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Institutions and inequality in the EU

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Employment protection and earnings inequality within education groups

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Context and motivations of the study

i. Earnings inequality between education and skill cohorts in Europe has been largely studied in recent years

i. However, little effort has been devoted so far to analyse the size of within groups disparities and their drivers

i. Especially under certain structural and institutional conditions which may favour incomes polarization and the persistence into low-pay traps, this dimension of inequality may be relevant.

i. In this paper we study the institutional determinants of earnings inequality within the groups of high, medium and low educated workers.

i. We employ EU-Silc microdata for western EU member countries in 2006 and 2009 to provide this evidence

(ii) Literature Review and conceptual framework of the empirical analysis

a. Freeman and Katz (1995) viewed institutions as an important explanation for the different experiences of countries in terms of wage inequality

b. Several studies published from then on have reinforced this earlier conclusion (e.g., Blau and Khan, 1996; Card, Lemieux and Riddel, 2003; Manacorda, 2004; Koeninger et al., 2007; Dustmann, Lundsteck and Schoenberg , 2009; Checchi and Garcia-Penalosa, 2010; Lemieux, 2011; OECD, 2011);

c. A higher level of Employment Protection Legislation for regular workers (EPLr), if relatively more in favour of unskilled workers (compared to skilled ones), is found to compress wages, by strengthening low skilled workers' bargaining power (Koeninger et al., 2007; Checchi and Garcia-Penalosa,2010)

d. The influence of Employment Protection Legislation for temporary workers (EPLt) has been much less studied,

e. It is plausible to think that a stringent EPLt enhances the incentives for a firm to invest in a worker and for a worker to invest in firm/sector-specific human capital. Nickell and Layard (1999) briefly describe this mechanism;

f. Regardless of education levels, a weaker EPLt could influence wage inequality within each education group of workers because it hinders accumulation of firm/sector-specific human capital and depresses wages (Arulampalam, Booth and Bryan, 2004)

g. In addition, compared to regular workers, lower levels of protection for temporary workers further reduce their bargaining power, keeping them at the bottom of the earnings distribution

Aim of the paper:

To explore the influence of Employment Protection Legislation for temporary workers (EPLt) on earnings inequality, within education levels

Research questions:

1. Does the status of temporary worker play a role in explaining inequality in different parts of the earnings distribution and in different education cohorts of workers?

2. Are the effects of EPLt heterogenous in the different education cohorts?

1. Within each cohort, is the stringency of EPLt playing a similar role in both the upper and lower tail of the distribution?

Comparative perspective for Western European Union countries before (2006) and after (2009) the outburst of the crisis

(iii) Methodology

OLS and Quantile regression to quantify the influence of Employment Protection Legislation for Temporary Workers on relative wages

The qth QR estimator β_q *minimizes over* β_q *the objective function:*

$$Q(\beta_q) = \sum_{i:y_i \geq X_i'\beta_q}^{N} q * |y_i - X_i'\beta_q| + \sum_{i:y_i < X_i'\beta_q}^{N} (1-q) * |y_i - X_i'\beta_q|$$

q is the quantile and ranges from 0 to 1. Different choices of q estimates different values of β
If q=0.9, then much more weight (90%) is placed on prediction for observation $y \geq X' \beta$
than for observations $y < X' \beta$

Quantile regression is:
1) more robust than OLS regression (in particular, it is less sensitive to the outliers)
2) Provides a potentially richer characterization of data, allowing us to study the impact of a covariate on any particular percentile of the distribution

(iii) Data and First Descriptive Evidence

- **EU Silc** dataset, reference years: 2006 and 2009
- **12 EU West** member countries (EU western members minus Malta, Cyprus, Luxembourg, Denmark and Ireland)

- **Sample**: persons at work with positive earnings, truncated at 1st and 99th percentile (95,723 in 2006 and 89,325 in 2009)

- **Earnings**: hourly gross earning in Euro PPP *(Annual earnings, n. of hours worked per week, n. of months worked per year)*

- Employees (permanent / temporary): *(Employee cash or near cash income* - PY010G*)*

- Self-employed: (*Cash Benefits and Losses from Self-Employment* - PY050G + *Value of goods produced for own consumption* - PY070G)

Employment Protection Legislation (EPL) and status in employment as key explanatory variables:

1) EPL for temporary workers as described by OECD (it includes both fixed term and temporary work agency contracts)*:*

a) Valid cases for use fixed term contracts (ftc)
b) Maximum number of ftc;
c) Maximum cumulated duration of successive ftc;
d) Types of work for which temporary work agency (twa) is legal
e) Restrictions on the number of renewals of twa contracts
f) Maximum cumulated duration of twa contracts

Countries with higher regulation show higher ratings. Outcomes are robust to the use of alternative (Fraser Institute) institutial measure of employment protection.

2) Temporary Worker status (dummy variable)

(iii) Data and First Descriptive Evidence

Other Institutional control variables have been drawn from OECD, *Fraser Institute and Visser databases*:

- **OECD EPL index for regular workers (EPLr),** is made up by 8 items among which we find notification procedures, severance payments, definition of justified or unfair dismissal, compensation after unfair dismissal

- **Business Regulation,** comes from Fraser Institute and includes Price Controls; Administrative Requirements; Bureaucracy costs; Starting a business; Extra payments / bribes / favoritism; Licensing restrictions; Cost of tax compliance; ranges from zero (highest regulation) to 10 (lowest regulation)

- **Union Density**,comes from Visser database, union membership as a proportion of employees

- **Other country-level variables: GDP growth and unemployment rate (Eurostat) and country dummies to control for residual specific characteristics**

Other control variables at individual level:

- Gender
- Age
- 2nd Job
- Sector *(Agriculture, Industry, Construction, Hotel & Rest., Trade, RE & Finance, Transports, Pers. Serv. & PA)*
- Firm Size
- Part-time status

(iii) Data and First Descriptive Evidence

Hourly earnings in Western EU countries (2006 and 2009)

Country	Obs.		Mean		Median		Theil	
	2006	*2009*	*2006*	*2009*	*2006*	*2009*	*2006*	*2009*
AT	6713	5697	14.62	15.57	12.92	13.57	0.156	0.146
BE	5468	5349	15.92	15.81	14.85	14.53	0.093	0.090
DE	10303	11345	15.52	15.11	14.27	14.15	0.147	0.145
ES	12604	11496	10.44	10.92	8.83	9.28	0.160	0.150
FI	5963	5341	12.85	14.55	11.55	12.93	0.153	0.132
FR	9099	9277	12.60	12.81	11.19	11.43	0.116	0.121
GR	5029	5377	11.06	10.96	8.49	8.88	0.240	0.223
IT	18868	16531	13.01	12.97	11.07	11.24	0.161	0.152
NL	5373	5083	20.65	21.81	18.23	19.84	0.127	0.109
PT	4026	3860	7.72	8.08	5.52	5.87	0.266	0.216
SE	3973	3657	12.16	15.50	11.85	14.19	0.125	0.124
UK	8304	6312	17.26	15.27	14.10	12.41	0.188	0.205
WEST	*95723*	*89325*	*13.61*	*13.83*	*11.74*	*12.10*	*0.161*	*0.151*

The Neterlands show the highest median hourly earnings and a very low hearnings inequality measured by Theil index; the opposite holds for Greece and Portugal.

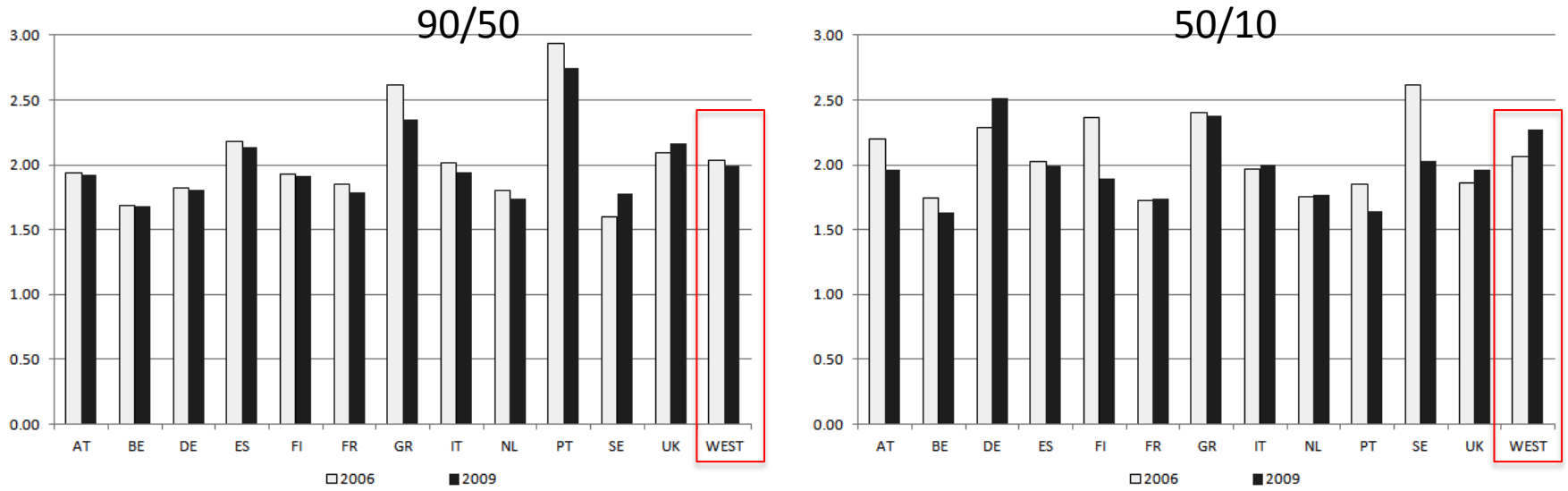
Quite stable median hourly earnings and inequality across the 2006-2009 period: only few countries respond to the crisis with a weak (Belgium and Germany) or a significant (UK) downward adjustment of median earnings whereas inequality has been stable or slightly decreasesing (exceptions are the UK and France)

