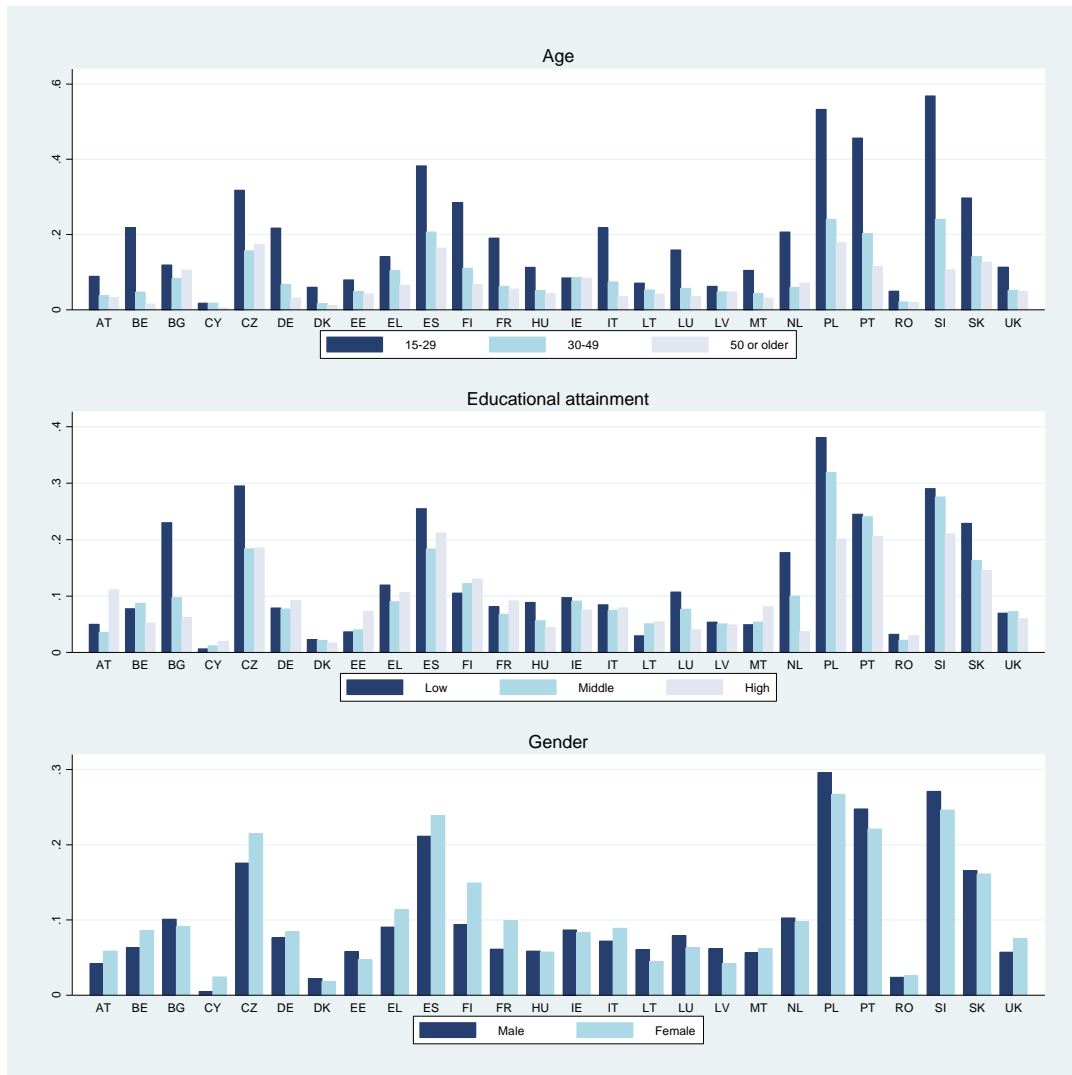
Table 1: Mincerian regression, estimates with pooled observations across countries

Explanatory variables	Coefficient	Standard error
Type of contract		
Permanent	0.139**	0.0077
Age		
30-49	0.203**	0.0085
50 +	0.261**	0.0093
Education		
Secondary	0.111**	0.0082
Tertiary	0.273**	0.0138
Gender		
Female	-0.176**	0.0079
Activity sector		
Trade, transport and accommodation	-0.086**	0.0112
Industry	0.044**	0.0085
Ownership		
Public	0.043**	0.0107
ISCO		
Plant and machine operators	0.120**	0.0156
Craft and related trades	0.140**	0.0154
Skilled agriculture, forestry and fishery	-0.039*	0.0166
Service and sales	0.124**	0.0180
Clerical support	0.217**	0.0160
Technicians and associate professionals	0.411**	0.0177
Professionals	0.618**	0.0223
Managers	0.864**	0.0242
Country dummies	yes	
Constant	2.075**	0.0160
N. Obs.	26240	
R2	94,10%	

Note: ** $p<0.01$, * $p<0.05$, + $p<0.1$. Standard errors are heteroskedasticity robust. Estimation method: OLS with country specific effects. Omitted categories: age: 15-29; education: primary education; activity sector: other service activities; ownership: private sector; occupation (ISCO): elementary occupations.

