

The Political Economy of Flexicurity

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Abstract

We document the presence of a trade-off between unemployment benefits (UB) and employment protection legislation (EPL) in the provision of insurance against labor market risk. Different countries' locations along this trade-off represent stable, hard to modify, politico-economic equilibria. We develop a model in which individuals determine the strictness of EPL and the size of a redistributive UB system in two distinct political environments. Agents are heterogeneous along two dimensions: employment status – insiders and outsiders – and skills – low and high. Unlike previous work on EPL, we model employment protection as an institution redistributing also among insiders, notably in favour of the low-skill workers. A key implication of the model is that flexicurity configurations with low EPL and high UB should emerge in presence of dispersed wage structures and progressive UB systems. Micro data on wage dispersion display correlations consistent with our results. The analysis of the experience of EPL reformers yields results which are in line with the relation between EPL and progressiveness of the UB system implied by our model.

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1. Introduction

Unemployment benefits (UBs) and employment protection legislation (EPL) protect individuals against the risks of job loss. Yet, while EPL protects those who already have a job, and does not tax the worker, UBs transfer income to the unemployed and are funded by taxes imposed on labor income. Across OECD countries there is a large variation in the use of EPL and UBs. Plotted against each other, various measures of the two institutions point to a trade-off between EPL and UBs: countries adopting strict EPL display smaller UB programs, and viceversa. “Flexicurity” countries adopt instead a combination of flexible labor market and large income security for the unemployed, by choosing low EPL and generous UBs.

Countries’ locations along this trade-off correspond to stable political-economic equilibria. Reforms of EPL are mostly marginal: they are confined to introducing “at the margin” more flexible contractual types, rather than modifying rules for workers who already have a permanent contract. Saving on fiscal cost of flexicurity is also proving very difficult: UB systems are adjusted by modifying enforcement rules (e.g., via activation schemes) rather than statutory replacement rates or the maximum duration of benefits. All this points to strong political opposition to reforms.

Why do different countries resort to alternative combinations of employment protection and unemployment insurance to protect individuals against the risk of being unemployed? Why is it so uncommon to reform these institutional configurations?

This paper provides a political-economic explanation of the observed trade-off between EPL and UBs, and of the cross-country variation in the use of the two policy instruments applying for the first time (to our knowledge) a multidimensional voting approach to endogenous labor market institutions theory. Our model bridges the gap between two streams of literature in the political economy of labor markets. On the one hand, our environment is similar to that proposed by Wright (1986) to examine UBs. On the other hand, it draws on Saint-Paul (1996, 1999a, 1999b and 2000) in modeling

choices over EPL.

Unlike Wright and Saint-Paul, we model EPL and UBs as multidimensional institutions operating redistributions not only between insiders to outsiders, but also between high and low-skill types. Hence, we introduce two conflicts of interest in our model. The first conflict arises in the transition between employment and unemployment: unemployment inflow and outflow rates are affected by the strictness of EPL. The second conflict occurs because both EPL and UBs operate – possibly at different degrees – some redistribution across skills.

In our political economy model, individuals decide the strictness of EPL and the size of UBs. Because of the multidimensionality of the issue space, the existence of a Condorcet winner of the majority voting game is not guaranteed. To solve this shortcoming, we analyze two alternative political systems. First, in a direct democracy environment, we concentrate on political equilibria induced by institutional restrictions, or structure-induced equilibria (see Shepsle, 1979 and Persson and Tabellini, 2000). In this political system, the entire electorate votes simultaneously over the payroll tax financing unemployment benefits (hence over the size of UBs), and over the strictness of EPL; policy decisions are taken issue-by-issue. Although the median voter over each policy is typically – under reasonable specifications – a low-skill individual, high-skill types can still “vote with their feet”, by adjusting their labor supply in response to the tax financing the UB system. Hence, changes in the distribution of the population by skill level affect the UB/EPL policy mix via economic channels even when the identity of the pivotal political player does not change. We also analyze these redistributive issues in a representative democracy, in which voters choose between two parties or coalitions according to their policy platforms. Each party appeals to its own electorate, and within party decisions over the economic policy require unanimity, according to the party unanimity Nash equilibrium defined by Roemer (1999).

We show that flexicurity configurations with relatively low EPL and high UB emerge

when wage differentials between high and low-skill types are sufficiently large or when unemployment benefits are strongly progressive, so that large redistributive transfers may take place via a generous UB system. Our model thus implies that countries with compressed wage structures have stricter EPL and that configurations with less EPL should be associated with stronger progressiveness in the design of UBs. The latter implication may represent a “possibility theorem” for Governments wishing to adopt flexicurity configurations: more flexibility may be introduced in the labor market, if UB systems are made more progressive. Also the fiscal costs of flexicurity can be reduced by concentrating UB generosity on the low-skill types.

Our empirical strategy offers tests of these implications of the model. We document that wage structures allowing for larger premia on education (and also higher unconditional wage dispersion) are associated with flexicurity configurations, i.e., more UBs and less EPL. We also look at the policy experiments carried out in OECD countries in the 1990s and show that countries reforming EPL have also reformed UBs in the direction implied by our model.

The paper proceeds as follows: Section 2 documents the trade-off, characterizes the multidimensional conflicts involved by UBs and EPL and reviews the related literature. Section 3 presents the model and the economic environment. Section 4 develops the political system, and introduces the equilibrium concept. In section 5, we bring the model’s main assumptions and results to the data, and we conclude.