(iii) Data and First Descriptive Evidence

The slight compression or stability of wage distributions across period 2006-2009 is coherent with the OECD (2011) evidence

It also means that the adjustment process has mainly taken place on the side of quantity rather than prices, given that the number of hours worked generally slowed down (-2.5% on average) and unemployment increased (+ 1.2% in the western EU area considered)

Percentile ratios of hourly earnings (2006 and 2009)



In all countries except UK and Sweden the 90/50 ratio shows a convergence of higher incomes towards the central value of the distribution

For 5 out of 12 countries, the distance between the median and the first decile either remained substantially unchanged (France and the Netherlands) or increased (Germany, UK and Italy)

The crisis has generally compressed top incomes and in some noticeable cases further pushed labour incomes at the bottom end of the ladder

(iii) Data and First Descriptive Evidence

	2006			2009		
Country	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
AT	8.68	12.84	17.89	9.47	13.49	18.49
BE	12.81	13.82	17.07	12.36	13.44	17.16
DE	10.27	13.06	16.96	7.82	12.57	17.84
ES	7.48	8.76	12.16	7.57	8.90	12.72
FI	9.65	10.36	14.82	10.88	11.47	16.25
FR	9.65	10.52	14.40	9.79	10.72	14.15
GR	6.73	8.02	14.58	6.78	8.32	13.23
IT	9.45	11.56	16.08	9.68	11.54	15.61
NL	14.64	16.92	22.75	15.79	18.25	24.59
PT	4.85	6.68	15.73	5.22	6.44	14.66
SE	10.96	11.46	12.84	12.77	13.56	15.73
UK	10.13	12.88	20.01	9.43	10.62	16.66
WEST	*8.60*	*11.71*	*16.06*	*8.73*	*11.71*	*16.12*

Higher median earnings are in all countries associated to higher education levels

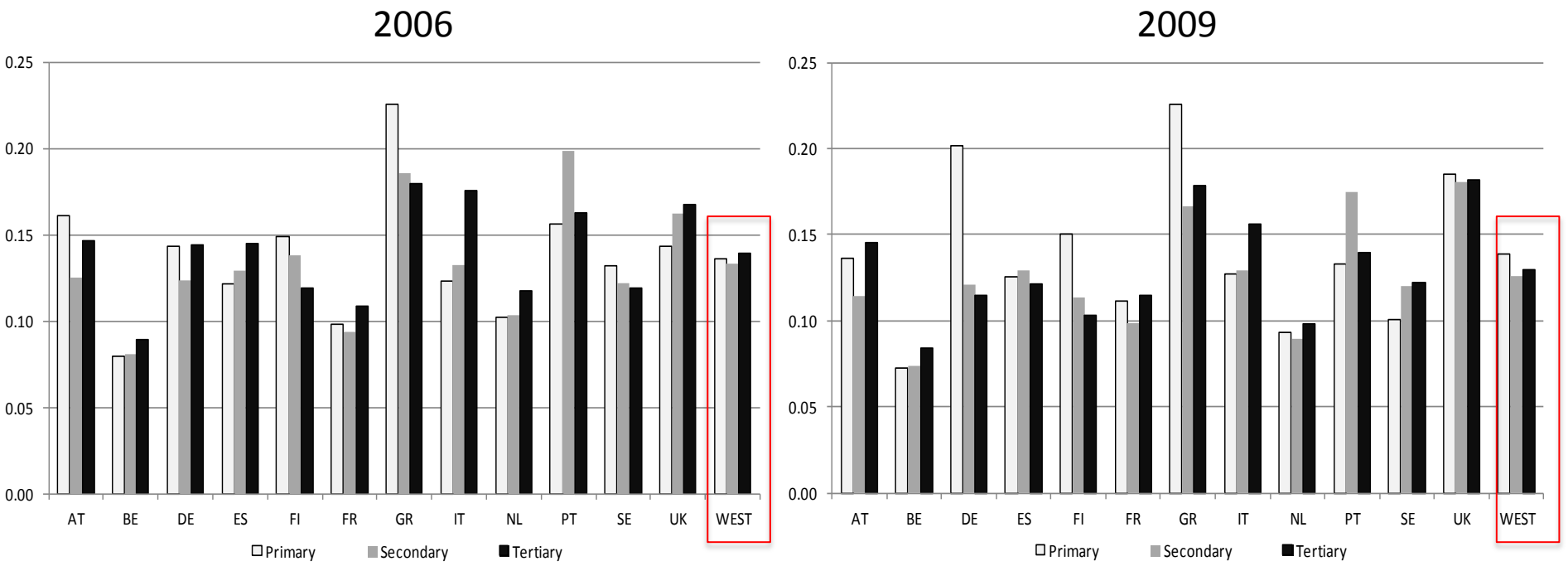
Overall, in Western EU countries the median hourly earnings for low and medium-skilled workers in 2006 are respectively the 53% and 74% of that accrued to high-skilled workers; these value are also confirmed in 2009

In Germany earnings increased for tertiary educated only, with secondary and especially primary educated workers facing an important drop; Italy is in the opposite situation

Austria, Finland, the Netherlands and Sweden show an increase in earnings in all education groups, whereas in the UK the opposite holds

(iv) Data and First Descriptive Evidence

Inequality within education levels (Theil Index, 2006 and 2009)



These results are coherent with the previous evidence: total inequality remained stable because a compression of earnings in the upper tail and an increase of the dispersion in the lower part of the distribution

indeed this corresponds to a reduction of variability within the group of high-skilled workers and an advance of dispersion among the low-skilled ones.

(v) Data and First Descriptive Evidence

Median hourly earnings by education and employment status (2009 and 2006-2009 % change)

	Primary						*Seconday*						*Tertiary*					
Country	Perm	Δ	Temp	Δ	Self	Δ	Perm	Δ	Temp	Δ	Self	Δ	Perm	Δ	Temp	Δ	Self	Δ
AT	10.61	*5.4*	4.81	*13.6*	6.97	*3.8*	13.89	*4.8*	10.61	*0.6*	9.78	*14.7*	19.57	*3.6*	15.57	*-2.7*	12.65	*7.2*
BE	12.95	*-2.8*	10.04	*-4.9*	7.32	*17.7*	14.03	*-3.3*	11.07	*1.7*	7.97	*14.0*	18.12	*0.4*	14.30	*6.4*	10.81	*13.3*
DE	7.85	*-28.3*	7.24	*23.5*	11.01	*68.7*	13.14	*-3.1*	7.92	*-11.5*	9.39	*-15.2*	18.49	*2.9*	13.08	*9.8*	12.83	*-3.5*
ES	8.13	*-2.0*	6.92	*1.6*	4.75	*-17.3*	9.64	*-3.1*	7.41	*6.1*	5.73	*-11.7*	13.85	*0.2*	9.96	*8.6*	6.92	*-18.3*
FI	11.51	*6.9*	9.84	*38.3*	7.60	*0.6*	12.08	*7.3*	9.71	*15.6*	7.97	*7.7*	16.84	*4.2*	13.26	*15.6*	11.49	*12.2*
FR	10.19	*0.1*	8.43	*8.2*	4.99	*-35.4*	11.21	*2.0*	8.49	*3.2*	6.47	*-18.6*	14.61	*-2.0*	9.67	*-3.3*	13.55	*-8.0*
GR	8.35	*-3.7*	7.12	*8.0*	5.22	*0.2*	9.26	*0.7*	6.22	*-1.3*	6.86	*3.4*	14.82	*-12.2*	8.31	*-6.4*	11.18	*-0.9*
IT	10.22	*1.8*	7.62	*4.0*	9.09	*6.6*	12.18	*-1.3*	8.22	*-3.1*	10.81	*5.2*	16.47	*-5.1*	10.98	*-12.9*	15.10	*3.4*
NL	16.22	*9.1*	13.52	*14.2*	10.11	*-32.1*	18.85	*9.0*	15.40	*7.9*	11.84	*-6.0*	25.21	*7.8*	21.15	*17.0*	18.03	*0.4*
PT	5.54	*8.0*	4.58	*10.7*	4.04	*-6.1*	7.25	*-4.3*	4.99	*13.7*	4.46	*-26.0*	16.42	*-10.2*	9.64	*13.9*	7.81	*-4.5*
SE	13.08	*13.0*	9.94	*57.1*	4.93	*-41.4*	14.00	*17.8*	9.84	*36.5*	4.92	*-40.1*	16.20	*21.0*	11.10	*20.5*	5.57	*-38.5*
UK	9.54	*-8.5*	8.43	*-5.0*	8.38	*-0.7*	10.83	*-17.1*	8.69	*-23.3*	9.03	*-22.7*	17.11	*-15.8*	15.51	*-17.6*	13.24	*-24.0*
WEST	9.52	*-0.4*	7.07	*5.4*	6.71	*1.0*	12.43	*-0.6*	8.39	*0.8*	8.93	*0.7*	16.99	*-1.1*	11.65	*4.5*	12.20	*-1.5*

Temporary workers and self-employed contribute to the downward earnings inequality

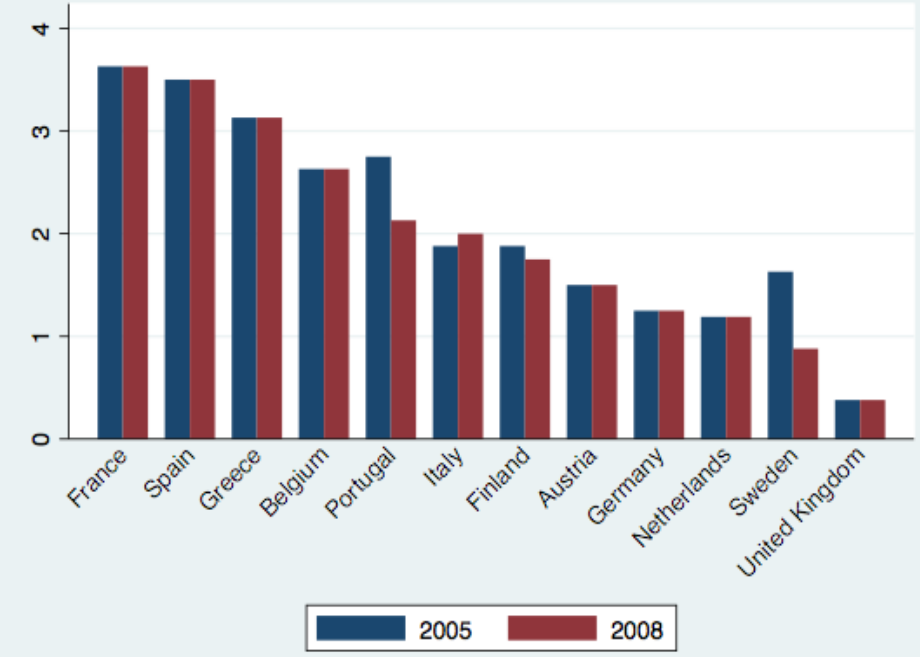
On average, in western countries, the temporary workers wage is respectively 74%, 67% and 68% of the permanent workers wage in the primary, secondary and tertiary education groups