Figure 5: Permanent contract wage premium
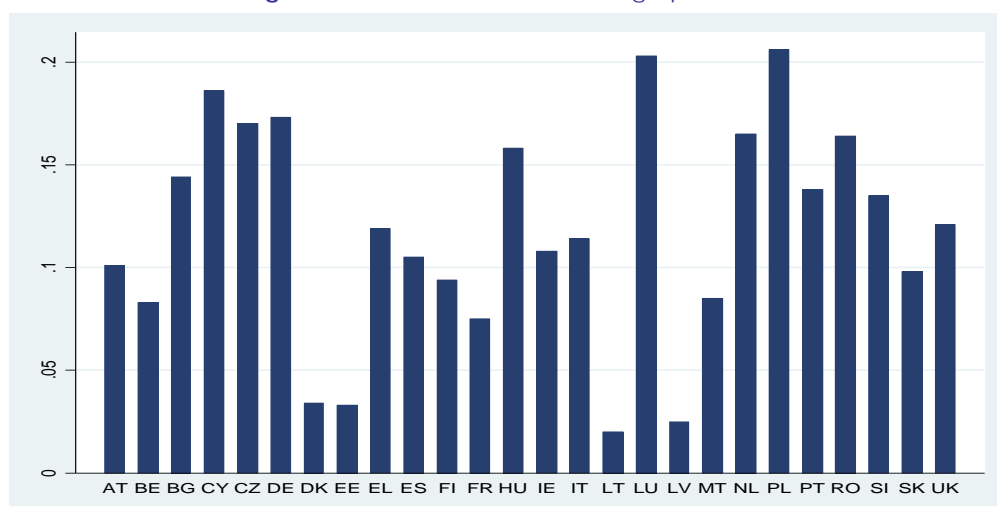
Note: Detailed estimation results presented in Table 1A.

Table 2: Permanent contract wage premium: Oaxaca-Blinder decomposition

	Difference	Explained	Unexplained
Pooled	0.406**	0.268**	0.139**
AT	0.071*	-0.030	0.101**
BE	0.276**	0.194**	0.083**
BG	0.291**	0.146**	0.144**
CY	0.001	-0.185+	0.186**
CZ	0.282**	0.111**	0.170**
DE	0.286**	0.113**	0.173**
DK	0.100**	0.066**	0.034**
EE	-0.068+	-0.100**	0.033*
EL	0.167**	0.048	0.119**
ES	0.161**	0.056**	0.105**
FI	0.165**	0.071**	0.094**
FR	0.165**	0.090**	0.075**
HU	0.268**	0.111**	0.158**
IE	0.151**	0.044+	0.108**
IT	0.208**	0.093**	0.114**
LT	-0.017	-0.037	0.020
LU	0.404**	0.202**	0.203**
LV	0.027	0.002	0.025+
MT	0.100*	0.016	0.085**
NL	0.452**	0.287**	0.165**
PL	0.426**	0.220**	0.206**
PT	0.304**	0.166**	0.138**
RO	0.213**	0.049	0.164**
SI	0.274**	0.140**	0.135**
SK	0.199**	0.101**	0.098**
UK	0.235**	0.114**	0.121**

Note: ** p<0.01, * p<0.05, + p<0.1.

Table 3: Permanent contract wage premium: estimation results by age group

	15-29		30-49		50+	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Pooled	0.101**	0.0107	0.163**	0.0115	0.144**	0.0133
AT	0.050*	0.0213	0.113**	0.0209	0.136**	0.0444
BE	0.063**	0.0145	0.117**	0.0137	0.162**	0.0233
BG	0.087**	0.0309	0.159**	0.0341	0.132**	0.028
CY	-0.161+	0.095	0.248**	0.0813	0.405**	0.0858
CZ	0.165**	0.0164	0.184**	0.0189	0.151**	0.0175
DE	0.076**	0.0189	0.208**	0.0231	0.286**	0.0297
DK	0.043*	0.0217	0.038*	0.0171	0.000	0.0236
EE	0.067+	0.037	0.026	0.0361	0.004	0.03
EL	0.029	0.0242	0.138**	0.0321	0.124**	0.0386
ES	0.077**	0.0137	0.158**	0.0142	-0.019	0.0278
FI	0.084**	0.0116	0.101**	0.0128	0.086**	0.0181
FR	0.095**	0.0294	0.068*	0.0286	0.086**	0.0231
HU	0.143**	0.0251	0.176**	0.0276	0.123**	0.0322
IE	0.045	0.0277	0.107**	0.0217	0.139**	0.0261
IT	0.047*	0.0186	0.118**	0.0252	0.168**	0.0393
LT	0.055	0.0422	0.016	0.0572	-0.018	0.0596
LU	0.128**	0.0197	0.260**	0.0259	0.311**	0.0599
LV	0.004	0.0473	0.051+	0.0303	-0.003	0.0378
MT	0.099**	0.0239	0.074+	0.0429	0.055	0.0428
NL	0.077**	0.018	0.222**	0.0186	0.243**	0.0235
PL	0.158**	0.0229	0.226**	0.022	0.229**	0.0227
PT	0.053*	0.0213	0.171**	0.0212	0.172**	0.0345
RO	0.113	0.075	0.172**	0.0621	0.190**	0.0591
SI	0.127**	0.0143	0.139**	0.013	0.126**	0.0217
SK	0.134**	0.0164	0.103**	0.0197	0.050**	0.0168
UK	0.124**	0.0201	0.156**	0.0386	0.075*	0.0299

