Is there a country-specific trade-off between wage inequality and unemployment?

Nathalie Chusseau[a], Michel Dumont[b], Joël Hellier[c] and Glenn Rayp[d]

Abstract: *In the economic literature, the increase in the demand for high-skilled labour that results from both globalisation and technical change is often seen as generating an inequality-unemployment trade-off (IUT) within advanced countries (the North). However, empirical evidence suggests that this trade-off is likely to significantly differ across countries. To explain this, we make a distinction between two types of Northern countries, i.e. those that were egalitarian and those that were inequality-oriented on the eve of both the ICT technological change and globalisation (early eighties). Two propositions are tested: (i) globalisation and technical change generate an IUT that is uneven across countries, and (ii) globalisation results in a trade-off that is more intense for the countries that were initially egalitarian whereas the trade-off induced by technological change is more severe in the countries that were inequality-oriented. Estimations for a panel of thirteen OECD countries over the period 1981-2003 tend to support these propositions showing that the trade-off is country-specific.*

Keywords: Globalisation; Inequality-Unemployment Trade-off; Technical change.

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[a] EQUIPPE and MESHS-CNRS, University of Lille 1, Faculty of Economics and Sociology, Cité Scientifique, 59655 Villeneuve d'Ascq Cedex France. Tel: +33320337013 / Fax: +33320436768. Nathalie.Chusseau@univ-lille1.fr

[b] Belgian Federal Planning Bureau, Kunstlaan 47-49, 1000 Brussels Belgium. Tel: +322507385. dm@plan.be

[c] EQUIPPE and MESHS, University of Lille 1 and LEMNA, University of Nantes, 28 rue de Sévigné, 75004 Paris France. Tel & Fax: +33142775740. joel.hellier@wanadoo.fr

[d] SHERPPA, University of Gent, Tweekerkenstraat 2, B-9000 Gent Belgium. Tel: +3292643495 / Fax: +3292643599. glenn.rayp@ugent.be

1. Introduction

The divergence, witnessed from the mid-1980s onwards between OECD countries in the changes in relative wages and unemployment, has led some scholars to conjecture the existence of a trade-off between inequality and unemployment. They explain divergence by the different responses of countries to a common increase in the demand for high-skilled workers (e.g. Krugman, 1994; Blank, 1997, Davis 1998). The Anglo-Saxon countries (US and UK) are generally presented as favouring market-clearing forces (e.g. wage flexibility) which, with rising demand for high-skilled workers resulted in an increase in the skill premium (wage inequality). In contrast, in Continental Europe labour market institutions (e.g. minimum wages and wage agreements) are believed to have prevented rising inequality at the expense of increasing unemployment of the low-skilled. This so-called 'Transatlantic consensus' has been questioned by several authors (Atkinson, 2001; Singh, 2001) and empirical evidence is not overwhelming (e.g. Conceicao, Ferreira.and Galbraith, 1999, Calistri and Galbraith, 2001, European Communities, 2005 and Mourre, 2005). The major problem with the empirical verification of the trade-off is probably the assumption that differences between countries can be explained by their different position on the same negatively sloped trade-off curve. Whereas Anglo-Saxon countries appear to have prevented unemployment of the low-skilled by allowing for a dramatic increase in inequality, some Scandinavian countries seem to have subdued unemployment as well with only a limited increase in inequality. On the other hand, some Continental European countries (Belgium, France and Germany) combine relatively low inequality with rather high unemployment and Southern Europe witnessed both high inequality and substantial unemployment. The different groups of countries that can be distinguished in terms of the evolution of inequality and unemployment seem to call into question the transatlantic consensus. To the extent that an inequality-unemployment trade-off (IUT) exists, it may differ substantially between countries. Since the early 1980s, the impact of labour market institutions on unemployment on the one hand, and on inequality on the other, has been assessed (see Ayala, Martinez and Riuz-Huerta, 2002 and Arpaia and Mourre, 2005 for a review).