2. The UB/EPL trade-off

The theoretical literature acknowledging a welfare-enhancing role to labor market institutions suggests that UBs may be a close substitute for EPL. Both EPL and UB protect workers against uninsurable labor market risk. When severance payments and notice periods in case of dismissals are chosen optimally to maximize welfare of risk-averse agents, there is no role for unemployment insurance (Pissarides, 2001). These

two institutions have also important design features in common. An experience-rated unemployment insurance scheme involves the same type (and possibly amount) of transfers from the employer to the employee than a severance pay or a statutory notice period in the event of a dismissal. The only difference is that EPL would be paid in one installment, while UBs are generally provided throughout the unemployment spell up to their maximum duration. The reform of the French unemployment benefit system recently advocated by Blanchard and Tirole (2003) exploits this substitutability between EPL and UBs: it involves an increase in the degree of experience-rating of the UB system, which confines EPL to a one-off monetary compensation for the job loss.

Figure 1 documents the aggregate trade-off between UB and EPL over OECD countries, for which we had comparable data on both institutional features. It displays, on the horizontal axis, an index of the strictness of employment protection for *regular* contracts¹ compiled by the OECD (OECD, 1999) on the basis of an assessment of national legislations. The vertical axis displays a summary measure of the generosity of unemployment benefits, namely the coverage of UBs (the fraction of unemployed receiving UBs) multiplied by the average gross replacement rate in the first-year of receipt of benefits.

Both EPL and UB measures are normalized in the 0-1 range. Higher values denote stricter EPL and more generous UBs. Most countries are located in the first and in the third quadrant of Figure 1, pointing to an inverse relationship between UB and EPL. The two relevant exceptions are the US and the UK, which display less UBs and EPL than a typical OECD country. The pairwise correlation of the two institutional features is -0.39 , which is statistically significant at 95 percent confidence levels².

¹The OECD *overall* EPL index combines information on “regular” and “temporary” contracts. Less EPL on the latter contracts (fixed-term contracts, temporary work agency, etc.) provides greater “flexibility at the margin” (more leverage in hiring via temporary contracts), which can actually insulate regular workers from labor market risk, by creating a “buffer stock” of flexible workers, who can be dismissed at low-cost in case of adverse shocks (Bentolila and Dolado, 1994; Boeri and Garibaldi, 2006).

²The US is an outlier in this context as it displays low levels of both, EPL and UBs, by international standards. OECD statistics on UBs however fail to capture many US state programmes which are

As first time job-seekers typically do not qualify for UBs, a low coverage of UBs may be associated with high youth unemployment rates, which tend to be positively correlated with EPL. However, the negative correlation between UB and EPL is *stronger* when concentrating on central age groups (Table 1), whose unemployment rate is uncorrelated with EPL (OECD, 1999). The negative correlation between UBs and EPL holds also when measuring UB generosity only in terms of replacement rates ³ (second row of Table 1).

This trade-off holds also at the micro level. Boeri, Börsch-Supan and Tabellini (2001) found that individuals, who feel protected by EPL, are less willing to purchase state-provided unemployment insurance; Ichino et al. (2003) found that judges are more favorable to workers (effectively making EPL stricter) when unemployment benefits are lower.

Moving up along the EPL-UB trade-off toward flexicurity configurations is proving extremely difficult for Governments. An inventory of reforms in this field (available at www.frdb.org) suggests that 93 out of 112 reforms of EPL carried out in the period 1986-2002 in Europe have been parametric, involving mainly the introduction of new contractual types “at the margin”, that is, limited to new hires. This is confirmed by the updating of the OECD index of the strictness of employment protection for regular workers: only four countries (Korea, Finland, Spain and Greece) out of 28 reduced the strictness of EPL for regular workers throughout the 1987-2003 period. It is also proving difficult for countries to reduce the generosity of UB systems towards configurations with lower fiscal costs. The location of the different countries along the EPL-UB trade-off

targeted to the poor, such as the TANF (Temporary Assistance for Needy Families), and for the extension of the maximum duration of benefits in states hit by regional shocks. The generosity and the progressiveness of the US UB system would be larger when accounting for these state programmes. In a companion study (Boeri, Conde-Ruiz and Galasso, 2004) we also show, either theoretically and empirically, that larger capital markets reduce the demand for EPL and UBs, by providing to workers alternative insurance against shocks to their labor incomes. This may also explain the US configuration.

³Buti, Pench and Sestito (1998) also found a negative pairwise correlation between UB replacement rates and EPL strictness.

thus seems to represent a stable politico-economic equilibrium.⁴

2.1. Vertical redistribution operated by UBs and EPL

Political-economic models of EPL and UB (Saint-Paul, 1999a, 1999b and 2000; Wright, 1986) describe a one-dimensional distributional conflict between insiders and outsiders. However, both EPL and UBs may involve multidimensional conflicts. In fact, in addition to redistributing across the employment margins, EPL and UBs redistribute also across earning levels.