Note: ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$. Standard errors are heteroskedasticity robust.

Table 4: Permanent contract wage premium: estimation results by education group

	Low		Middle		High	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Pooled	0.086**	0.0087	0.148**	0.009	0.140**	0.0156
AT	0.072**	0.0212	0.111**	0.0231	0.092*	0.0355
BE	0.070**	0.0162	0.099**	0.0176	0.087*	0.035
BG	0.167**	0.042	0.104**	0.0244	0.195**	0.0336
CY	0.353*	0.1749	0.217*	0.0874	0.107	0.0981
CZ	0.143**	0.0136	0.159**	0.0132	0.178**	0.019
DE	0.089**	0.0184	0.185**	0.021	0.082**	0.0255
DK	0.055**	0.0162	0.051*	0.0204	-0.000	0.0226
EE	0.053	0.0419	0.049	0.0332	0.016	0.0319
EL	0.088**	0.0261	0.117**	0.0336	0.111*	0.0488
ES	0.060**	0.016	0.122**	0.0234	0.136**	0.021
FI	0.116**	0.0176	0.105**	0.0123	0.075**	0.0135
FR	0.086**	0.0213	0.069**	0.0168	0.074+	0.0376
HU	0.079**	0.0235	0.195**	0.0212	0.073+	0.0409
IE	0.072**	0.0249	0.113**	0.0233	0.111**	0.0254
IT	0.073**	0.0207	0.140**	0.0294	0.109*	0.0521
LT	0.091	0.0819	0.084*	0.0413	-0.014	0.0478
LU	0.140**	0.0259	0.225**	0.0307	0.302**	0.0505
LV	0.086+	0.0458	0.061+	0.032	-0.031	0.0266
MT	0.047	0.0314	0.140**	0.0413	0.099**	0.0372
NL	0.135**	0.0229	0.163**	0.0207	0.278**	0.0261
PL	0.165**	0.0146	0.198**	0.0139	0.217**	0.0366
PT	0.078**	0.0183	0.190**	0.0384	0.215**	0.02
RO	0.178**	0.0448	0.064	0.0415	0.238**	0.0652
SI	0.111**	0.0128	0.134**	0.0134	0.138**	0.0186
SK	0.030+	0.0172	0.097**	0.0143	0.086**	0.0223
UK	0.101**	0.0258	0.154**	0.036	0.096**	0.026

Note: ** p<0.01, * p<0.05, + p<0.1. Standard errors are heteroskedasticity robust.

Table 5: Permanent contract wage premium: estimation results by gender

	Female		Male	
	Coefficient	Standard error	Coefficient	Standard error
Pooled	0.115**	0.0116	0.162**	0.0095
AT	0.084**	0.0174	0.121**	0.0273
BE	0.076**	0.0195	0.099**	0.0185
BG	0.129**	0.0225	0.147**	0.0264
CY	0.168*	0.0794	0.174*	0.0695
CZ	0.147**	0.013	0.192**	0.0181
DE	0.143**	0.0185	0.194**	0.0246
DK	0.015	0.0149	0.043+	0.0224
EE	0.064*	0.0249	0.003	0.0377
EL	0.089**	0.0329	0.159**	0.0246
ES	0.106**	0.0157	0.109**	0.0164
FI	0.076**	0.0097	0.130**	0.0151
FR	0.072**	0.0247	0.076*	0.0347
HU	0.124**	0.0233	0.185**	0.023
IE	0.121**	0.0193	0.097**	0.0234
IT	0.086**	0.0251	0.148**	0.0214
LT	-0.032	0.0511	0.094*	0.0471
LU	0.171**	0.0362	0.221**	0.028
LV	-0.043	0.0288	0.090**	0.0298
MT	0.083**	0.0268	0.081**	0.029
NL	0.116**	0.0193	0.195**	0.0216
PL	0.168**	0.023	0.228**	0.0172
PT	0.103**	0.0257	0.174**	0.0215
RO	0.170*	0.0681	0.154**	0.0509
SI	0.106**	0.0143	0.159**	0.0129
SK	0.095**	0.0126	0.094**	0.0203
UK	0.068*	0.0274	0.191**	0.0227