Certain institutions appear to have had a sizeable influence on unemployment (e.g. the tax wedge) whereas others seem to have only a limited impact (e.g. minimum wage). Both Krueger and Pischke (1997) for the US and Card et al. (1999) for the US, France and Canada found no impact of wage rigidity on the relative unemployment of the low-skilled. In contrast,

Puhani (2005) did find a significant trade-off when comparing Germany with the US but also pointed out the need to account for substantial differences in labour supply, i.e. the increase in the supply of high-skilled workers appears to have stabilized the skill premium in Great-Britain in the 1990s. Assessing the impact of policies and institutions on (un)employment in OECD countries over the past decades, Bassanini and Duval (2006) concluded that high unemployment benefits and tax wedges increase unemployment, whereas employment protection legislation has no significant impact and centralised and/or coordinated wage bargaining systems even reduce unemployment. Testing by Jackman et al. (1997) suggests that the so-called 'Krugman hypothesis', i.e. that rigid relative wages raise the unemployment of the low-skilled, cannot explain developments since the 1970s, in Europe. Studies on the impact of institutions on inequality reveal country-specific effects, the most significant influence being found for the UK (Machin, 1997) and the US (Fortin and Lemieux, 1997; Card, 2001). Koeniger et al. (2007) use panel data for eleven OECD countries between 1973 and 1998 to assess the impact of changes in institutions on wage inequality among male workers. They find that stricter employment protection legislation, more generous benefit replacement ratios, longer benefit duration, higher union density and a higher minimum wage reduce wage inequality. Changes in these institutions can explain a large part of observed changes in male wage inequality within OECD countries. In addition, changes in institutions have reduced inequality in France and increased inequality in the US and the UK. Calderon and Chong (2009) present an empirical study of the impact of labour market regulations on income distribution (inequality) by discriminating between *de jure* and *de facto* regulation rules. The first are institutionalised but not always enforced, and the second result from the practice and behaviour of labour market participants. They find that both *de jure* and *de facto* regulations flatten the income distribution although this impact is less robust for the former than for the latter, and that the different regulations appear to have rather uneven effects on the distribution of income.

More recently, the impact of institutions on the inequality-unemployment trade-off itself has been analysed. Ayala et al. (2002), considering the combined effect of different labour market institutions on unemployment and earnings inequality in several OECD countries, found that institutional factors have a greater impact on earnings inequality than on unemployment but also that these effects differ considerably. Bicakova (2006) proposed a model of supply and demand adjustments for different skills to analyse the impact of different institutions on unemployment and inequality (or inactivity) for a given increase in the demand for high-skilled workers. Comparing France to the US and the UK, estimation of the model suggests

that an inequality-unemployment trade-off exists but country-specific effects, depending on differences in labour market institutions, are important. Checchi and Garcia-Penalosa (2008) assess the overall impact of labour market institutions on household income inequality and estimate the magnitude of the trade-off between inequality and unemployment. They found that all considered institutions (except the tax wedge) lower inequality, albeit to a different degree. Certain institutions (unemployment benefits) entail a significant increase in unemployment, whereas others (minimum wage) have a negligible impact. So, although some studies indicate that labour market institutions generate an inequality-unemployment trade-off, the intensity of this trade-off is likely to depend on the specific type of the institutions. Whether countries opted for rising wage inequality (skill premium) or increased unemployment of low-skilled workers, the inequality-unemployment trade-off seems to imply a common increase in the relative demand for high-skilled workers. Two major explanations have been given for this increase, i.e. globalisation (North-South trade) and skill-biased technical change (SBTC) (see Chusseau et al., 2008 for a survey). Rather than resulting from differences in (labour market) institutions, the mixed cross-country evidence may be due to asymmetric effects of globalisation and technical progress. In this line, Hellier and Chusseau (2010) provide a theoretical explanation for the empirical evidence that the IU trade-off is more intense in the European countries that were inequality-oriented at the outset of the recent phase of globalisation. In addition, Chusseau and Hellier (2009) suggest that the IU trade-off is stronger in egalitarian countries when it is driven by technological change.

This paper has two objectives:

1) To check that the inequality-unemployment trade-off does exist and that it differs across countries.

2) To estimate the respective impact of globalisation and technical change on the trade-off, and to verify that the impact depends on the initial orientation of the countries in terms of inequality.

In Section 2 a simple theoretical model that establishes the IU trade-off in relation with globalisation and technical change is proposed. In Section 3 an empirical specification is derived from the model. The estimation procedure, the variables and the data are presented in section 4. The results are provided and discussed in section 5. We conclude in section 6.

2. Globalisation, SBTC and the inequality-unemployment trade-off

2.1. The determinants of unemployment and inequality

Let us consider a Northern (advanced) country i whose technology is modelled with the following CES production function:

$$Y_i = A_i \left(a_i b_i H_i^{\frac{\sigma_i - 1}{\sigma_i}} + (1 - a_i) b_i L_i^{\frac{\sigma_i - 1}{\sigma_i}} + (1 - b_i) K_i^{\frac{\sigma_i - 1}{\sigma_i}} \right)^{\frac{\sigma_i}{\sigma_i - 1}} \qquad (1)$$

Output Y is produced using as factors of production low-skilled labour L, high-skilled labour H and capital K, σ is the elasticity of substitution between factors.