EPL unavoidably involves some fixed-cost, such as those associated with procedural obligations of employers vis-a-vis labor inspectors and unions. These fixed costs explain most (up to 85%) of the cross-sectional variation in the aggregate EPL OECD index, compared with roughly 40% explained by the pure transfer and earning-related (statutory severance pay and advance notice) component of EPL. More importantly, it is just these fixed (or progressive) components of EPL which are found to have a stronger impact on unemployment inflows (OECD, 1999; Bertola, Boeri and Cazes, 2000). This is consistent with economic theory: as suggested by Lazear (1990), EPL regulations involving just transfers from employers to employees can be undone by bonding wage contracts, provided that wages are sufficiently flexible and workers are risk-neutral. Judges are also typically more protective of unskilled workers with low re-employment probabilities (Ichino et al., 2003; Marinescu, 2005), as if they were maximizing the joint welfare of the dismissed worker and the firm, tailoring firing costs to individual economic circumstances.

These asymmetric effects of EPL across earnings-skill levels are documented in Figure 2, which displays proxy quarterly job loss rates (defined as persons who are currently unemployed and who have been dismissed by their employer in the previous 3 months, as a proportion of dependent employment) by level of education, drawing on longitu-

⁴Algan and Cahuc (2006) analyse the impact of civic attitudes on the feasibility of a flexicurity configuration.

dinal data from the European Commission Household Panel (ECHP), plotted against the OECD EPL index for regular workers. As shown by the second-degree polynomial fitted into the scatterplot, unemployment inflows are less responsive to changes in the strictness of EPL in the case of the high-skill types.

Net replacement rates (NRR) of UBs are almost everywhere decreasing with earnings, as a result of benefit floors and ceilings or explicit rules reducing the indexation of benefits to wages at higher earning levels. As a measure of progressiveness in the design of UBs, table 2 displays the ratio of the replacement rates at the three earning levels, respectively 2/3, 100 and 150 per cent of the wage of the average production worker. For most countries the ratio is significantly greater than one, for some it is close to 2 pointing to strong progressiveness in the design of UBs. Moreover, UBs also redistribute through the higher incidence and duration of unemployment at low skill levels.

Overall, vertical redistribution operated by EPL and UB is rather substantial.

3. A Political-Economic Model

3.1. The environment

In our economy, agents are infinitely long lived. In every period, they consume their current income, since, as in Wright (1986), we assume that no saving technology is available⁵. Preferences are defined over the infinite stream of consumption, c , and leisure, $1 - l$, where l represents labor, through a utility function, $\sum_{k=t}^{\infty} \beta^{k-t} v(c_k, l_k)$, with β representing the subjective discount factor. The instant utility function is assumed to be log-linear $v(c, l) = c + \gamma \ln(1 - l)$, and γ is a parameter measuring the relative importance of leisure.

Agents may be of low or high skill type, l or h . The fraction of the type- j workers in the population is indicated by ρ^j . Clearly, $\rho^h + \rho^l = 1$, and we consider that there are

⁵This assumption greatly simplifies the analysis, without affecting our conclusions. The fact that agents are not allowed to self-insure against negative labor market shocks through private savings does not affect the redistributive motive driving our results.

more low than high skill types, $\rho^l > \rho^h$. Low and high skill agents are assumed to differ along several dimensions. When employed, low skill workers earn a pre-tax real wage equal to w^l , whereas high skill workers earn $w^h = (1 + A)w^l$, with $A > 0$ representing the wage differential; moreover the labor supply of the unskilled is rigid and normalized to $l^l = \bar{l} < 1$. High skilled instead determine their labor supply, l^h , by maximizing their utility when employed, that is, $w^h l^h (1 - \tau) + \gamma \ln(1 - l^h)$, where τ represents a proportional tax on labor income levied to finance an unemployment benefit system. Labor supply of the high-skill types is then: $l^h = 1 - \gamma/w^h (1 - \tau)$, which is non negative for $\tau \leq \tau_A = 1 - \gamma/w^h$.

In every period, agents may be either employed (insider) or unemployed (outsider). The transition between the two states is regulated by a Markov process, with skill-specific transition probabilities. In particular, $F^j \in (0, 1)$ is the probability that a type- j employed worker becomes unemployed (the unemployment inflow rate); and $H^j \in (0, 1)$ is the probability that a type- j unemployed worker finds a job (the unemployment outflow rate). Our analysis concentrates on steady states. Thus, for each group of agents the unemployment rate is $u^j = F^j / (H^j + F^j)$, while the total unemployment rate is $u = u^l \rho^l + u^h \rho^h$. Clearly, we have that $\partial u^j / \partial F^j \geq 0$ and $\partial u^j / \partial H^j \leq 0$. Moreover, stability conditions for the unemployment rate require that $F^j < H^j \forall j$.

3.2. Labor Market Institutions

We consider two types of labor market institutions: i) an unemployment benefit system, which in every period taxes the labor income of the workers and provides a transfer to the unemployed; and ii) an employment protection legislation, which affects unemployment inflow (and outflow) rates.

Unemployment Benefits (τ) Our insurance program imposes a proportional tax, τ , on labor income and awards to any type- j unemployed agent a transfer, b^j . We allow for the UB scheme to entail some redistribution, from high to low skills individuals, and

parametrize the degree of redistribution with $0 \leq \phi \leq 1$.

For every type of agent, the UB depends on the tax rate, which defines the amount of resources channeled to the UB scheme, on the unemployment rate, on the relative share of each type in the population, on their labor income, and on the degree of redistribution between the two types of unemployed individuals, according to the following expressions:

$$\begin{aligned} b^l &= \tau \frac{w^l l^l (1 - u^l)}{u^l} + \tau \phi \frac{l^h w^h \rho_h (1 - u^h)}{u^l \rho_l} \\ b^h &= \tau (1 - \phi) \frac{l^h w^h (1 - u^h)}{u^h} \end{aligned} \quad (3.1)$$

For $\phi = 0$, the UBs for the two types are completely isolated, and the generosity of each system depends on the skill-specific unemployment rate, as in a pure insurance scheme, which takes into account the different probabilities of being unemployed of high and low-skill types; for $\phi > 0$, some redistribution takes place from high to low skilled individuals.