Note: ** $p<0.01$, * $p<0.05$, + $p<0.1$. Standard errors are heteroskedasticity robust.
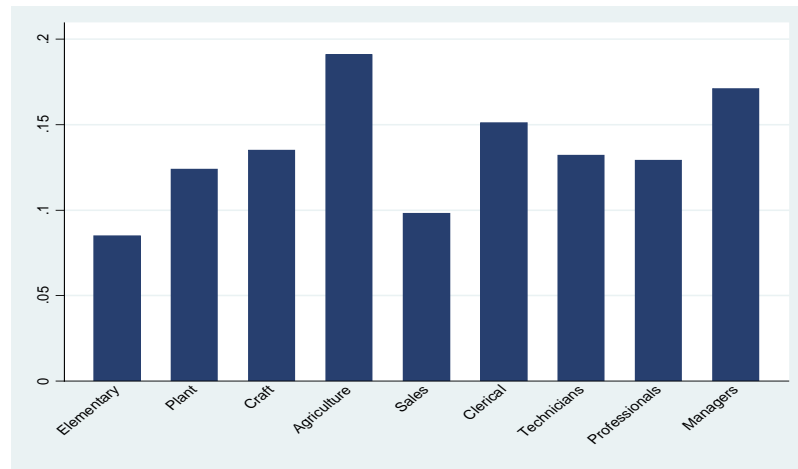
Note: Detailed estimation results presented in Table 2A.

Table 6: Cross-country rank correlation between permanent contract wage premia and selected labour market institutions

	Wage premium			N.
	Total	Young	50+	Obs.
Employment Protection Legislation (EPL)				
EPL of regular contracts	0.1455	-0.2410	0.4612*	21
EPL of temporary contracts	0.0026	0.1158	0.0699	21
EPL - selected components				
Notice period plus severance payments, 9 months of tenure	-0.1160	0.1520	-0.1141	21
Notice period plus severance payments, 4 years of tenure	-0.0113	0.2634	-0.1630	21
Notice period plus severance payments, 20 years of tenure	0.2364	0.0456	0.1744	21
Legal definition of fair dismissal	0.0202	0.0077	0.1269	21
Possibility of reinstatement	0.1117	0.0010	0.0738	21
Valid cases for use fixed-term contracts	-0.3521	-0.3207	-0.2353	21
Maximum cumulative duration for fixed-term contracts	0.0007	0.0537	-0.1082	21
Share of temporary contracts	0.3376+	-0.0575	0.3041	26
Unemployment benefits				
Maximum unemployment benefits duration	0.2416	-0.2673	0.4950*	24
Net replacement rates at 2 months (single; average earner)	0.0962	0.0144	0.1842	25
Net replacement rates at 7 months (single; average earner)	0.1737	-0.1723	0.3786+	25
Net replacement rates at 13 months (single; average earner)	-0.1851	-0.3751+	-0.0053	25
Net replacement rates at 25 months (single; average earner)	-0.1683	-0.2355	0.1647	25
Collective bargaining characteristics and wage premium				
Minimum wage relative to median wage	-0.2974	-0.4442+	-0.0052	18
Union density	0.0462	-0.2578	0.3105	26
Coordination	0.0866	-0.2702	0.2339	26
Coverage	-0.0478	-0.1836	0.2361	25

Note: ** $p<0.01$, * $p<0.05$, + $p<0.1$.

Source: OECD (EPL, unemployment benefits and minimum wage relative to median wage) and ICTWSS – Jelle Visser (union density, coordination and coverage).