Coefficients A_i, a_i and b_i denote the state of the current technology. In particular, coefficient a_i indicates the place of country i on the skill intensity ladder, i.e. the more a country is specialised in skill-intensive industries, the higher the value of a_i.

Assuming optimizing firms, country i's relative demand for low-skilled labour (L_i / H_i) is:

$$\frac{L_i}{H_i} = \left(\frac{w_i}{\alpha_i} \right)^{\sigma_i}$$

with $w_i \equiv w_{Hi} / w_{Li}$ the skill premium in country i (w_{Hi} and w_{Li} being respectively the unit wage of high-skilled and low-skilled labour in country i) and $\alpha_i \equiv \frac{a_i}{1 - a_i}$ the indicator of skill intensity in country i's production resulting from its specialisation and the state of technology The skill premium w_i is the indicator of country i's inequality.

Unemployment, inequality and skill endowment

It is assumed that the market for high-skilled labour is perfectly competitive, whereas downward flexibility of wages of low-skilled workers is limited, e.g. because of a minimum wage or collective bargaining. This can be represented by full employment in the high-skilled labour market ($H_i = \bar{H}_i$) and an institutionally determined skill premium $w_i = \bar{w}_i$ (see, e.g.

Davis, 1998; Askenazy, 2003; Chusseau and Hellier, 2007, 2008; Hellier and Chusseau, 2010). Introducing these equalities into relation (1) and dividing the obtained expression by the country's endowment of low-skilled labour $\overline{L}_i$ results in:

$$l_i = \left(\overline{w}_i / \alpha_i \right)^{\sigma_i} \overline{h}_i \qquad (2)$$

With $l_i \equiv L_i / \overline{L}_i$ the employment rate of low-skilled workers and $\overline{h}_i \equiv \overline{H}_i / \overline{L}_i$ country i's relative skill endowment.

Finally, since the unemployment rate of low-skilled workers is $u_{Li} = 1 - l_i$, we obtain the following relationship between this unemployment rate and the inequality indicator w_i:

$$u_{Li} = 1 - \left(\overline{w}_i / \alpha_i \right)^{\sigma_i} \overline{h}_i \qquad (3)$$

The lower the skill premium, the higher the unemployment of low-skilled workers. There is thus an inverted relationship between unemployment and inequality: $\dfrac{\partial u_{Li}}{\partial \overline{w}_i} = -\sigma_i \, \dfrac{\overline{w}_i^{\,\sigma_i - 1}}{\alpha_i^{\,\sigma_i}} \, \overline{h}_i < 0$

Institutions

We know from the theoretical and empirical literature that institutions have an impact on both the skill premium and the employment of low-skilled workers. We also know that this impact is rather uneven depending on the considered institution and policy. We consequently modify equation (2) so as to account for the impact of institutions on employment:

$$l_i = G\left(g_i \right) \times \left(\overline{w}_i / \alpha_i \right)^{\sigma_i} \overline{h}_i$$

Where $G\left(g_i \right)$ measures the impact of the vector of country i's institutions $g_i = \left\{ g_{ij} \right\}$. Further assuming that $G\left(g_i \right)$ is log-linear: $G\left(g_i \right) = \prod_j \left(g_{ij} \right)^{\gamma_j}$, the function that determines the employment of low-skilled labours can be rewritten:

$$l_i = \left(\prod_j g_{ij}^{\,\gamma_j} \right) \times \left(\frac{\overline{w}_i}{\alpha_i} \right)^{\sigma_i} \overline{h}_i \qquad (4)$$

Changes in the employment of low-skilled workers

Differentiating (4) yields:

$$\frac{dl_i}{l_i} = \underbrace{\sigma_i \frac{d\overline{w}_i}{\overline{w}_i}}_{\substack{\text{Factor prices}\\\text{Effect}}} - \underbrace{\sigma_i \frac{d\alpha_i}{\alpha_i}}_{\substack{\text{Effect of a change in}\\\text{the skill intensity}}} + \underbrace{\frac{d\overline{h}_i}{\overline{h}_i}}_{\substack{\text{Effect of a change in}\\\text{factor endowments}}} + \underbrace{\sum_j \gamma_j \frac{dg_{ij}}{g_{ij}}}_{\substack{\text{Effect of a change}\\\text{in institutions}}} \qquad (5)$$

A change in the employment rate of the low-skilled can result from:

(i) A change in the skill premium $\overline{w}_i$ that has a positive impact on low-skilled employment;

(ii) A change in the indicator of skill intensity α_i that has a negative impact on low-skilled employment;

(iii) A change in the skill relative endowment $\overline{h}_i$ that has a positive impact on low-skilled employment;

(iv) A change in the country's institutions $\{g_{ij}\}$.