In almost all countries the higher the education level, the higher the distance between wages accruing to these different status in employment (permanent/temporary positions); exceptions have been found in Austria, the Netherlands and the UK

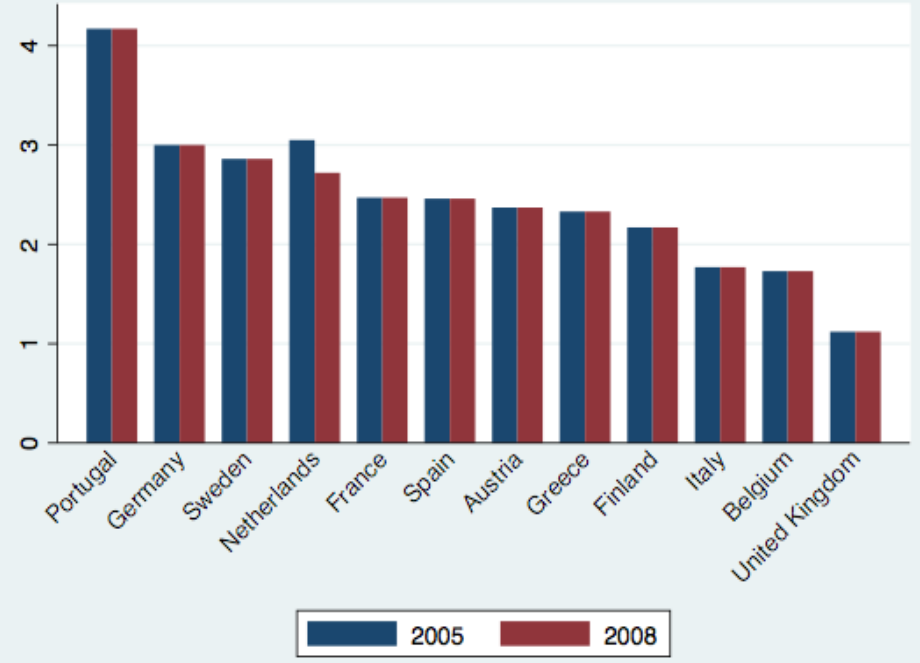
(v) Data and First Descriptive Evidence

EPLt and EPLr in Western European countries in 2005 and 2008

EPLt (source: OECD)



EPLr (source: OECD)



Employment Protection Legislation remained stable between 2005 and 2008

At first glance it seems that no correlation exists between EPLt and inequality discussed above, for example in both France and the UK inequality enlarged, even though these two countries are located respectively at the top and at the bottom of the ranking concerning the stringency of EPLt

In any case, if we compare EPLt and EPLr important asymmetries in the protection levels emerge in 7 countries out of 12, the number of countries and the size of the gap is also higher if we consider the revised EPLr OECD index that takes into account also the protection measures in case of collective dismissals

(iv) Employment Protection Legislation and Relative Hourly Earnings:

The econometric specification

$$DLM_{i,k} = c_i + age_{i,k}a_1 + a_2 age_{i,k}^2 + a_3 gender_{i,k} + b_1 temp + b_2 self + b_3 part + b_4 sjob + \sum_{s=1}^{2} b_s size_s + \sum_{n=1}^{7} b_n \sec_n$$
$$+ g_1 EPLt_k + g_2 EPLr_k + g_3 UD_k + g_4 PMD_k + g_5 DGDP_k + g_6 UR_k + w\,temp \cdot EPLt_k + d_k + e_{i,k}$$

where

i= [1,.. 95,723] in 2006 ; and [1,…89,325] in 2009 (individuals)

k= 1, …12 (countries)

j= 1, …3 (education groups)

$DLM_{i,j,k} = \ln y_{i,j,k} - \overline{\ln y}_{jk}$ is the median log deviation, that is the difference between the log individual hourly earning and median hourly earnings of the respective country (k) and education group (j)

Key explanatory variables

temp= dummy variable for temporary worker status

$EPLt_k$= protection for temporary workers (country lev.)

Temp x $EPLt_k$ = *interaction term*

Control variables at country level

$EPLr_k$= protection for regular workers

PMD= product market deregulation

GDP = growth rate

UR= unemployment rate

Control variables at individual level

temp= dummy variable for temporary worker status

self= dummy variable for self-employed status

part= dummy variable for part-timer status

sjob= dummy variable presence of second job

size= 1,..3 (<10; 10-49; >49 employees)

sec= 1,..8 (sectors: Agriculture; Industry; Construction; Trade; Transport; Hotels & Rest; Business Services; Other Serv.)

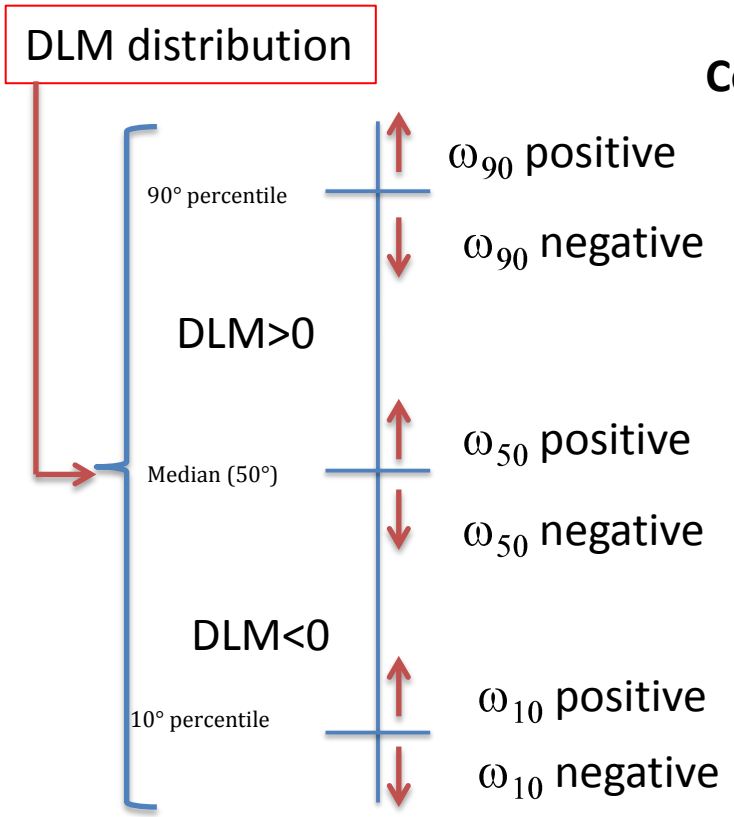
(iv) Employment Protection Legislation and Relative Hourly Earnings:

Interpretation of the dependent variable in different econometric specifications

$$DLM_{i,j,k} = \ln y_{i,j,k} - \overline{\ln y}_{jk}$$

$$w\,temp \times EPLt_k$$

$$\frac{\partial DLM}{\partial (temp \cdot EPLT)} = \omega$$



Coefficient of the interaction term in OLS regression

temp = how being temporary (compared to permanent) affects relative earning position

EPLt*temp = effect of EPLt additional to the effect of being temporary, i.e., correction of the temp coefficient in contexts with different EPLt levels

Coefficient of the interaction term in quantile regression

If ω_{90} is positive: upward increase of inequality

If ω_{90} is negative: earnings compression from the upper part of the distribution towards the median

If ω_{10} is positive: earnings compression from the lower part of the distribution towards the median

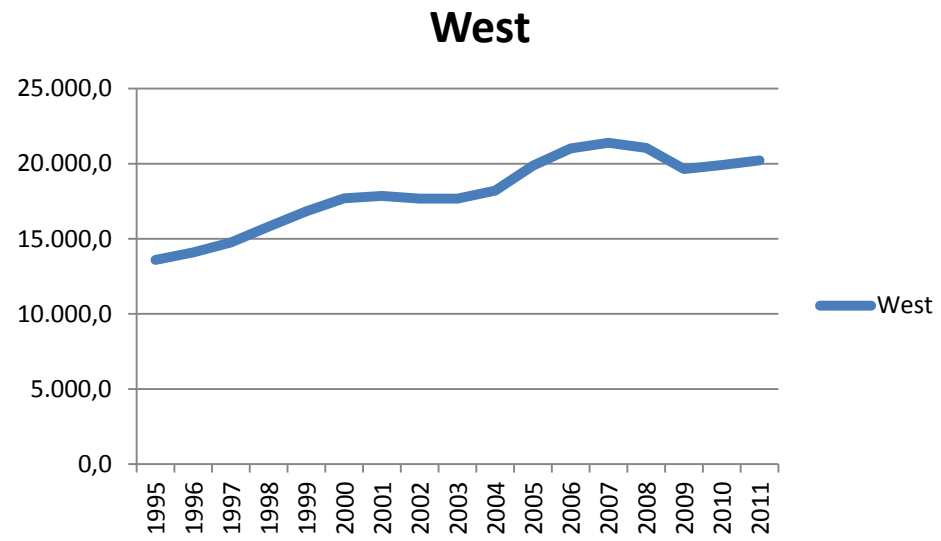
If ω_{90} is negative: downward increase of inequality