APPENDIX

Table 1A: Estimation results at country level

	AT	BE	BG	CY	CZ	DE	DK	EE	ES
Contract	0.101**	0.083**	0.144**	0.186**	0.170**	0.173**	0.034*	0.033	0.105**
	[0.0169]	[0.0145]	[0.0224]	[0.0711]	[0.0124]	[0.0161]	[0.0137]	[0.0231]	[0.0126]
Age [30-49]	0.203**	0.196**	0.054+	0.295**	0.134**	0.221**	0.219**	0.059**	0.146**
	[0.0155]	[0.0150]	[0.0295]	[0.0288]	[0.0163]	[0.0168]	[0.0143]	[0.0178]	[0.0137]
Age [50 +]	0.288**	0.319**	0.027	0.443**	0.119**	0.272**	0.275**	-0.047**	0.293**
	[0.0196]	[0.0187]	[0.0306]	[0.0314]	[0.0164]	[0.0202]	[0.0162]	[0.0172]	[0.0191]
Secondary	0.107**	0.081**	0.033	0.052+	0.106**	0.230**	0.072**	0.075**	0.093**
	[0.0130]	[0.0124]	[0.0265]	[0.0289]	[0.0138]	[0.0216]	[0.0110]	[0.0154]	[0.0135]
Tertiary	0.249**	0.271**	0.250**	0.250**	0.374**	0.549**	0.166**	0.244**	0.168**
	[0.0173]	[0.0170]	[0.0310]	[0.0414]	[0.0245]	[0.0322]	[0.0126]	[0.0225]	[0.0134]
Gender	-0.186**	-0.109**	-0.179**	-0.198**	-0.205**	-0.171**	-0.144**	-0.273**	-0.179**
	[0.0125]	[0.0106]	[0.0263]	[0.0235]	[0.0155]	[0.0176]	[0.0131]	[0.0170]	[0.0121]
Trade	-0.035*	-0.060**	-0.025	-0.171**	-0.044	0.017	-0.098**	-0.063**	-0.053**
	[0.0143]	[0.0119]	[0.0419]	[0.0277]	[0.0273]	[0.0200]	[0.0146]	[0.0238]	[0.0162]
Industry	0.113**	0.061**	-0.030	-0.077**	-0.009	0.177**	0.002	-0.016	0.045**
	[0.0177]	[0.0127]	[0.0387]	[0.0278]	[0.0247]	[0.0185]	[0.0155]	[0.0227]	[0.0124]
Ownership	0.066**	0.117**	-0.093+	0.209**	-0.048+	0.096**	-0.139**	-0.151**	0.151**
	[0.0187]	[0.0191]	[0.0491]	[0.0298]	[0.0254]	[0.0239]	[0.0143]	[0.0263]	[0.0167]
Plant	0.145**	0.091**	0.274**	0.139**	0.169**	0.003	0.070**	0.292**	0.136**
	[0.0342]	[0.0215]	[0.0370]	[0.0485]	[0.0222]	[0.0398]	[0.0197]	[0.0305]	[0.0219]
Craft	0.196**	0.067**	0.321**	0.261**	0.175**	0.059*	0.089**	0.336**	0.132**
	[0.0191]	[0.0208]	[0.0395]	[0.0334]	[0.0187]	[0.0297]	[0.0251]	[0.0246]	[0.0200]
Agriculture			-0.103+	0.018	0.071*	-0.080**	0.048*	0.508*	-0.040
			[0.0586]	[0.0735]	[0.0348]	[0.0306]	[0.0202]	[0.1979]	[0.0297]
Service	0.167**	0.120**	0.029	0.112**	0.080**	0.008	0.094**	0.158**	0.110**
	[0.0162]	[0.0211]	[0.0349]	[0.0327]	[0.0292]	[0.0319]	[0.0172]	[0.0253]	[0.0241]
Clerical	0.379**	0.148**	0.377**	0.253**	0.355**	0.144**	0.147**	0.402**	0.172**
	[0.0233]	[0.0229]	[0.0292]	[0.0415]	[0.0178]	[0.0326]	[0.0131]	[0.0284]	[0.0215]
Technical	0.521**	0.245**	0.638**	0.527**	0.511**	0.391**	0.270**	0.625**	0.364**
	[0.0201]	[0.0239]	[0.0309]	[0.0368]	[0.0178]	[0.0305]	[0.0126]	[0.0204]	[0.0204]
Professionals	0.649**	0.424**	0.715**	0.661**	0.558**	0.380**	0.332**	0.788**	0.581**
	[0.0222]	[0.0279]	[0.0519]	[0.0495]	[0.0286]	[0.0388]	[0.0181]	[0.0334]	[0.0252]
Managers	0.987**	0.729**	1.101**	1.120**	0.913**	0.656**	0.575**	1.058**	0.905**
	[0.0292]	[0.0356]	[0.0571]	[0.0480]	[0.0403]	[0.0801]	[0.0236]	[0.0338]	[0.0265]
Constant	2.009**	2.329**	0.104*	1.588**	0.992**	2.023**	2.872**	1.089**	1.867**
	[0.0242]	[0.0231]	[0.0490]	[0.0875]	[0.0258]	[0.0282]	[0.0220]	[0.0348]	[0.0221]
N. Obs.	883	667	1,031	462	1,652	1,405	1,461	785	1,218
R2	0.917	0.938	0.819	0.917	0.871	0.876	0.892	0.904	0.890

Note: ** p<0.01, * p<0.05, + p<0.1. Heteroskedasticity-robust standard errors are in square brackets.