In addition, the higher the elasticity of substitution σ_i, the higher the impact on employment of changes in the skill premium $\overline{w}_i$ and the skill intensity α_i.

It can be noted that changes in capital utilisation or in the coefficient b_i have no impact on $l_i \equiv L_i / \overline{L}_i$. This is because the elasticity of substitution is the same between all factors, and because of the assumption that the possible wage rigidity of low-skilled workers is reflected in the rigidity of the skill premium, and not in rigidity of the wages of low-skilled workers relative to the price of capital.

2.2. Skill intensity, globalisation and technical change

A country's skill intensity indicator α_i may increase because of:

(i) A shift in its specialisation towards more skill intensive industries.

(ii) A change in production technology that raises the coefficient α_i.

In open economies, a change in specialisation is to a large extent induced by a move in trade specialisation. Increasing specialisation in skill-intensive industries is likely to have occurred in the North as a result of globalisation and the ensuing rising share of the South in

international production and trade and the initial focus of Southern countries on the production of low-skill-intensive goods.

On the other hand, an increase in α_i may reflect skill-biased technological change, resulting from a factor bias that increases the relative demand for high-skilled labour, from a sector bias that increases total factor productivity more substantially in the skill-intensive than in the low-skill-intensive industries and/or from the creation of new highly skill-intensive goods that are produced in the country.

If both globalisation and skill-biased technological change result in an increase in α_i, they can however have an uneven impact across countries. Hellier and Chusseau (2010) have shown that globalisation acting on its own, typically results in an inequality-unemployment trade-off that is more intense in those countries that were initially inequality-oriented (high skill premium $\overline{w}_i$). Chusseau and Hellier (2009) came to the conclusion that technological change had the opposite impact (a trade-off that is more intense in initially egalitarian countries) when this takes the form of a pure sector bias and/or the creation of new skill-intensive goods.

2.3. Skill intensity and the inequality-unemployment trade-off

Proposition: *For given institutions $\left\{g_{ij}\right\}$ and factor endowment $\overline{h}_i$, a rise in a country's skill intensity α_i creates an inequality-unemployment trade-off, which intensifies as α_i increases.*

Proof: We assume an increase in country i' s coefficient α_i. Equation (5) can be rewritten:

$d\alpha_i / \alpha_i = d\overline{w}_i / \overline{w}_i - \sigma_i^{-1} dl_i / l_i + \sigma_i^{-1} d\overline{h}_i / \overline{h}_i + \sum_j \gamma_j dg_{ij} / g_{ij}$. The factor endowment and institutions being given ($d\overline{h}_i = 0$; $dg_{ij} = 0$), equation (4) shows that a rise $d\alpha_i > 0$ must be offset by a decrease in the employment rate of the low-skilled ($dl_i < 0$) and/or by an increase in the skill premium ($d\overline{w}_i > 0$).

A change in α_i measures the intensity of the I-U trade-off that results from globalisation and technical change.

3. The empirical specification

We have two major objectives:

1. To test the existence of the IUT and to verify whether its intensity differs across countries.

2. To estimate the impact of globalisation and technical change on the trade-off and to assess whether these two factors can explain the different IUT intensity across countries. In this respect, we expect globalisation to induce a higher trade-off in the countries that were inequality-oriented on the eve of the recent globalisation phase, whereas the trade-off intensity due to technical change is expected to be higher in initially egalitarian countries.

3.1. Comparing the inequality-unemployment trade-off across countries

By transforming equation (4) into logarithm and differentiating, we obtain:

$$\hat{l}_i = \sigma_i \hat{w}_i + \hat{h}_i + \sum_j \gamma_j \hat{g}_{ij} + \hat{b}_i \tag{6}$$

with $\hat{l}_i = d(\ln l_i)$, $\hat{w}_i = d(\ln \overline{w}_i)$, $\hat{h}_i = d(\ln \overline{h}_i)$, $\hat{g}_{ij} = d(\ln g_{ij})$ and $\hat{b}_i = -\sigma_i d(\ln \alpha_i) < 0$.

In, equation (6), $\hat{l}_i = d(\ln l_i)$ depends on $d(\ln \alpha_i)$, and thus on $\hat{b}_i$, that is not observed and measures the intensity of the I-U trade-off in country i that stems from both globalisation and SBTC.