Finally, the system is assumed to be budget balanced and thus the total amount of transfers to the unemployed equals total contributions:

$$b^l u^l \rho^l + b^h u^h \rho^h = \tau \left[l^l w^l \rho^l (1 - u^l) + l^h w^h \rho^h (1 - u^h) \right].$$

Employment Protection Legislation (*s*) Labor markets may be regulated by norms protecting workers against the risk of job loss. As discussed above, economic theory and empirical evidence suggest that it is mainly red-tape and procedural costs which affect labor market flows⁶. These costs are fixed (hence protect more low-skill workers) and deadweight from the standpoint of the employment relationship (hence cannot be replaced by experience-rated UBs). Accordingly, we model EPL as protect-

⁶When EPL is confined to severance pay regimes, it can be replicated by any experience-rated unemployment benefit. This makes the UB-EPL substitutability rather uninteresting in that case. In the model below we indeed focus on the red tape component of EPL.

ing only the low-skill workers, and disregard the existence of pure transfers such as mandatory severance payments.

In our model, the degree of EPL is measured by a parameter $s \in [0, 1]$, where $s = 0$ means no protection and $s = 1$ denotes maximum protection. As in Saint-Paul (1996 and 2000), we concentrate on the effects of EPL on unemployment inflow and outflow rates, a relationship on which there is little ambiguity in the empirical⁷ and theoretical literature. Consider the low skill types. A higher degree of EPL decreases the unemployment inflow rate, $\partial F^l / \partial s = F_s^l \leq 0$. Consistently with empirical evidence reviewed in section 2, we assume that this effect is larger when the labor market is flexible ($s \simeq 0$) than under strict EPL⁸, i.e., $\partial^2 F^l / \partial s^2 = F_{ss}^l > 0$.

Also the unemployment outflow rate is negatively affected by the strictness of EPL, $\partial H^l / \partial s = H_s^l < 0$, in accordance with empirical evidence (OECD, 1999) and with economic theory (e.g., Bentolila and Bertola, 1990) predicting that in rigid labor markets employers hire less workers in upturns in order to reduce costs of dismissals during downturns. Figure 3 summarizes the behavior of the low skill inflow and outflow rates as a function of the strictness of EPL. Notice that a trade-off arises since more EPL decreases the unemployment inflow of low skill types, while reducing their outflow. The overall effect on the unemployment rate is therefore ambiguous, as in standard equilibrium models of the labor market (Mortensen and Pissarides, 2001). Provided that unemployment inflows are negative and convex in EPL, while unemployment outflows are linear (declining) in EPL, we expect unemployment to be decreasing for low levels of employment protection (as the effect on the inflow side dominates) and increasing for larger values of s (as the effect on the outflow side becomes relatively more important).

⁷See OECD (1999 and 2004) and Boeri (1999).

⁸It can be shown (results can be provided upon request by the authors) that Mortensen and Pissarides' (2001) equilibrium search model also yields a convexity of the reservation productivity (hence unemployment inflows) in EPL, provided that the matching function is specialised as a Cobb-Douglas. This model also implies a negative effect of EPL on unemployment inflows *and* outflows. In the case of outflows, however, it is not possible to establish a priori the sign of the second derivative.

This assumption, which is standard in literature (see Persson and Tabellini, 2000), is consistent with empirical evidence and delivers an interior minimum at \hat{s}^l .

Finally, EPL leaves the high-skill types unaffected, i.e., F^h and H^h are constant⁹. Moreover, consistently with a large body of empirical evidence on hazards across employment and unemployment margins, we assume that the unemployment inflow rate is always higher for the low than for the high skill workers¹⁰, i.e. $F^l(s) \geq F^h \forall s$, and that, for any degree of EPL, the unemployment outflow rate of the high skill workers is higher than the outflow rate of the low skill ones ($H^l(s) \leq H^h \forall s$).

3.3. Individual Preferences

As in Wright (1986) and Pissarides (2001), in our model individuals cannot save to insure against the unemployment risk. Thus, in every period, consumption is entirely determined by the employment status of the individuals: if employed, they consume $(1 - \tau) w^j l^j$; if unemployed, they consume b^j . Denote by Δ^l the difference in utility between the two labor market states for the low skill agents, i.e., $\Delta^l = (1 - \tau) w^l \bar{l} + \gamma \ln(1 - \bar{l}) - b^l$. Define as τ_B the tax rate that makes the low-skill type indifferent between being employed or unemployed. The labor incentive constraint then requires $\tau \leq \tau_B(s)$.

We can now characterize the indirect utility function with respect to EPL and UB. The expected lifetime utility of a type- j agent who is currently in state i , is given by:

$$V_i^j(s, \tau) = \frac{(1 - \theta_i^j(s, \tau)) ((1 - \tau) w^j l^j + \gamma \ln(1 - l^j)) + \theta_i^j(s, \tau) b^j}{(1 - \beta)} \quad (3.2)$$

⁹In a companion paper (see Boeri, Conde-Ruiz and Galasso, 2003), we show that our results hold also in an environment in which high skill agents do become unemployed, and EPL affects their inflow and outflow rates, provided that unemployment flows are less responsive for the high-skill types than for the low-skill individuals and that low-income insiders constitute a majority of the voters.