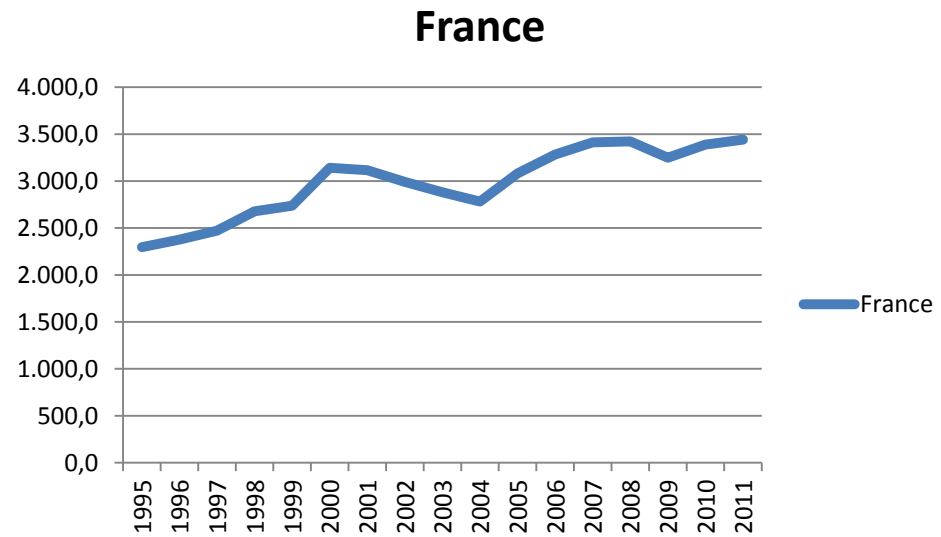
(iv) Employment Protection Legislation and Hourly Earnings: Results

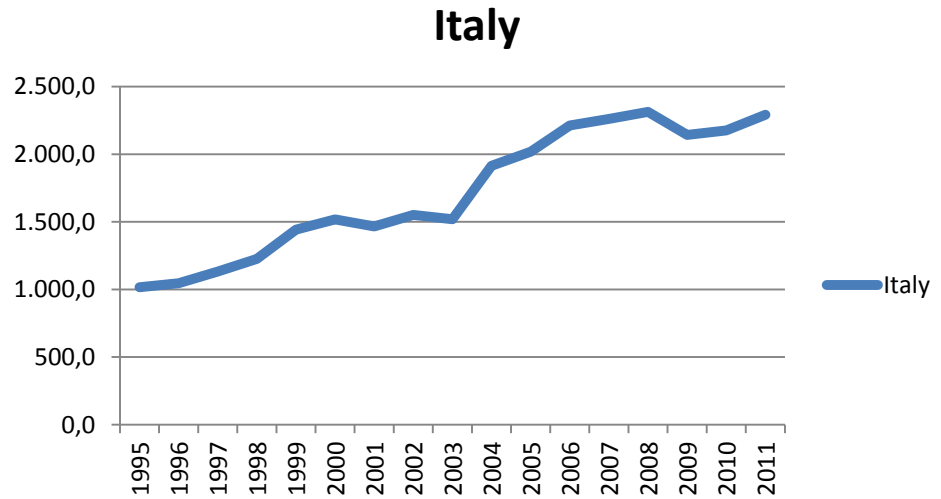
Quantile Regression within the Primary Education Group of Workers

	2006			2009		
	θ =.10	θ = 50	θ = 90	θ =.10	θ = 50	θ = 90
EPL(t) * Temp	0.142 ***	0.080 ***	0.012	0.065 ***	0.046 ***	0.011
	(0.021)	*(0.010)*	*(0.017)*	*(0.025)*	*(0.012)*	*(0.020)*
Temp	-0.633 ***	-0.399 ***	-0.152 ***	-0.404 ***	-0.257 ***	-0.127 **
	(0.063)	*(0.031)*	*(0.050)*	*(0.068)*	*(0.035)*	*(0.053)*
EPL(t)	0.094 ***	0.032 **	0.032 *	0.003	-0.004	-0.075 ***
	(0.017)	*(0.013)*	*(0.017)*	*(0.011)*	*(0.007)*	*(0.016)*
EPL (r)	0.025 **	0.027 ***	0.080 ***	0.052 ***	0.025 ***	0.046 ***
	(0.010)	*(0.005)*	*(0.010)*	*(0.008)*	*(0.005)*	*(0.011)*
PM Dereg	-0.081 ***	-0.072 ***	-0.167 ***	0.063 ***	-0.024 **	0.013
	(0.025)	*(0.009)*	*(0.017)*	*(0.023)*	*(0.011)*	*(0.021)*
UD	0.002 *	0.003 ***	0.004 ***	0.002 **	0.000	-0.003 ***
	(0.001)	*(0.000)*	*(0.001)*	*(0.001)*	*(0.000)*	*(0.001)*
Δ Real GDP	0.023 ***	0.029 ***	0.047 ***	0.003	-0.008 ***	-0.013 *
	(0.009)	*(0.005)*	*(0.007)*	*(0.006)*	*(0.003)*	*(0.007)*
UR	-0.045 ***	0.012 **	0.032 ***	0.008 ***	0.007 ***	0.012 ***
	(0.007)	*(0.006)*	*(0.008)*	*(0.003)*	*(0.001)*	*(0.002)*
Self	-0.649 ***	-0.172 ***	0.184 ***	-0.820 ***	-0.231 ***	0.089
	(0.030)	*(0.013)*	*(0.021)*	*(0.149)*	*(0.058)*	*(0.092)*
Gender (male = 1)	0.210 ***	0.202 ***	0.243 ***	0.184 ***	0.198 ***	0.246 ***
	(0.012)	*(0.007)*	*(0.013)*	*(0.012)*	*(0.008)*	*(0.013)*
Part-time	-0.081 ***	-0.011	0.129 ***	-0.031 *	0.028 **	0.144 ***
	(0.017)	*(0.010)*	*(0.020)*	*(0.018)*	*(0.011)*	*(0.020)*
Age	0.052 ***	0.039 ***	0.031 ***	0.056 ***	0.042 ***	0.036 ***
	(0.004)	*(0.002)*	*(0.003)*	*(0.004)*	*(0.002)*	*(0.004)*
Age^2	-0.001 ***	-0.000 ***	-0.000 ***	-0.001 ***	-0.000 ***	-0.000 ***
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*
2^{nd} Job	0.074 ***	0.071 ***	0.103 ***	0.589 ***	0.478 ***	0.825 ***
	(0.015)	*(0.009)*	*(0.016)*	*(0.121)*	*(0.147)*	*(0.249)*
Firm size (11-49)	0.135 ***	0.084 ***	0.090 ***	0.134 ***	0.086 ***	0.090 ***
	(0.013)	*(0.007)*	*(0.014)*	*(0.015)*	*(0.008)*	*(0.014)*
Firm size (> 50)	0.222 ***	0.191 ***	0.180 ***	0.220 ***	0.167 ***	0.165 ***
	(0.014)	*(0.008)*	*(0.014)*	*(0.015)*	*(0.008)*	*(0.015)*
Constant	-1.389 ***	-1.055 ***	-0.215 **	-2.866 ***	-1.389 ***	-0.970 ***
	(0.186)	*(0.060)*	*(0.108)*	*(0.170)*	*(0.084)*	*(0.160)*
Country dummies	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Sector dummies	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Obs	23183	23183	23183	16363	16363	16363
Pseudo R^2	0.218	0.118	0.091	0.191	0.119	0.116

Temporary employees in Western European countries







(iv) Employment Protection Legislation and Hourly Earnings: Results

Quantile Regression within the Secondary Education Group of Workers

	2006			2009		
	θ =.10	θ = 50	θ = 90	θ =.10	θ = 50	θ = 90
EPL(t) * Temp	0.045 ***	0.013	-0.031 **	0.076 ***	0.030 ***	0.014
	(0.017)	*(0.011)*	*(0.014)*	*(0.016)*	*(0.010)*	*(0.017)*
Temp	-0.457 ***	-0.223 ***	0.018	-0.477 ***	-0.268 ***	-0.111 **
	(0.043)	*(0.026)*	*(0.038)*	*(0.043)*	*(0.029)*	*(0.044)*
EPL(t)	0.112 ***	0.060 ***	0.115 ***	0.014 **	-0.021 ***	-0.120 ***
	(0.009)	*(0.005)*	*(0.008)*	*(0.006)*	*(0.005)*	*(0.008)*
EPL (r)	0.003	0.054 ***	0.161 ***	0.051 ***	0.045 ***	0.124 ***
	(0.016)	*(0.011)*	*(0.020)*	*(0.010)*	*(0.008)*	*(0.012)*
PM Dereg	-0.054 ***	-0.089 ***	-0.229 ***	0.052 ***	-0.044 ***	-0.042 ***
	(0.014)	*(0.009)*	*(0.015)*	*(0.012)*	*(0.007)*	*(0.011)*
UD	0.003 ***	0.004 ***	0.007 ***	0.002 ***	0.001 ***	-0.001 ***
	(0.001)	*(0.000)*	*(0.001)*	*(0.000)*	*(0.000)*	*(0.000)*
Δ Real GDP	0.021 ***	0.024 ***	0.041 ***	0.010 ***	0.004	0.001
	(0.007)	*(0.004)*	*(0.008)*	*(0.004)*	*(0.002)*	*(0.004)*
UR	-0.040 ***	0.000	0.002	-0.003	0.006 ***	0.013 ***
	(0.003)	*(0.002)*	*(0.003)*	*(0.002)*	*(0.001)*	*(0.002)*
Self	-0.746 ***	-0.194 ***	0.164 ***	-0.899 ***	-0.327 ***	0.005
	(0.029)	*(0.012)*	*(0.019)*	*(0.169)*	*(0.068)*	*(0.072)*
Gender (male = 1)	0.141 ***	0.145 ***	0.178 ***	0.114 ***	0.127 ***	0.153 ***
	(0.009)	*(0.005)*	*(0.009)*	*(0.009)*	*(0.006)*	*(0.008)*
Part-time	-0.130 ***	-0.050 ***	0.053 ***	-0.106 ***	-0.038 ***	0.078 ***
	(0.012)	*(0.007)*	*(0.011)*	*(0.013)*	*(0.007)*	*(0.011)*
Age	0.058 ***	0.041 ***	0.037 ***	0.057 ***	0.038 ***	0.033 ***
	(0.003)	*(0.002)*	*(0.003)*	*(0.003)*	*(0.002)*	*(0.003)*
Age^2	-0.001 ***	-0.000 ***	-0.000 ***	-0.001 ***	-0.000 ***	-0.000 ***
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*
2nd Job	0.052 ***	0.055 ***	0.112 ***	0.273	0.637 ***	0.876 ***
	(0.012)	*(0.007)*	*(0.013)*	*(0.168)*	*(0.123)*	*(0.144)*
Firm size (11-49)	0.168 ***	0.111 ***	0.089 ***	0.134 ***	0.089 ***	0.062 ***
	(0.011)	*(0.006)*	*(0.009)*	*(0.012)*	*(0.006)*	*(0.010)*
Firm size (> 50)	0.277 ***	0.204 ***	0.161 ***	0.225 ***	0.190 ***	0.143 ***
	(0.011)	*(0.006)*	*(0.010)*	*(0.011)*	*(0.006)*	*(0.010)*
Constant	-1.956 ***	-1.248 ***	-0.449 ***	-2.490 ***	-1.054 ***	-0.576 ***
	(0.087)	*(0.052)*	*(0.080)*	*(0.093)*	*(0.055)*	*(0.094)*
Country dummies	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Sector dummies	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Obs	42484	42484	42484	33641	33641	33641
Pseudo R^2	0.186	0.122	0.116	0.176	0.133	0.121