Relation (6) can also be written as:

$$\hat{l}_i = \sigma_i \hat{w}_i + \hat{h}_i + \sum_j \gamma_j \hat{g}_{ij} + \hat{s}_i + \hat{c} \tag{7}$$

Where $\hat{c}$ depicts the trade-off common to all countries, and $\hat{s}_i$ the trade-off specific to each country ($\hat{b}_i = \hat{s}_i + \hat{c}$).

3.2. Estimating the impact of globalisation and technological change

We assume that globalisation consists in emerging economies from the South entering an increasing number of industries, starting from the less skill-intensive sectors and gradually climbing up the skill intensity ladder. As a consequence, globalisation is perceived as a

process that is common to all Northern countries though its impact on the Northern countries can be asymmetric. In particular, differences in countries' openness result from differences in country size and differences in their comparative advantage. In addition, differences in comparative advantage determine the specialisation of countries and thereby to a large extent explain the uneven impact of globalisation across Northern countries. This is because the Northern countries that were initially specialised in low-skill-intensive industries are more sensitive to competition from the South.

On the other hand, technological change is generally believed to have had a different impact on Northern countries for two major reasons: (i) the speed at which technological change, particularly ICT, has been adopted varies across countries, and (ii) the sectors have been unevenly affected by innovation, which in return results in divergence across countries because of their differences in specialisation. If the first reason can be seen as temporary, the second induces lasting and sometimes permanent differences across countries. In addition, the effects of the same type of technological change (e.g. computerisation or automation) may differ across industries (e.g. depend on skill intensity). The same type of technical progress could therefore result in different effects on the employment of the low-skilled, countries' specialisation in production being an important driving factor for these differences.

We shall consequently assume:

1) That the globalisation process is common to all countries but possibly with asymmetric effects.

2) That technological change differs across countries and that the same type of technological change may have a different impact across countries.

Under these assumptions, country i's trade-off $\hat{b}_i$ can be written as:

$$\hat{b}_i = a_{xi}\hat{x} + a_{\theta i}\hat{\theta}_i + \hat{c} \tag{8}$$

where $\hat{x}$ is the indicator of the (rate of) variation in globalisation, $\hat{\theta}_i$ the indicator of the (rate of) variation of country i's specific technological change. Thus, a_{xi} measures the impact of globalisation specific to country i and $a_{\theta i}$ the country-specific impact of technical change.

By inserting (8) into (7), we obtain:

$$\hat{l}_i = \sigma_i\hat{w}_i + \hat{h}_i + \sum_j \gamma_j\hat{g}_{ij} + a_{xi}\hat{x} + a_{\theta i}\hat{\theta}_i + \hat{c} \tag{9}$$

Or using a more flexible form for the production function:

$$\hat{l}_i = a_w \hat{w}_i + a_h \hat{h}_i + \sum_j \gamma_j \hat{g}_{ij} + \sum_i a_{xi} \hat{x} + \sum_i a_{\theta i} \hat{\theta}_i + a_k \hat{k}_i + a_r \hat{r}_i + \hat{c} \qquad (9')$$

In equation (9'), $\hat{k}_i$ represents the change in the capital-output ratio $k_i \equiv K_i / Y_i$ that may affect the demand for low-skilled workers and $\hat{r}$ is the rate of variation of the real price of capital. We expect $a_w \succ 0, a_h \succ 0, a_{xi} \prec 0, a_{\theta i} \prec 0,$ and $-a_{xi} \succ -a_{xj}, -a_{\theta i} \prec -a_{\theta j}$ if country i is initially more inequality-oriented than country j.

4   Data and estimation procedure

When the usual error term is added to the specification that can be derived from the proposed model, e.g. (9'), the following econometric equation can be estimated to verify the propositions:

$$\hat{l}_{it} = a_w \hat{w}_{it} + a_h \hat{h}_{it} + \sum_j \gamma_j \hat{g}_{ijt} + \sum_i a_{xi} \hat{x}_t + \sum_i a_{\theta i} \hat{\theta}_{it} + a_k \hat{k}_{it} + a_r \hat{r}_{it} + \varepsilon_{it} \qquad (10)$$

Table 1: Definition of variables and data sources

Variables	Definition	Sources
l_i	Logarithm of the employment rate of the low skilled workers $L_i / \bar{L}_i$	OECD Labour Force Statistics; U.S. Bureau of Labor Statistics International comparisons of annual labor force statistics and EUKLEMS database
w_i	Logarithm of the skill premium: Ratio of the wages of high-skilled workers to the wages of medium- and low-skilled workers	EUKLEMS database
h_i	Logarithm of the relative skill endowment $\bar{H}_i / \bar{L}_i$: Share of high-skilled workers in total hours worked	EUKLEMS database
x_i	Indicator of globalisation: Share in world exports of newly industrialized Asian economies + Emerging and developing economies.	IMF (2008), World Economic Outlook Database