¹⁰This assumption mainly captures the difference in the job-to-job reallocation between low and high ability types. In fact, high ability types tend to have more job-to-job mobility and a lower unemployment inflow rate than the low-ability types. Additionally, high-ability workers have more firm specific human capital, which reduces incentives of employers to fire them.

where β is the discount factor, and

$$\theta_I^j(s) = \frac{\beta F^j}{1 - \beta + \beta(F^j + H^j)} \text{ and } \theta_O^j(s) = \frac{1 - \beta + \beta F^j}{\beta F^j} \theta_I^j(s) \quad (3.3)$$

represent the (discounted) proportion of time that respectively a current insider and outsider type- j will spend unemployed during their lifetime; clearly, $\theta_O^j(s) > \theta_I^j(s)$. Notice that the expected utility of high-skill types, as well as θ_i^h , do not depend on EPL. It is useful at this juncture to define the degree of EPL which minimizes the (discounted) time spent unemployed by a low-skill insider and outsider respectively¹¹: $\tilde{s}_I = \arg \min \theta_I(s)$ and $\tilde{s}_O = \arg \min \theta_O(s)$. It is easy to see that $\tilde{s}_O < \hat{s}^l < \tilde{s}_I$ – where \hat{s}^l is the degree of EPL which minimizes the unemployment rate – since \tilde{s}_O and \tilde{s}_I take into account the current employment status of the agent. Figure 4 summarizes the behavior of $\theta_I^l(s)$, $\theta_O^l(s)$, and u^l with respect to s . Finally, notice that as β approaches 1, current employment conditions lose their relevance and the indirect utilities of low skill insiders or outsiders coincide: $\theta_I^j = \theta_O^j = u^j$.

4. The Political Environment

The degree of EPL and the level of UBs are determined in the political arena, where the individual preferences – described by the indirect utility functions at equations 3.2 and 3.3 – are aggregated into a policy outcome. We analyze two different political environments, in which the policy outcomes are decided once-and-for-all. First, we concentrate on a direct democracy, in which – at every election – agents vote over the income tax¹² which finances UBs, $\tau \in [0, \tau_{\max}]$ with $\tau_{\max} = \min\{\tau_A, \tau_B\}$, and the strictness of EPL, $s \in [0, 1]$. Due to the multidimensionality of the issue space, a Nash equilibrium typically fails to exist in this simple majority voting game. Hence, we follow Shepsle (1979) in analyzing voting equilibria induced by institutional restrictions, i.e.,

¹¹Notice that, as for the unemployment rate, $u^l(s)$, the assumptions on $F^l(s)$ and $H^l(s)$ stated in the text are sufficient for $\theta_I(s)$ and $\theta_O(s)$ to have a minimum, albeit not to be convex.

¹²The condition that $\tau \leq \min\{\tau_A, \tau_B\}$ guarantees a positive labor supply by the high skill insiders and satisfies the labor incentive constraint for the low skill insiders.

Structure-Induced Equilibria. Second, we consider a case of a representative democracy with electoral competition between two parties or coalitions that appeal to different constituencies of electors. Individual voters choose between the two parties according to their multidimensional policy platform, which is defined over the degree of EPL and the level of UBs. In this second environment, we use the concept of Party Unanimity Nash Equilibrium (PUNE), as introduced by Roemer (1999).

4.1. Direct Democracy and Issue-by-issue Voting

In a direct democracy with majority voting, individuals express their preferences directly over the policy issues. Since the issue space is bi-dimensional, (τ, s) , and thus a Nash equilibrium typically fails to arise, we impose on the voting game a set of institutional restrictions, which convert a multi-dimensional election into a simultaneous *issue-by-issue* voting game, in which a structure induced equilibrium exists (see Conde-Ruiz and Galasso, 2003 and 2005).

The concept of structure induced equilibrium – or issue-by-issue voting – applied to our political game can be summarized as follows. For every value of the degree of EPL, s , each voter determines her most preferred value of the level of UB, τ ; analogously, the most preferred level of s is chosen for every given τ . In other words, every agent votes two reaction functions: $\tau(s)$ and $s(\tau)$. A duple (τ^*, s^*) is an equilibrium of this voting game if τ^* represents the outcome of a majority voting over the jurisdiction τ – the level of unemployment benefit – when the other dimension is fixed at s^* , and likewise for s^* . In the following analysis, we will concentrate on the decision by the low skill insiders, who coincides with the median voter over every single issue¹³, provided that the low-skills unemployed are not a majority, $u^l < 1/2$.

The political decision over the EPL, $s(\tau)$, depends on the trade-off that EPL creates between the low skill insiders' inflow and outflow rates. An increase in the degree of

¹³A more detailed analysis of the political game is in the appendix.

EPL has two effects on their indirect utility (see eq. 3.2). First, it has an impact on the (discounted) proportion of time that current insiders spend unemployed during their lifetime, $\theta_I^l(s)$. Since the utility is larger when employed, this effect is positive for $s < \tilde{s}_I$ – where \tilde{s}_I represents the degree of EPL that minimizes $\theta_I(s)$ – and weakly negative thereafter, see Figure 4. Second, an increase in EPL modifies their future unemployment benefit (see eq. 3.1), through changes in the unemployment rate. This effect is positive for $s < \hat{s}^l$ – where \hat{s}^l represents the degree of EPL that minimizes the unemployment rate for the low skill types $u^l(s)$ – and weakly negative thereafter. Therefore, a low-skill insider chooses a degree of EPL between \hat{s}^l and \tilde{s}_I , as she trades off the current positive effect of a decrease in the unemployment inflow rate, with the future negative impact on the average unemployment rate, and thus on the level of UBs, see Figure 4.