Notes: Robust standard errors in parentheses. ***, ** and * denote significance at the 1, 5 and 10 percent level, respectively. EPL(t),

(iv) Employment Protection Legislation and Hourly Earnings: Results

Quantile Regression within the Tertiary Education Group of Workers

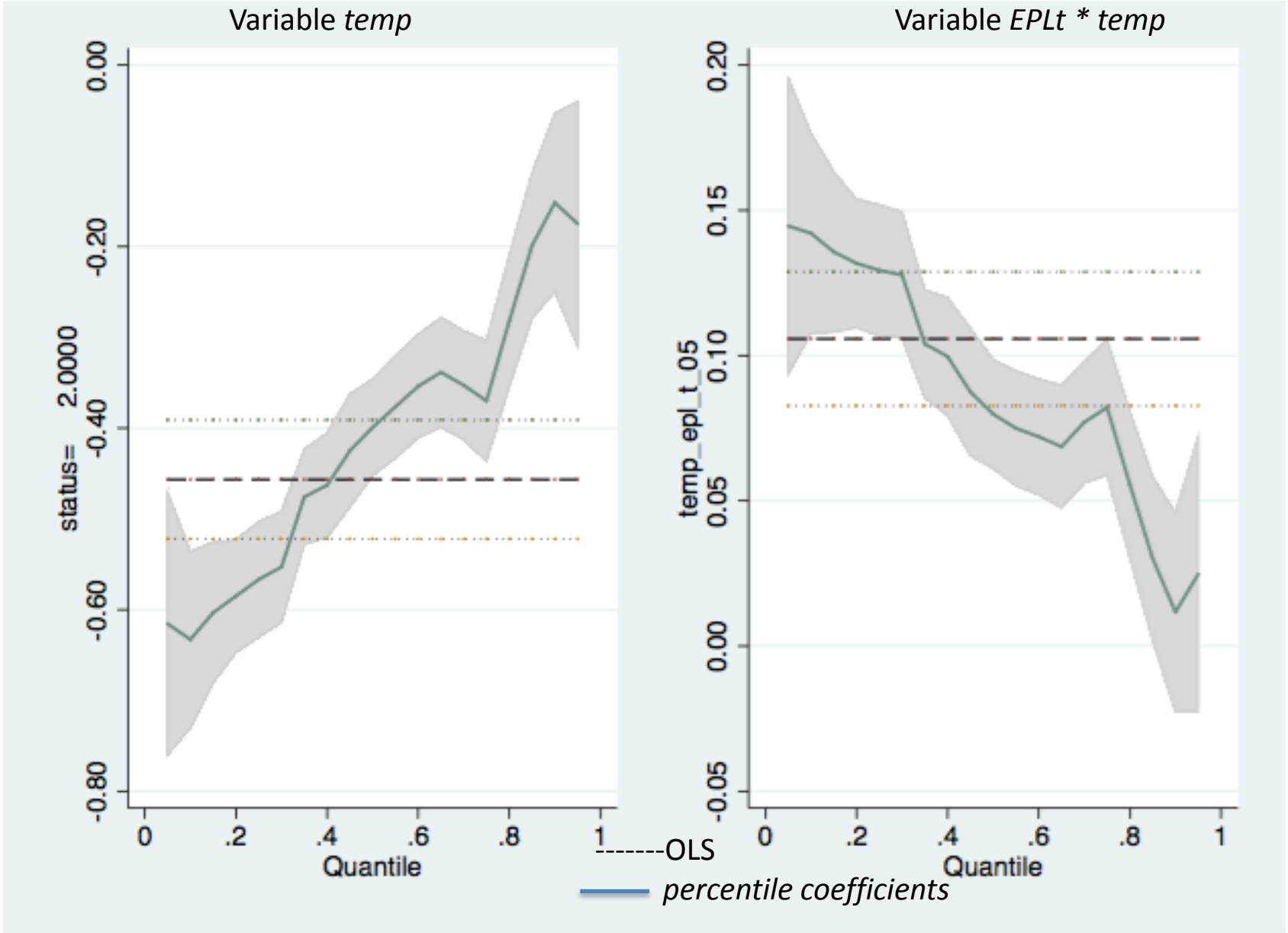
	2006			2009		
	θ =.10	θ = 50	θ = 90	θ =.10	θ = 50	θ = 90
EPL(t) * Temp	0.061 ***	-0.012	0.003	0.032	-0.012	0.022
	(0.023)	*(0.010)*	*(0.022)*	*(0.023)*	*(0.011)*	*(0.015)*
Temp	-0.498 ***	-0.148 ***	-0.077	-0.396 ***	-0.141 ***	-0.101 ***
	(0.063)	*(0.024)*	*(0.063)*	*(0.065)*	*(0.027)*	*(0.033)*
EPL(t)	0.049 ***	0.040 ***	0.059 ***	0.091 ***	-0.002	-0.056 ***
	(0.013)	*(0.007)*	*(0.007)*	*(0.010)*	*(0.006)*	*(0.008)*
EPL (r)	-0.057 **	-0.003	-0.004	-0.040 ***	0.017 *	0.011
	(0.025)	*(0.014)*	*(0.012)*	*(0.015)*	*(0.010)*	*(0.013)*
PM Dereg	0.108 ***	-0.042 ***	-0.136 ***	0.030	-0.054 ***	-0.070 ***
	(0.021)	*(0.012)*	*(0.013)*	*(0.019)*	*(0.010)*	*(0.018)*
UD	-0.001	0.001 ***	0.003 ***	0.002 ***	0.001 ***	-0.002 ***
	(0.001)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*
Δ Real GDP	-0.013	0.004	0.021 ***	-0.001	0.007 ***	-0.006
	(0.010)	*(0.006)*	*(0.006)*	*(0.004)*	*(0.003)*	*(0.004)*
UR	-0.039 ***	-0.001	0.002	-0.003	0.005 ***	0.007 ***
	(0.004)	*(0.002)*	*(0.004)*	*(0.002)*	*(0.001)*	*(0.002)*
Self	-0.744 ***	-0.203 ***	0.216 ***	-0.910 ***	-0.207 ***	0.021
	(0.040)	*(0.018)*	*(0.024)*	*(0.179)*	*(0.068)*	*(0.085)*
Gender (male = 1)	0.108 ***	0.136 ***	0.131 ***	0.106 ***	0.127 ***	0.130 ***
	(0.012)	*(0.007)*	*(0.009)*	*(0.009)*	*(0.006)*	*(0.009)*
Part-time	-0.171 ***	-0.067 ***	0.009	-0.134 ***	-0.031 ***	0.064 ***
	(0.018)	*(0.009)*	*(0.014)*	*(0.016)*	*(0.009)*	*(0.013)*
Age	0.074 ***	0.064 ***	0.066 ***	0.057 ***	0.053 ***	0.063 ***
	(0.006)	*(0.003)*	*(0.004)*	*(0.004)*	*(0.002)*	*(0.003)*
Age^2	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 ***	-0.000 ***	-0.001 ***
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*
2^{nd} Job	0.097 ***	0.096 ***	0.161 ***	0.421 ***	0.632 ***	0.895 ***
	(0.019)	*(0.011)*	*(0.018)*	*(0.097)*	*(0.064)*	*(0.132)*
Firm size (11-49)	0.199 ***	0.122 ***	0.092 ***	0.210 ***	0.130 ***	0.083 ***
	(0.019)	*(0.011)*	*(0.014)*	*(0.015)*	*(0.010)*	*(0.013)*
Firm size (> 50)	0.314 ***	0.228 ***	0.174 ***	0.338 ***	0.239 ***	0.168 ***
	(0.018)	*(0.010)*	*(0.012)*	*(0.015)*	*(0.010)*	*(0.013)*
Constant	-3.088 ***	-1.972 ***	-1.145 ***	-2.857 ***	-1.480 ***	-0.994 ***
	(0.184)	*(0.086)*	*(0.117)*	*(0.187)*	*(0.093)*	*(0.151)*
Country dummies	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Sector dummies	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Obs	27596	27596	27596	25380	25380	25380
Pseudo R^2	0.169	0.129	0.112	0.162	0.143	0.123

Notes: Robust standard errors in parentheses, *** ** and * denote significance at the 1, 5 and 10 percent level, respectively. EPL (t)