	Indicator of technical change:	
θi	- Share of ICT capital compensation in total capital compensation.	EUKLEMS database
	- Gross expenditures on R&D as percentage of GDP.	OECD Main Science and Technology Indicators
gij	Institutional variables: - Average unemployment benefit replacement rate. - Tax wedge National Accounts. - Union density. - Product market regulation indicator - Output gap.	Bassanini, A. and R. Duval (2006), Employment Patterns in OECD countries: Reassessing the role of policies and institutions, OECD Economics Department Working Paper No. 486
k_i	Capital output ratio (K_i / Y_i)	EUKLEMS database
ri	Unit capital cost	EUKLEMS database

The specification is estimated for a panel of thirteen countries: Austria, Belgium, Denmark, Germany, Finland, France, Italy, Japan, The Netherlands, Spain, Sweden, UK and US for the period 1981-2003. The different variables and data sources are summarized in table 1.

Some of the institutional variables from Bassanini and Duval (2006), such as the indicator of employment protection legislation, could not be used as they hardly changed over the period considered and are therefore almost perfectly collinear to the time invariant country effects (fixed effects).

5   Results

The results of the estimation of specification (10) for the panel of countries are reported in table 2. Two alternative indicators of technical change are considered. In the second and third column the results are reported for a specification in which R&D expenditures as a percentage of GDP is included and in the final two columns the results are reported for an estimation using the share of ICT capital compensation in total capital compensation to proxy technical change.

The F-tests indicate that a fixed effects specification is preferred to a plain OLS specification and the Hausman tests suggest that fixed effects is more appropriate than a random effects specification.

The coefficients of the skill premium and relative skill endowment are positive as expected. The high correlation between both variables may explain the fact that the coefficients are not statistically significant. The negative impact of capital intensity and the positive impact of capital cost on the employment rate of low-skilled workers seems to indicate, in line with previous studies (e.g. Hamermesh, 1993; Falk and Koebel, 1997 and Krusell et al., 2000), that capital substitutes for low-skilled labour. The impact of the tax wedge on the employment rate is found to be significantly negative and the impact of union density significantly positive. The effect of the replacement rate does not appear to be significant and the impact of product market regulation is only significant in the ICT specification. The coefficient of the output gap is positive as expected and statistically significant.

Table 2: Results of a panel estimation (Thirteen OECD countries, 1981-2003)

Variables	R&D		ICT	
	Coefficient	Standard errors	Coefficient	Standard errors
w_i	0.064	0.062	0.089	0.057
h_i	0.021	0.031	0.056	0.032*
k	-0.205	0.061***	-0.149	0.053***
r_i	0.187	0.050***	0.137	0.045***
X_{AU}	0.004	0.544	0.611	0.891
X_{BE}	0.064	0.311	0.157	0.309
X_{DE}	0.392	0.619	0.365	0.585
X_{DK}	-0.388	0.305	-0.594	0.287**
X_{ES}	-0.766	0.306**	-0.702	0.281***
X_{FI}	-0.343	0.318	-0.151	0.302
X_{FR}	0.079	0.295	0.178	0.280
X_{IT}	0.346	0.348	0.196	0.307
X_{JP}	0.006	0.325	-0.077	0.289
X_{NL}	0.370	0.323	0.481	0.311
X_{SE}	0.316	0.318	-0.195	0.466
X_{UK}	-0.670	0.304**	-0.503	0.286
X_{US}	0.074	0.311	0.188	0.315
θ_{AU}	-0.001	0.073	4.355	5.469
θ_{BE}	0.010	0.028	2.176	1.321
θ_{DE}	0.022	0.027	-5.547	4.576
θ_{DK}	0.138	0.045***	-1.144	0.650**
θ_{ES}	0.043	0.038	-6.264	1.627***
θ_{FI}	-0.026	0.018	-1.625	1.105
θ_{FR}	0.046	0.029	1.719	1.849
θ_{IT}	0.011	0.034	1.014	2.246
θ_{JP}	0.007	0.021	0.950	1.322
θ_{NL}	0.018	0.019	0.164	2.018