How does this degree of EPL, $s(\tau)$, depend on the UB level? It is easy to see that for the relevant range of the tax rate, τ , there exists a negative relation between EPL and UB (see proposition A.1 in the Appendix), since a higher level of unemployment insurance for the low-skills reduces the cost, in terms of consumption, of being unemployed; thus leading a low-skill insider to require a lower degree of EPL. An example of the reaction function of s with respect to τ is at Figure 5.

In determining the tax rate that finances the UB, for any given level of EPL, $\tau(s)$, the low skill insiders trade off the cost represented by the current contribution and the expected future benefit from a UB system that redistributes in their favor. Their most preferred tax rate will thus be increasing in the progressiveness of the UB system and in the wage differential between high and low skill workers, but decreasing in the strictness of EPL (see proposition A.2 in the Appendix). The intuition is straightforward. More earning inequality or a more progressive UB system involve more cross-skill redistribution operated by the UB system, thereby making unemployment benefits more appealing to low skill types. More EPL – especially, for $s \in (\hat{s}^l, \tilde{s}_I)$, i.e., within the relevant range chosen by the low-skill insiders – reduces the low-skill insiders' probability

of being unemployed and hence to cash in the transfer. At the same time as large EPL increases unemployment, it also reduces the level of UBs via the budget constraint. The reaction function of τ with respect to s (see Figure 5) is thus negatively sloped.

To fully characterize the political equilibria of this issue-by-issue voting game over the strictness of EPL, s , and the UB level, τ , one needs to obtain the duple (s^*, τ^*) at the intersection of the two reaction functions of the low skill insider. This is described in the next proposition and characterized geometrically in Figure 5, where the reaction functions, $\tau_I^l(s)$ and $s_I^l(\tau)$, are portrayed.

Proposition 4.1. *If $\phi [w^l (1 + A) - \gamma] > \frac{w^l \bar{t} \rho^l}{\rho^h (1 - u^h)} \left(\frac{u^l(\bar{s}^l)}{\theta_I(\bar{s}^l)} - 1 \right)$, there exists a SIE of the voting game (s^*, τ^*) , such that $s^*(\tau^*) = s_I^l(\tau^*) \in (\hat{s}^l, \tilde{s}_I)$ and $\tau^*(s^*) = 1 - \sqrt{\frac{\gamma \rho^h}{\rho^h w^h - \frac{\rho^l w^l \bar{t}}{\phi(1 - u^h)} \left(\frac{u^l}{\theta_I} - 1 \right)}} > 0$.*

Labor market policies, composed of EPL and UB, are decided by the low skill insiders. The above Proposition suggests that, if the progressiveness of the UB system and the wage differential between high and low skill workers are sufficiently large, the UB system can successfully be used to redistribute towards the low skilled, and thus these pivotal players will thus endorse flexicurity configurations with a large redistributive UB scheme, but also with some labor market regulations – EPL – in order to reduce the risk of becoming unemployed.

Figure 5 displays this equilibrium outcome. For low earning inequality (small A) and in case of a less progressive UB system (small ϕ), instead, the low skill insiders will support configurations with a strict EPL.

4.2. Representative Democracy and Party Unanimity Nash Equilibrium (PUNE)

In this section, we consider a different political institution to aggregate individual preferences into a policy outcome. In a representative democracy, all voters – low and high skill, insiders and outsiders – choose between two parties or coalitions. Every individual

determines her electoral decision according to the policy platform presented by each party. The policy space is (τ, s) , and voters have an exogenous probability of turning out to elections: $0 < x_i^j < 1$ for $i = I, O$ and $j = l, h$.

We call the two parties: Right (R) and Left (L). Each party appeals to a constituency: the left party seeks the support of low skill insiders and outsiders, while the right party seeks the support of all high skill agents and of low skill insiders. Parties are assumed to be uncertain about the distribution of voter types, so that, if the Left and Right parties propose policies $y_L \in R^2$ and $y_R \in R^2$ respectively, the Left wins by majority vote¹⁴ with probability, $\pi(y_L, y_R)$. Under the pair of proposals, (y_L, y_R) , the expected utility of the Left constituency is

$$\begin{aligned} \Pi^L(y_L, y_R) = & \pi(y_L, y_R)[\rho^l(1 - u^l)V_I^l(y_L) + \rho^l u^l V_O^l(y_L)] + \\ & (1 - \pi(y_L, y_R))[\rho^l(1 - u^l)V_I^l(y_H) + \rho^l u^l V_O^l(y_H)] \end{aligned}$$

while the expected utility of the Right constituency is

$$\begin{aligned} \Pi^R(y_L, y_R) = & \pi(y_L, y_R)[\rho^l(1 - u^l)V_I^l(y_L) + \rho^h(1 - u^h)V_I^h(y_L) + \rho^h u^h V_O^h(y_L)] + \\ & (1 - \pi(y_L, y_R))[\rho^l(1 - u^l)V_I^l(y_H) + \rho^h(1 - u^h)V_I^h(y_H) + \rho^h u^h V_O^h(y_H)] \end{aligned}$$