(iv) Employment Protection Legislation and Hourly Earnings: OLS and percentile coefficients

OLS and Quantile Regression within the Primary Education Group of Workers

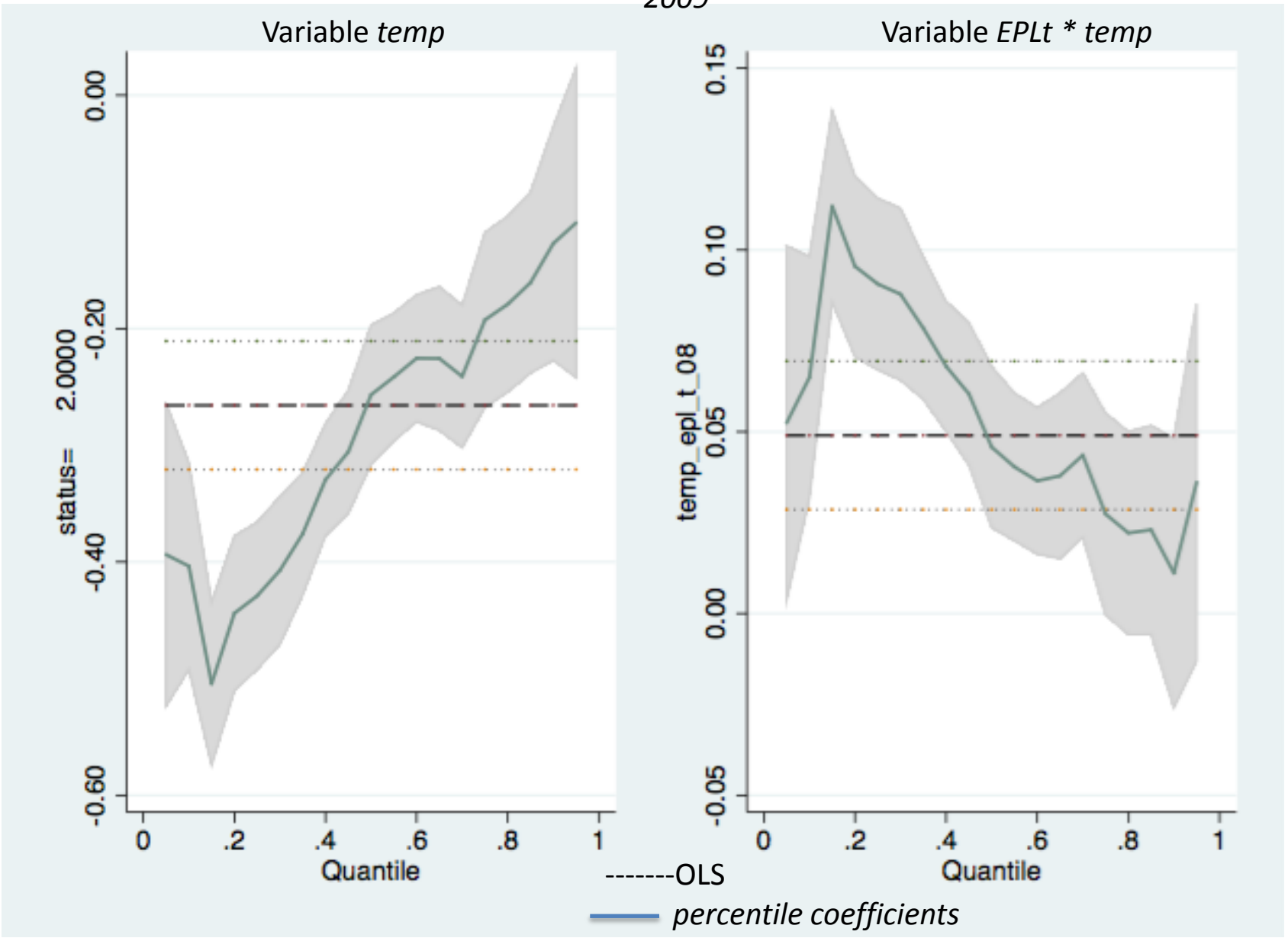
2006



(iv) Employment Protection Legislation and Hourly Earnings: Results

OLS and Quantile Regression within the Primary Education Group of Workers

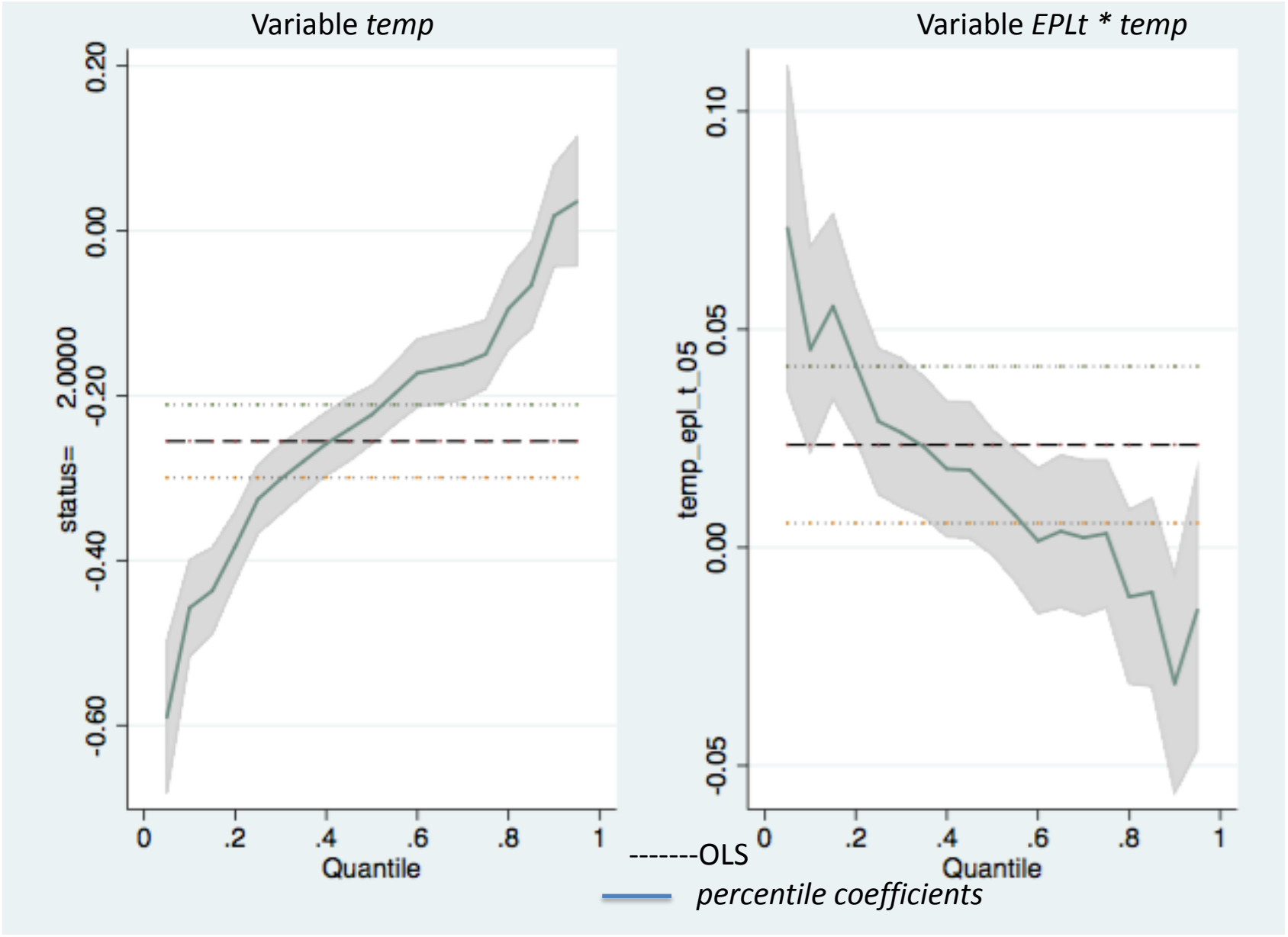
2009



(iv) Employment Protection Legislation and Hourly Earnings: OLS and percentile coefficients