θ_{SE}	-0.032	0.014**	-1.317	1.654
θ_{UK}	-0.006	0.032	-1.793	0.811*
θ_{US}	0.007	0.020	1.643	1.548
Replacement rate	0.000	0.000	0.000	0.000
Tax wedge	-0.001	0.000***	-0.001	0.000***
Union density	0.000	0.000**	0.000	0.000*
Market regulation	0.000	0.001	-0.001	0.001**
Output gap	0.002	0.000***	0.002	0.000***
adjusted R-squared	0.93		0.94	
F-test OLS vs. FE	85.32 (0.00)***		92.91 (0.00)***	
Hausman-test RE vs. FE	38.51 (0.00)***		33.74 (0.00)***	

Note: The table reports the results of a fixed effects estimation, which as the F-test and Hausman test show is preferred to a pooled OLS and random effects specification. *, **, *** denotes statistical significance at 10%, 5% and 1% respectively.

Considering the coefficients of interest, i.e. the country-specific coefficients of the globalisation variable, in both alternative specifications only two coefficients are statistically significant, for Spain and the UK in the R&D specification and for Denmark and Spain in the ICT specification. The significant coefficients have all the expected negative sign.

Abstracting from statistical significance, figure 1 maps the country-specific globalisation coefficients against the skill premium in 1980.

Figure 1: Link between initial inequality (1980) and globalisation coefficient
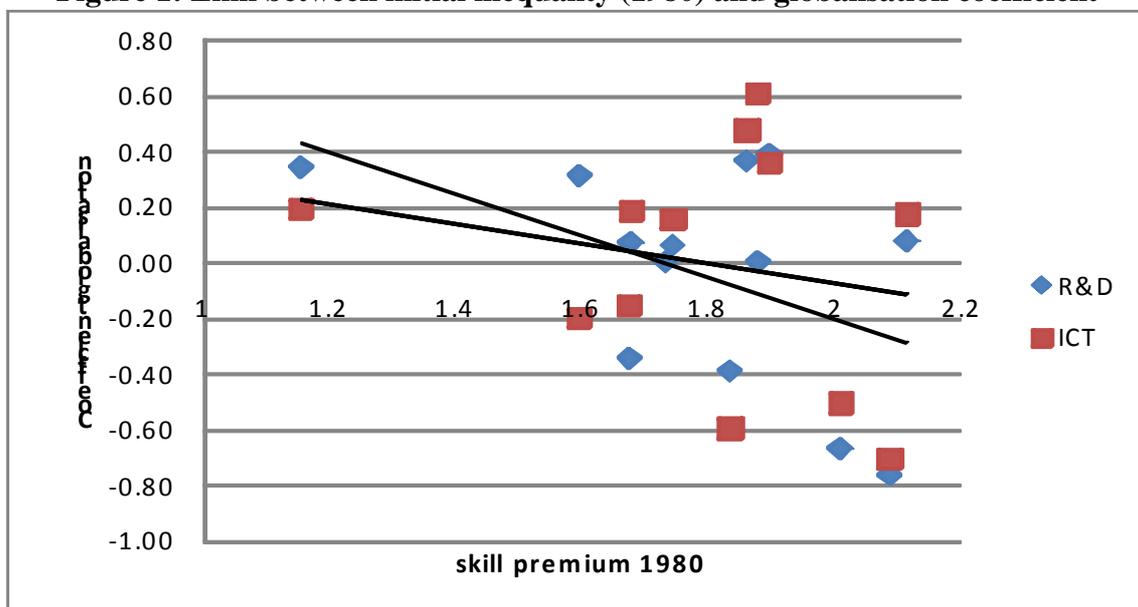
For both alternative specifications the relationship is negative, in line with assumption that follows from Hellier and Chusseau (2010). The correlation for the specification using R&D expenditures to proxy technological change is -0.48 which is statistically significant at the 5%

level (directional). The correlation for the specification using ICT intensity is -0.21, which is not significant.

Figure 2 maps the country-specific coefficients of technological change, proxied by R&D expenditures as a percentage of GDP, against the skill premium in 1980 and figure 3 shows the same relationship for the specification with the share of ICT in total capital compensation as proxy for technological change. The correlation in figure 2 is 0.39, significant at 10% (directional) and the correlation in figure 3 is -0.28, which is not significant. The significant positive correlation supports the conclusion of Chusseau and Hellier (2009) that the trade-off between unemployment and inequality is more intense in initially egalitarian countries when technological change is purely sector-biased and/or implies the creation of new skill intensive goods.