	FI	FR	EL	HU	IE	IT	LT	LU	LV
Contract	0.094**	0.075**	0.119**	0.158**	0.108**	0.114**	0.020	0.203**	0.025
	[0.0096]	[0.0223]	[0.0238]	[0.0178]	[0.0159]	[0.0170]	[0.0356]	[0.0241]	[0.0227]
Age [30-49]	0.123**	0.168**	0.265**	0.126**	0.249**	0.186**	0.061*	0.227**	0.036+
	[0.0100]	[0.0164]	[0.0198]	[0.0242]	[0.0229]	[0.0165]	[0.0285]	[0.0221]	[0.0193]
Age [50 +]	0.164**	0.289**	0.470**	0.175**	0.331**	0.317**	0.031	0.340**	-0.008
	[0.0110]	[0.0194]	[0.0273]	[0.0216]	[0.0270]	[0.0214]	[0.0304]	[0.0270]	[0.0179]
Secondary	0.035**	0.047**	0.072**	0.123**	0.105**	0.132**	-0.008	0.090**	0.054**
	[0.0108]	[0.0120]	[0.0196]	[0.0220]	[0.0164]	[0.0134]	[0.0300]	[0.0187]	[0.0175]
Tertiary	0.137**	0.165**	0.173**	0.575**	0.262**	0.284**	0.240**	0.181**	0.337**
	[0.0132]	[0.0133]	[0.0244]	[0.0367]	[0.0197]	[0.0211]	[0.0350]	[0.0280]	[0.0243]
Gender	-0.155**	-0.132**	-0.133**	-0.179**	-0.172**	-0.165**	-0.206**	-0.092**	-0.209**
	[0.0077]	[0.0117]	[0.0157]	[0.0247]	[0.0167]	[0.0154]	[0.0211]	[0.0180]	[0.0171]
Trade	-0.010	-0.037**	-0.086**	-0.085**	-0.171**	-0.042*	-0.014	-0.188**	-0.065*
	[0.0113]	[0.0132]	[0.0202]	[0.0316]	[0.0237]	[0.0178]	[0.0400]	[0.0233]	[0.0285]
Industry	0.030**	0.034**	0.017	-0.002	-0.005	0.040*	0.071+	-0.073**	-0.087**
	[0.0094]	[0.0125]	[0.0222]	[0.0272]	[0.0224]	[0.0183]	[0.0383]	[0.0208]	[0.0289]
Ownership	-0.069**	-0.042**	0.082**	-0.163**	0.212**	0.103**	0.046	0.204**	-0.075**
	[0.0080]	[0.0144]	[0.0283]	[0.0311]	[0.0183]	[0.0204]	[0.0305]	[0.0242]	[0.0274]
Plant	0.181**	0.100**	0.202**	0.262**	0.097**	0.141**	0.317**	0.089*	0.287**
	[0.0140]	[0.0215]	[0.0275]	[0.0467]	[0.0282]	[0.0226]	[0.0603]	[0.0380]	[0.0444]
Craft	0.143**	0.113**	0.223**	0.205**	0.195**	0.063*	0.277**	0.138**	0.261**
	[0.0135]	[0.0174]	[0.0370]	[0.0291]	[0.0286]	[0.0315]	[0.0387]	[0.0273]	[0.0264]
Agriculture	-0.016	-0.032		0.002	-0.029	-0.020		-0.011	0.248**
	[0.0222]	[0.0269]		[0.0350]	[0.0563]	[0.0400]		[0.0430]	[0.0678]
Service	0.113**	0.173**	0.113**	0.187**	0.092**	0.136**	0.165**	0.137**	0.094**
	[0.0136]	[0.0192]	[0.0233]	[0.0293]	[0.0232]	[0.0235]	[0.0407]	[0.0319]	[0.0225]
Clerical	0.152**	0.154**	0.220**	0.410**	0.153**	0.248**	0.334**	0.348**	0.331**
	[0.0126]	[0.0175]	[0.0265]	[0.0272]	[0.0235]	[0.0243]	[0.0401]	[0.0293]	[0.0236]
Technical	0.295**	0.370**	0.268**	0.511**	0.312**	0.383**	0.499**	0.507**	0.472**
	[0.0131]	[0.0149]	[0.0311]	[0.0285]	[0.0231]	[0.0247]	[0.0360]	[0.0403]	[0.0269]
Professionals	0.521**	0.607**	0.489**	0.530**	0.567**	0.695**	0.737**	0.616**	0.616**
	[0.0139]	[0.0234]	[0.0344]	[0.0535]	[0.0290]	[0.0283]	[0.0405]	[0.0400]	[0.0295]
Managers	0.853**	0.845**	0.744**	0.931**	0.635**	1.051**	0.937**	1.071**	0.820**
	[0.0249]	[0.0263]	[0.0659]	[0.0470]	[0.0391]	[0.0454]	[0.0513]	[0.0554]	[0.0422]
Constant	2.418**	2.163**	1.648**	0.722**	2.303**	1.958**	0.611**	2.255**	0.886**
	[0.0187]	[0.0309]	[0.0314]	[0.0436]	[0.0321]	[0.0245]	[0.0520]	[0.0347]	[0.0344]
N. Obs.	1,424	1,194	652	1,228	828	978	610	401	1,107
R2	0.932	0.897	0.850	0.861	0.876	0.907	0.847	0.928	0.862

Note: ** $p<0.01$, * $p<0.05$, + $p<0.1$. Heteroskedasticity-robust standard errors are in square brackets.