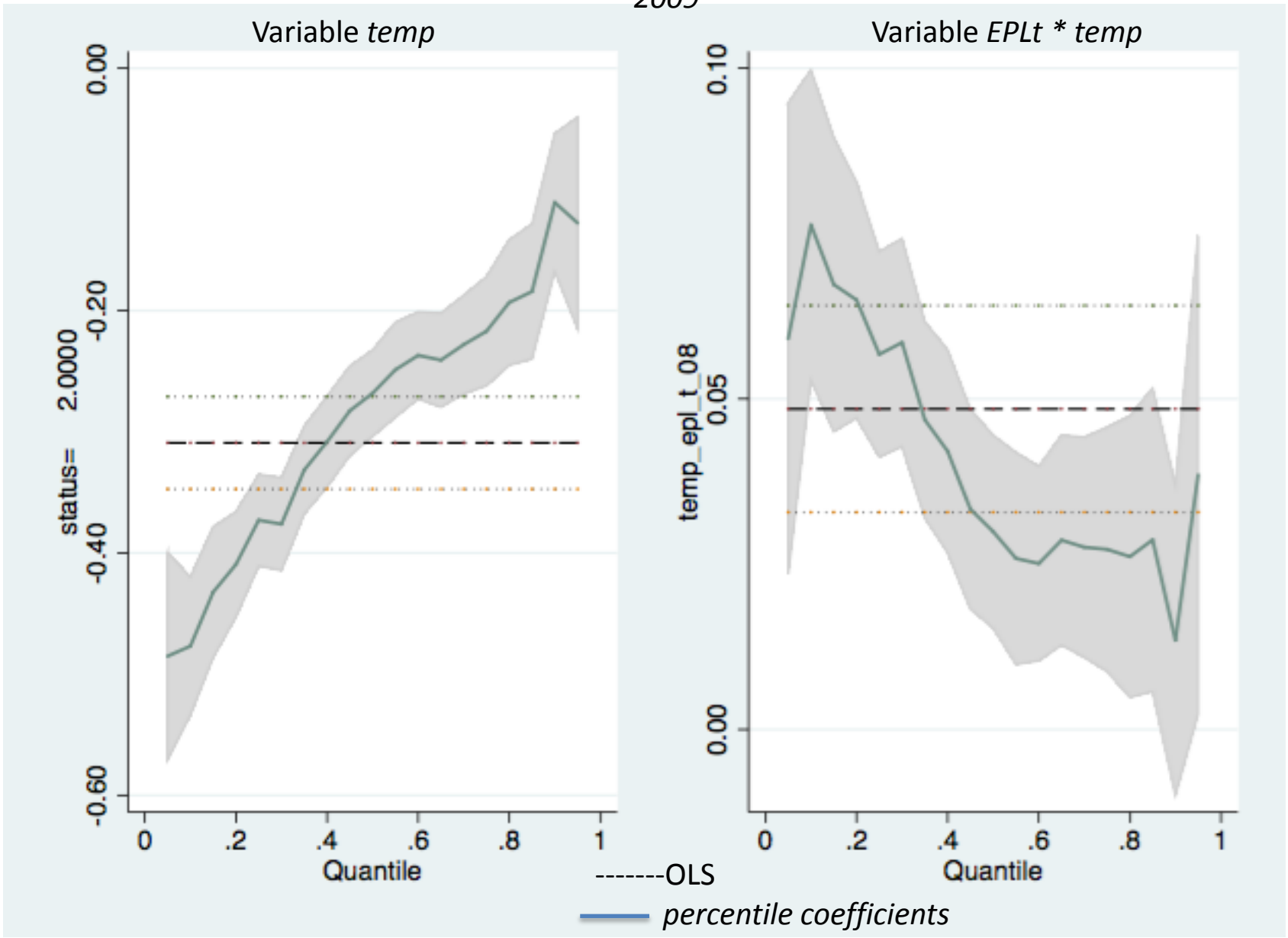
OLS and Quantile Regression within the Secondary Education Group of Workers

2006



(iv) Employment Protection Legislation and Hourly Earnings: Results

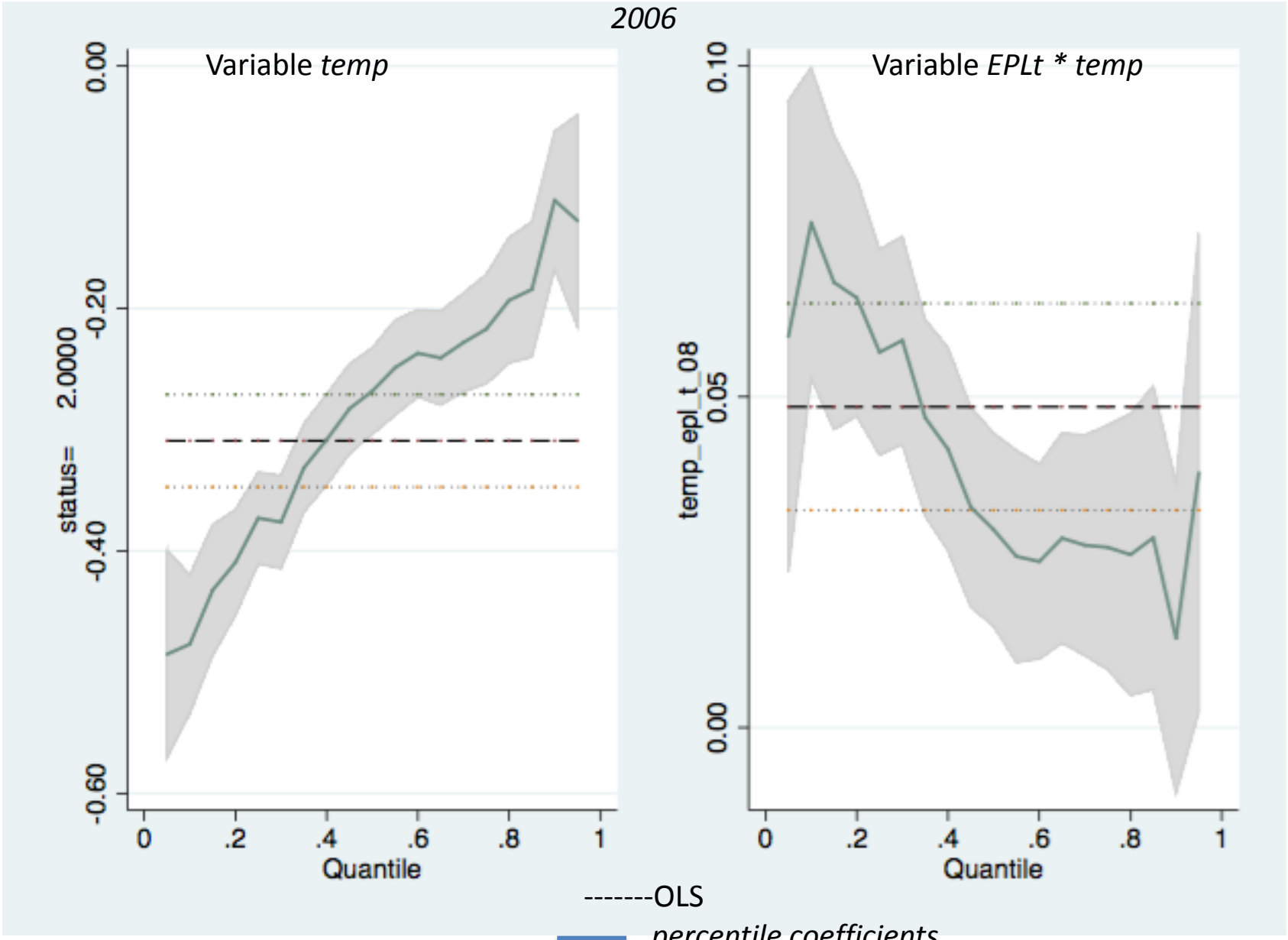
OLS and Quantile Regression within the Secondary Education Group of Workers 2009



(iv) Employment Protection Legislation and Hourly Earnings: OLS and percentile coefficients

OLS and Quantile Regression within the Tertiary Education Group of Workers

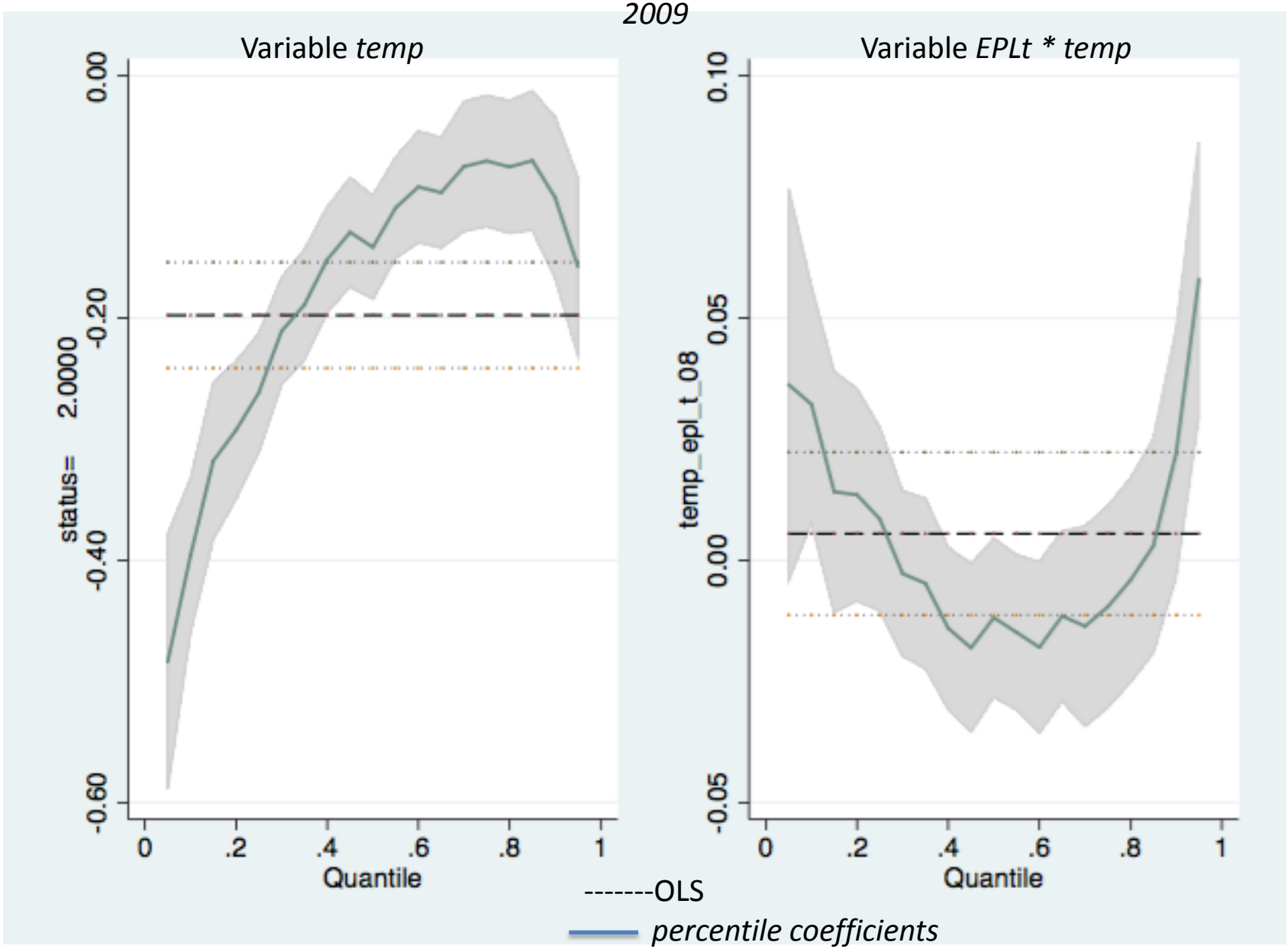
2006



(iv) Employment Protection Legislation and Hourly Earnings: Results

OLS and Quantile Regression within the Tertiary Education Group of Workers

2009



(v) Interpretation and concluding Remarks

Between 2006 and 2009 earnings inequality within western European Union countries has been stable or slightly decreasing (exceptions being France and the UK)