Every party's partizan ideology corresponds to the bliss point of the party's militants, who are assumed to be low skill outsiders in the Left party and high skill insiders in the Right party. Each party is composed of three groups of actors: i) militants, who want the party to adhere as closely as possible to its principles, i.e., to its partizan ideology; ii) opportunists, who only care about winning the elections; and iii) reformists who wish to maximize the expected utility of the party's constituency. Given a proposal by the opposition, in every party the final decision about the policy requires inner-party unanimity, which coincides with unanimity between opportunists and militants, since

¹⁴Given a pair of policies (y_L, y_R) , if all voters are indifferent between the two parties, we assume that high skill types vote for party R , low skill outsiders vote for party L , and low skill insiders split their votes equally between the two parties.

the agreement of the reformists would automatically follow. More precisely, the Left party would deviate from y_L to y'_L only if

$$(\pi(y'_L, y_R), V_o^l(y'_L)) \geq (\pi(y_L, y_R), V_o^l(y_L)) \quad (4.1)$$

and similarly, the Right party would switch from y_R to y'_R only if

$$(1 - \pi(y_L, y'_R), V_I^h(y'_R)) \geq (1 - \pi(y_L, y_R), V_I^h(y_R)) \quad (4.2)$$

which allows us to define a party unanimity Nash equilibrium as follows.

Definition 4.2. A policy pair (y_L, y_R) is a party unanimity Nash equilibrium (PUNE) if and only if there is no y'_L at which condition 4.1 holds and there is no y'_R at which condition 4.2 holds.

We can now state the following proposition, according to which the policy outcome associated with the issue-by-issue voting game in the previous political environment is also a party unanimity Nash equilibrium of the game described in this section.

Proposition 4.3. $y_L = y_R = (s^*, \tau^*)$ is a PUNE equilibrium, where $s^* = s_I^l(\tau^*) \in (\hat{s}^l, \tilde{s}_I)$ and $\tau^* = 1 - \sqrt{\frac{\gamma \rho^h}{\rho^h w^h - \frac{\rho^l w^l \bar{l}}{\phi(1-u^h)} \left(\frac{u^l}{\theta_I} - 1\right)}}$.

A formal proof is in the appendix, but the intuition of this result is straightforward. The policy platform chosen by both parties targets the low skill insiders – which also in the previous political game coincided with the pivotal (median) voters (see section 4.1). A deviation in the policy platform by a party towards more extreme positions, such as its partizan ideology – given the other party’s platform – would be welcome by the militants, but be opposed by the opportunists, since it would reduce the party’s probability of winning the election.

4.3. The Trade-off

In both political environments, low-skill insiders represent the pivotal political players targeted by the policies. The incentives faced by these low-skills insiders – and thus the resulting labor market policies – may be affected by some crucial characteristics of the economy. More specifically, the next proposition analyzes how a change in the degree of progressiveness of the UB system, ϕ , and in the wage differential between high and low-skills workers, A , (recall that $w^h = (1 + A)w^l$) modifies the outcome of our politico-economic equilibrium in both political games.

Proposition 4.4. *An increase in the wage differential between high and low-skills workers, A , or an increase in the progressiveness of the UB system, ϕ , induce a change in an equilibrium outcome from (s^*, τ^*) to (s', τ') with $s' < s^*$ and $\tau' > \tau^*$.*

This proposition contains the crucial theoretical result of the paper and provides a political economic explanation for the observed trade-off between EPL and UB. In countries with large wage differentials and progressive UB systems, the low skill insiders, which typically constitute the pivotal political players, favor flexicurity configurations with large UB schemes, in order to appropriate more resources – when unemployed – from the high skill individuals, and low EPL. In the jargon of the issue-by-issue voting described in section 4.1, this involves an upward shift in the reaction function $\tau(s)$, as displayed in Figure 6. Because of the larger UB transfer, due to the wider wage differential or to a more progressive design, the difference in utility between the good state – employment – and the bad state – unemployment – shrinks, and hence low skill insiders vote for less EPL. The reaction function $s(\tau)$ shifts downwards, and a new equilibrium¹⁵ with more UB and less EPL is reached, as displayed at point B in Figure 6.

¹⁵Notice that also an increase in the discount factor tilts the equilibrium towards more UB and less EPL, since it reduces the relevance to the insiders of their current employment status, thereby inducing them to accept less EPL in exchange for more UB (for a formal treatment of this aspect, see the companion paper, Boeri, Conde-Ruiz and Galasso, 2003).

5. Empirical Relevance

Our model implies i) a negative cross-sectional correlation between the progressiveness of UBs and the strictness of EPL, and ii) a positive cross-sectional correlation between generosity of UBs and wage dispersion¹⁶.

Figure 7 plots the OECD index of strictness of EPL for regular workers and the measure of the progressiveness of UB systems discussed in section 2. We combine time-series and cross-sectional variation for the ECHP countries to maximize observations (104). The correlation coefficient is -.78 and the t-statistics is 12.6, which is significant at 99 per cent. Consistently with the predictions of our model, EPL for regular workers is lower in countries where UB systems are more progressive.