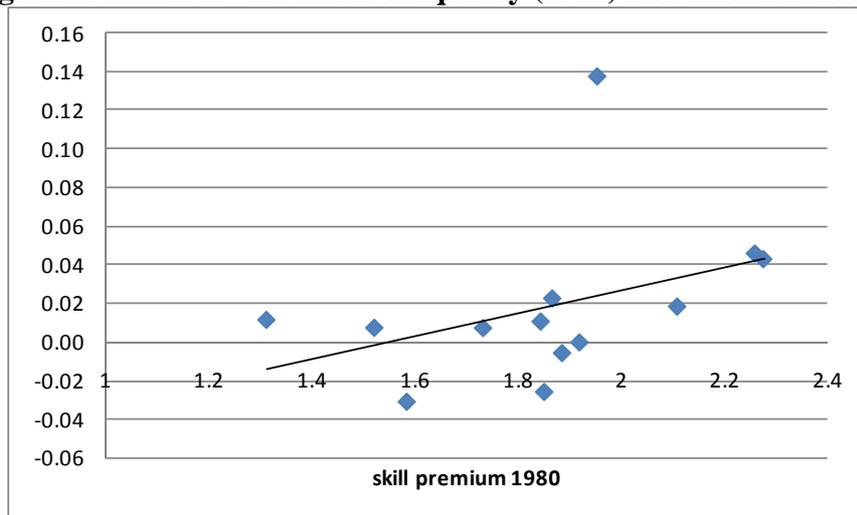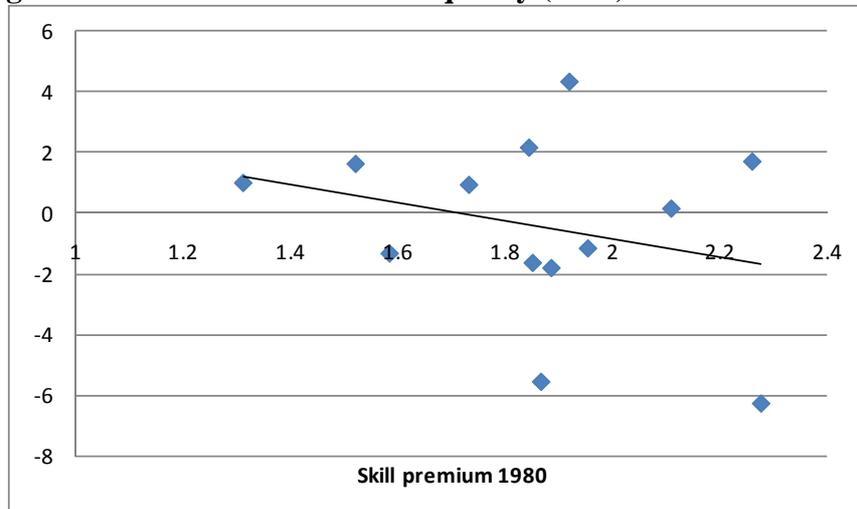**Figure 2: Link between initial inequality (1980) and coefficient R&D**

Figure 3: Link between initial inequality (1980) and coefficient ICT

6   Conclusions

The divergence in recent decades in changes in unemployment and inequality, between Anglo-Saxon countries and Continental Europe, has been interpreted as revealing a trade-off between unemployment (mainly of low-skilled workers) and wage inequality (rising skill premium) that resulted from a growing demand for skilled workers.

Though some studies lend support to the existence of such a trade-off, empirical evidence is not overwhelming. A potential problem with the trade-off assumption is that data do not permit to neatly classify all countries into two distinct groups in terms of different choices with regard to a common trade-off, i.e. Anglo-Saxon countries (low unemployment- sharp increase in inequality), some Scandinavian countries (relatively low unemployment and low inequality), some Continental European countries (Belgium, France and Germany) combining relatively low inequality with rather high unemployment and some Southern European countries having witnessed high inequality as well as substantial unemployment.

In this paper a proposition is derived from a theoretical model, which links the intensity of the inequality-unemployment trade-off (IUT) to the skill intensity of production. The latter is in its turn linked to the rising competition of emerging low-skill-abundant countries and to technological change.

Following Hellier and Chusseau (2010), globalisation is assumed to result in an inequality-unemployment trade-off that is more intense in those countries that were initially inequality-oriented whereas in line with conclusions of Chusseau and Hellier (2009) the trade-off is assumed to be more intense in initially egalitarian countries if technological change is purely sector-biased and/or is reflected in the creation of new skill-intensive goods.

Estimation on a panel of thirteen OECD countries for the period 1981-2003 provides some support for the propositions of a negative link between initial wage inequality and the impact of globalisation and a positive link between initial inequality and technological change.

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