Table 1A (cont.): Estimation results at country level

	MT	NL	PL	PT	RO	SI	SK	UK
Contract	0.085**	0.165**	0.206**	0.138**	0.164**	0.135**	0.098**	0.121**
	[0.0206]	[0.0162]	[0.0157]	[0.0177]	[0.0458]	[0.0108]	[0.0132]	[0.0196]
Age [30-49]	0.156**	0.309**	0.161**	0.189**	0.087*	0.155**	0.114**	0.278**
	[0.0177]	[0.0162]	[0.0222]	[0.0202]	[0.0359]	[0.0147]	[0.0167]	[0.0254]
Age [50 +]	0.153**	0.378**	0.158**	0.352**	0.107**	0.218**	0.097**	0.242**
	[0.0240]	[0.0175]	[0.0248]	[0.0307]	[0.0366]	[0.0185]	[0.0161]	[0.0194]
Secondary	0.154**	0.139**	0.047**	0.193**	0.063*	0.122**	0.159**	0.047*
	[0.0196]	[0.0143]	[0.0161]	[0.0194]	[0.0288]	[0.0114]	[0.0156]	[0.0217]
Tertiary	0.289**	0.327**	0.367**	0.483**	0.368**	0.400**	0.441**	0.132**
	[0.0249]	[0.0163]	[0.0285]	[0.0241]	[0.0388]	[0.0163]	[0.0227]	[0.0157]
Gender	-0.090**	-0.134**	-0.185**	-0.237**	-0.130**	-0.128**	-0.231**	-0.194**
	[0.0167]	[0.0115]	[0.0208]	[0.0177]	[0.0303]	[0.0127]	[0.0159]	[0.0195]
Trade	-0.138**	-0.135**	0.021	-0.088**	0.004	-0.016	-0.023	-0.277**
	[0.0246]	[0.0182]	[0.0281]	[0.0222]	[0.0454]	[0.0206]	[0.0227]	[0.0377]
Industry	-0.012	0.034**	0.057*	-0.126**	0.088+	-0.012	0.041*	-0.063*
	[0.0185]	[0.0112]	[0.0240]	[0.0196]	[0.0463]	[0.0131]	[0.0191]	[0.0262]
Ownership	-0.011	-0.003	0.065*	0.119**	-0.046	0.054**	-0.101**	-0.013
	[0.0208]	[0.0132]	[0.0278]	[0.0256]	[0.0595]	[0.0154]	[0.0212]	[0.0320]
Plant	0.168**	0.122**	0.235**	0.109**	0.414**	0.120**	0.147**	0.115**
	[0.0295]	[0.0282]	[0.0285]	[0.0356]	[0.0484]	[0.0174]	[0.0201]	[0.0226]
Craft	0.210**	0.193**	0.161**	0.123**	0.394**	0.117**	0.165**	0.330**
	[0.0313]	[0.0256]	[0.0282]	[0.0279]	[0.0398]	[0.0164]	[0.0200]	[0.0290]
Agriculture	0.064*	0.014	-0.035	-0.102+	-0.024	-0.014	0.058	-0.038
	[0.0274]	[0.0263]	[0.0326]	[0.0590]	[0.0457]	[0.0352]	[0.0352]	[0.0285]
Service	0.110**	0.182**	0.072*	0.131**	0.082*	0.126**	0.104**	0.223**
	[0.0349]	[0.0289]	[0.0341]	[0.0313]	[0.0355]	[0.0271]	[0.0266]	[0.0467]
Clerical	0.180**	0.215**	0.267**	0.299**	0.531**	0.235**	0.324**	0.243**
	[0.0270]	[0.0224]	[0.0283]	[0.0290]	[0.0320]	[0.0200]	[0.0189]	[0.0221]
Technical	0.297**	0.350**	0.385**	0.538**	0.657**	0.396**	0.503**	0.487**
	[0.0260]	[0.0246]	[0.0275]	[0.0317]	[0.0283]	[0.0165]	[0.0163]	[0.0258]
Professionals	0.478**	0.428**	0.656**	0.643**	0.773**	0.579**	0.519**	0.812**
	[0.0330]	[0.0261]	[0.0379]	[0.0329]	[0.0469]	[0.0212]	[0.0272]	[0.0245]
Managers	0.692**	0.615**	0.896**	1.130**	1.282**	0.940**	0.943**	0.959**
	[0.0358]	[0.0317]	[0.0461]	[0.0439]	[0.0536]	[0.0261]	[0.0364]	[0.0374]
Constant	1.588**	2.057**	0.777**	1.273**	0.034	1.464**	0.915**	2.027**
	[0.0312]	[0.0249]	[0.0371]	[0.0344]	[0.0638]	[0.0218]	[0.0238]	[0.0308]
N. Obs.	415	1,104	1,404	926	823	1,204	1,334	1,044
R2	0.871	0.926	0.898	0.919	0.849	0.925	0.886	0.877

Note: ** p<0.01, * p<0.05, + p<0.1. Heteroskedasticity-robust standard errors are in square brackets.