This evidence was the combined effect of (i) compression at the upper tail; and (ii) enlargement at the lower tail of the earnings distribution

The differences in median hourly earnings across the education groups of workers are remarkable but remained substantially stable over the period considered

On the contrary, inequality within education groups changed remarkably: inequality within workers with primary education increased compared to what happened to higher education levels

Employment status emerges as an important source of earnings inequality within each education group

Regardless the education level, both self-employed and temporary workers are associated to lower relative median earnings compared to permanent positions

(v) Interpretation and concluding Remarks

Namely, the status of temporary worker contributes to:
(i) Reducing inequality in the upper part of the distribution
(ii) Increasing inequality in the lower part of the distribution

However, stricter employment protection legislation for temporary workers mitigates this bottom inequality enhancing effect of being temporary, in all education groups

This result is substantially confirmed in times of crisis (2009), particularly for low and medium-skilled workers

These results may be important in view of current policy trends oriented towards weaker protection for temporary workers, motivated by the need to achieve a quick recovery in employment

Our results suggest that the side effects of such a strategy could be a further extension of inequality at the bottom of the distribution, with consequent effects on: (i) social justice; (ii) incentives for workers/employers and productivity dynamics

COMPONENTS OF EPLT INDICATOR AND ITS AGGREGATION WEIGHTS

Panel B: EPLT

Item (weight)	Original unit and short description	Assigned strictness score						
		0	1	2	3	4	5	6
Valid cases for use of fixed-term contracts (1/4)	Conditions under which the use of fixed-term contracts is allowed	0, fixed-term contracts are permitted only for "objective" or "material situation", i.e. to perform a task which itself is of fixed duration; 2, if specific exemptions apply to situations of employer need (e.g. launching a new activity) or employee need (e.g. workers in search of their first job); 4, when exemptions exist on both the employer and employee sides; 6, when there are no restrictions on the use of fixed-term contracts.						
Maximum number of successive fixed-term contracts (1/8)	Number	No limit	≥ 5	≥ 4	≥ 3	≥ 2	≥ 1.5	< 1.5
Maximum cumulated duration of successive fixed-term contracts (1/8)	Months	No limit	≥ 36	≥ 30	≥ 24	≥ 18	≥ 12	< 12
Types of work for which temporary work agency (TWA) employment is legal (1/4)	Extent and type of restrictions to TWA employment	Scale (0-4) × 6/4. 0, when TWA employment is illegal; between 0 and 4 when TWA employment is legal but restrictions apply (the score being proportional to the severity of the restriction); 4 when no restriction applies.						
Restrictions on the number of renewals of TWA contracts (1/8)	Yes/No	0 if No, 6 if Yes						
Maximum cumulated duration of TWA contracts (1/8)	Months	No limit	≥ 36	≥ 24	≥ 18	≥ 12	> 6	≤ 6

COMPONENTS OF EPLR INDICATOR AND ITS AGGREGATION WEIGHTS

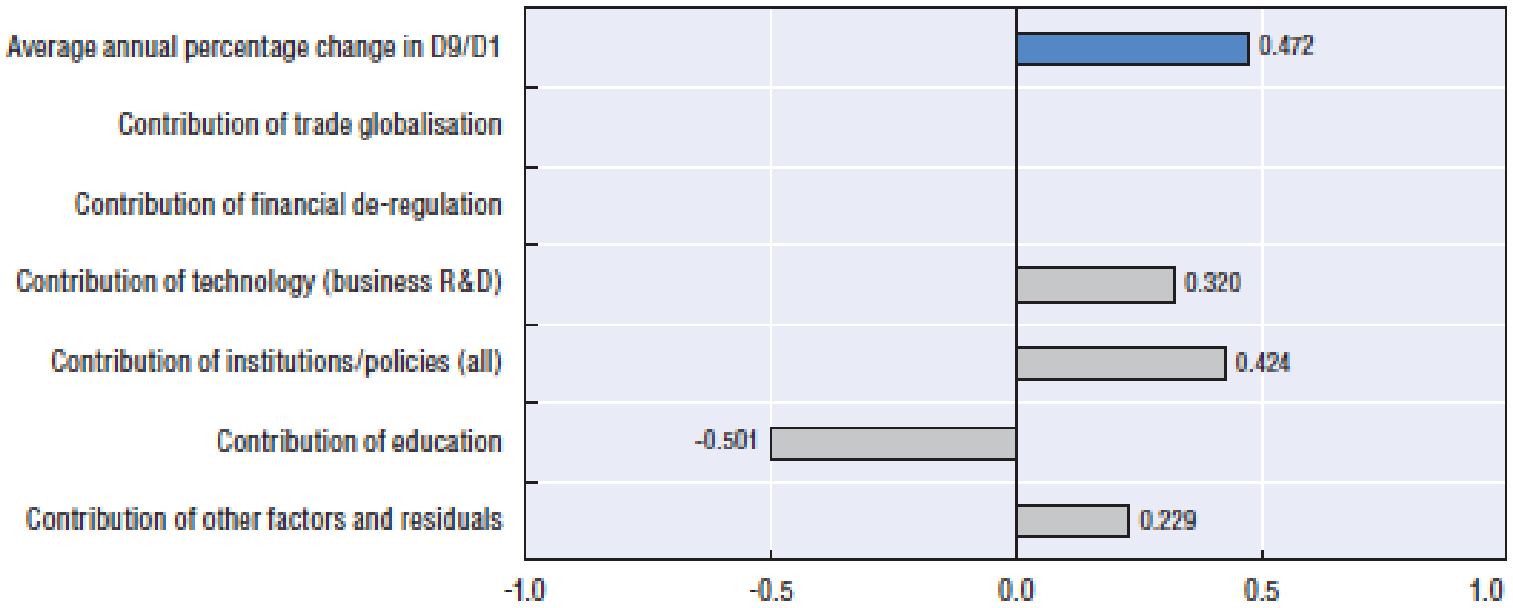
Panel A: EPLR

Item (weight)	Original unit and short description	Assigned strictness score						
		0	1	2	3	4	5	6
Delay involved before notice can start (1/6)	Days (Estimated)	≤ 2	< 10	< 18	< 26	< 35	< 45	≥ 45
Notification procedures (1/6)	Oral or written statements, notification to a third party (such as works council or the competent labour authority), authorisation to be requested	0, when an oral statement is enough; 2, when a written statement of the reasons for dismissal must be supplied to the employee; 4, when a third party must be notified; 6; when the employer cannot proceed to dismissal without authorisation from a third party.						
Notice period (1/21 for each tenure category)	Length in months (at 9 months)	0	≤ 0.4	≤ 0.8	≤ 1.2	< 1.6	< 2	≥ 2
	Length in months (at 4 years)	0	≤ 0.75	≤ 1.25	< 2	< 2.5	< 3.5	≥ 3.5
	Length in months (at 20 years)	< 1	≤ 2.75	< 5	< 7	< 9	< 11	≥ 11
Severance pay (4/63 for each tenure category)	Months pay (at 9 months)	0	≤ 0.5	≤ 1	≤ 1.75	≤ 2.5	< 3	≥ 3
	Months pay at (at 4 years)	0	≤ 0.5	≤ 1	≤ 2	≤ 3	< 4	≥ 4
	Months pay (at 20 years)	0	≤ 3	≤ 6	≤ 10	≤ 12	≤ 18	> 18
Definition of justified or unfair dismissal (1/12)	Legal definition	0, when worker capability or redundancy of the job are sufficient ground for dismissal; 2, when social considerations, age or job tenure must when possible influence the choice of which worker(s) to dismiss; 4, when a transfer and/or a retraining to adapt the worker to different work must be attempted prior to dismissal; 6, when worker capability or redundancy of the job cannot be a ground for dismissal.						
Length of trial period (1/12)	Months	≥ 24	> 12	> 9	> 5	> 2.5	≥ 1.5	< 1.5
Compensation after unfair dismissal (1/12)	Months pay	≤ 3	≤ 8	≤ 12	≤ 18	≤ 24	≤ 30	> 30
Reinstatement (1/12)	Extent of reinstatement: conditions under which, after a finding of unfair dismissal, the employee has the option of reinstatement into his/her previous job, even if this is against the wishes of the employer.	0, never; 1, reinstatement ordered only after violation of specific laws (such as anti-discrimination laws); 2, reinstatement orders are possible but rare; 3, courts may order reinstatement with back pay or compensation; 4, frequent reinstatement orders with back pay or compensation; 5, Unfair dismissal gives rise to a right to reinstatement, except in cases where court decides that the employer cannot be fairly required to reinstate the employee in question; 6, always.						

DIVIDED WE STAND, OECD 2011

Figure 2.3. **Accounting for changes in wage inequality: the role of globalisation, technology and labour market policies and institutions**

Average annual percentage changes



Note: Other factors include sectoral employment shares and female employment share. The contributions of trade and financial deregulation are not reported due to imprecise estimates of coefficients.

Source: Table 2.1; OECD Secretariat calculations.

According to OECD, the increased share of educated workers exerted a sizable equalising effect, offsetting about two-thirds of the rise in the D9/D1 ratio due to the combined effects of institutions and technology

We found that excessive deregulation of labour market for temporary workers in Western countries could attenuate the positive role of education, by reinforcing a bad labour market duality in which the wage gap between temporary and permanent workers enlarges.

INEQUALITY MEASURES (i):

Theil's T Index to decompose income by different sectors

Theil's T index is a well known inequality index that stems from generalized entropy measures and it is very useful to study inequality decomposability by population sub-groups

$$Theil = \frac{1}{N}\sum_{i=1}^{N}\frac{y_i}{\bar{y}}\ln\left(\frac{y_i}{\bar{y}}\right)$$