Table 2A: Permanent contract wage premium: estimation results by occupation group

	Elementary	Plant	Craft	Agriculture	Sales	Clerical	Technician	Professionals	Managers
EU	0.085**	0.124**	0.135**	0.191**	0.098**	0.151**	0.132**	0.129**	0.171**
AT	0.081**	0.097**	0.104**	:	0.114**	0.164**	-0.051	0.128**	-0.261*
BE	0.036**	0.077**	0.080**	:	0.105**	0.103**	0.142**	0.071	0.377**
BG	0.167**	0.009	0.016	:	0.149**	0.198**	0.177**	0.205**	0.057
CY	0.107	:	0.715**	:	0.282+	0.167	0.463**	0.103	:
CZ	0.164**	0.161**	0.156**	0.209**	0.129**	0.168**	0.181**	0.147**	0.156**
DE	0.140**	0.177**	0.192**	0.321**	0.170**	0.189**	0.169**	0.089*	0.047
DK	0.048**	0.116**	0.050**	0.220**	-0.024	0.083**	0.060**	-0.015	-0.216**
EE	0.131**	0.096**	-0.092*	:	0.126**	0.114+	0.064*	0.034	-0.293**
ES	0.049**	0.018	0.092**	0.008	0.104**	0.147**	0.085*	0.120**	0.105
FI	0.120**	0.076**	0.124**	0.302**	0.080**	0.118**	0.105**	0.067**	-0.018
FR	0.033	-0.006	0.056	0.076	0.073**	0.010	0.051	0.126**	0.113+
GR	0.075**	0.152*	0.183**	:	0.040	0.159**	0.137*	0.116*	-0.587**
HU	0.068**	0.156**	0.175**	0.031	0.052+	0.141**	0.241**	0.090+	-0.001
IE	0.058	0.102**	0.121*	-0.045	0.058+	0.102**	0.080+	0.134**	0.152*
IT	0.047+	0.183**	0.074	0.140+	0.017	0.226**	0.074*	0.059	-0.069
LT	0.025	0.228*	0.259**	:	0.076	-0.011	0.047	-0.065	0.002
LU	0.128**	0.099*	0.203**	:	0.093+	0.191**	0.188**	0.374**	:
LV	-0.004	0.197*	0.151**	0.155	-0.046	0.108*	0.097*	-0.024	-0.109
MT	0.037	0.143	0.181*	:	0.069	0.037	0.024	0.127**	-0.173
NL	0.070	0.216**	0.157**	0.218**	0.082**	0.191**	0.191**	0.302**	0.375**
PL	0.147**	0.192**	0.164**	0.214*	0.179**	0.226**	0.262**	0.203**	0.314**
PT	0.027	0.106**	0.073**	0.218**	0.087**	0.217**	0.254**	0.202**	0.275**
RO	0.011	0.014	0.158**	0.106**	0.129+	0.010	0.173**	0.262**	0.091
SI	0.087**	0.134**	0.186**	0.016	0.097**	0.113**	0.145**	0.133**	0.014
SK	0.030*	0.108**	0.093**	0.0386	0.109**	0.123**	0.091**	0.070**	-0.068
UK	0.045*	0.205**	0.196*	:	0.087	0.136**	0.067	0.064*	0.059

Note: ** $p<0.01$, * $p<0.05$, + $p<0.1$. : data not reported or not sufficient for the estimation.

Table 3A: Pooled Mincerian regressions: estimation results by contract type

Explanatory variables	Total sample		Permanent		Fixed-term	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Type of contract						
Permanent	0.139**	0.0077				
Age						
30-49	0.203**	0.0085	0.217**	0.0098	0.127**	0.0117
50 +	0.261**	0.0093	0.274**	0.0104	0.191**	0.0156
Education						
Secondary	0.111**	0.0082	0.116**	0.0091	0.066**	0.0094
Tertiary	0.273**	0.0138	0.280**	0.0151	0.229**	0.0144
Gender						
Female	-0.176**	0.0079	-0.184**	0.0087	-0.108**	0.0106
Activity sector						
Trade, transport and accommodation	-0.086**	0.0112	-0.095**	0.0123	0.006	0.0129
Industry	0.044**	0.0085	0.040**	0.0093	0.061**	0.0108
Ownership						
Public	0.043**	0.0107	0.038**	0.0120	0.082**	0.0111
ISCO						
Plant and machine operators	0.120**	0.0156	0.122**	0.0180	0.129**	0.0144
Craft and related trades	0.140**	0.0154	0.145**	0.0176	0.121**	0.0145
Skilled agriculture, forestry and fishery	-0.039*	0.0166	-0.034+	0.0196	-0.060**	0.0200
Service and sales	0.124**	0.018	0.130**	0.0207	0.079**	0.0146
Clerical support	0.217**	0.016	0.227**	0.0182	0.146**	0.0134
Technicians and associate professionals	0.411**	0.0177	0.416**	0.0198	0.362**	0.0157
Professionals	0.618**	0.0223	0.625**	0.0249	0.558**	0.0214
Managers	0.864**	0.0242	0.868**	0.0260	0.815**	0.0291
Country dummies	yes		yes		yes	
Constant	2.075**	0.016	2.200**	0.0176	2.131**	0.0209
N. Obs.	26240		16,983		9,257	
R2	94,10%		94,10%		93%	

Note: ** p<0.01, * p<0.05, + p<0.1. Standard errors are heteroskedasticity robust.