Another key implication of our model is that countries with less compressed wage structures should exhibit institutional configurations with more UB and less EPL (flexibility). Clearly, wage dispersion may be affected by UBs as well as by other institutions (such as minimum wages) providing floors to wage setting. In order to control for these effects, we measure wage dispersion as the Gini coefficient over the distribution of *predicted* wages out of a standard Mincer-type earning equation corrected for self-selection. In particular, we predict wages based on the following equation:

$$\log(w_i) = \alpha + \beta EDU_i + \gamma_1 TEN_i + \gamma_2 TEN_i^2 + \lambda_i + \varepsilon_i$$

where EDU represents years of education and TEN denotes tenure in the current job, while λ is a Heckman correction term. As can be seen from Figure 8, countries with more UB and less EPL (the ratio between the two measures is displayed in the vertical axis) exhibit more dispersed earning structures over observables (and controlling for self-selection). In this case, the correlation coefficient is .34 and the t-statistics is 3.6.

¹⁶A correlation between wage compression and EPL, yet not UB generosity, was also in Bertola and Rogerson (1997), who viewed them as complementary policies.

5.1. Lessons from the Reformers

The above pairwise correlations are not informative as to the order of causality of the correlation between countries' locations along the UB/EPL tradeoff and earning dispersion. Better insights in this respect may come by contrasting the experience of the few countries that reduced EPL for regular workers in the period covered by data with that of countries with similar initial institutional configurations that did not reform their labor market. As recalled in section 2, the only major reformers were Korea, Finland, Spain and Greece. The radical reforms of EPL that occurred in Finland and Spain were split into a number of milder liberalization measures. In particular, in Finland, there were three waves of reforms: in 1991, 1996 and 2001, while in Spain reductions of EPL were enacted in 1994 and 1997. In Korea, reforms were carried out in 1998. In Greece, EPL was modified in the late 1980s (a period not covered by ECHP data) and the reform was much milder than in Finland and Spain. Hence, we concentrate on Finland, Spain and Korea.

Table 3 compares the experience of Spain with that of Greece, the experience of Finland with that of Denmark, and the experience of Korea with that of Japan. These "matches" are chosen by drawing on a taxonomy of labour market and social policy institutions in the EU (Bertola and Boeri, 2002), pulling together, on the one hand, Nordic and, on the other hand, Southern European countries, and taking Japan as the closest match to Korea in the 1990s. Importantly, the changes to the dispersion of earnings before the reforms are likely to be associated to exogenous factors, such as a spread of ICT technologies (e.g., the percentage of households using personal computers users increased by 34 base points in Spain compared with only 15 per cent in Greece) or women participation in the labour market (the employment rate of women increased by 2.7 base points in Finland compared with only 0.8 for Denmark).

As shown in Table 3, Spain reduced EPL after having experienced an increase in the dispersion of its earning distribution (the Gini coefficient over earnings had increased

by 6 base points). The reduction in EPL was also associated with an increase in the generosity and progressiveness of UBs, while the opposite happened in Greece. Moving to another match, Finland reduced EPL for regular workers without having experienced an increase in earning dispersion, but – unlike Denmark – it adjusted the design of its UB system by making it more progressive. Turning to the last match, table 3 shows that also in Korea EPL reduction was associated with an increase in earning dispersion, unlike developments in Japan. UB adjustments were also made in Korea in line with the predictions of our model.

Overall, there is some indication that countries reducing EPL for regular workers experienced an increase in earning inequality or in the progressiveness of UBs compared with countries with institutional configurations, which did not reform EPL for regular workers.

5.2. Conclusions

OECD countries provide different types of insurance to workers against labor market risks, by combining different degrees of employment protection and unemployment insurance. A heated debate has taken place over the need to reform some of the existing labor market institutions, and some form of consensus has emerged even among academics and international organizations that countries should adopt more “mobility-friendly” institutional configurations assigning a greater weight to UB and less importance to EPL in protecting workers against labor market risk. However, reforming institutions along these lines has proved difficult and politically costly.

Unlike previous literature, this paper characterizes EPL and UBs as schemes redistributing not only between insiders and outsiders, but also across skill groups. Our theoretical model suggests that “flexicurity” configurations, characterized by less EPL and more UB, should emerge in countries with less compressed wage structures. Empirical findings are in line with this theoretical implication. Moreover, we document

that the few countries reforming EPL for regular contracts also featured increasing progressiveness of UBs and/or widening earning differentials.

Our analysis may inspire a political feasibility theorem: reforms of employment protection need to trade labor market flexibility with state-provided unemployment insurance which redistributes in favor of the low-skill segments of the workforce. The trade-off is likely to become steeper when there is a lower degree of redistribution across skill groups embedded in the design of UBs. This implication of our model differs from the prescriptions in Blanchard and Tirole (2003) that configurations with more UB and less EPL could be obtained by introducing experience-rating in the UBs, that is, internalizing the costs of dismissals to the employers “responsible” for the redundancies. This paper implies that political flexibility of reforms does not require that UBs mimic EPL. UBs can still pool risk across employers, but either wage differentials grow larger or UBs should become more progressive in order to win consensus to reforms.

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A. Appendix

Proposition A.1. For $u^l < 1/2$, the degree of EPL chosen by the median voter, $s^m(\tau)$, displays the following features: i) $s^m(\tau) = s_I^l(\tau) \in (\hat{s}^l, \tilde{s}_I)$; ii) $s^m(\tau)$ is convex in τ and decreasing for $\tau < \tau_C$, where τ_C s.t $\partial\Delta^l/\partial\tau = 0$; and iii) $s^m(\tau)$ is decreasing in A and in ϕ .

Proof of Proposition A.1: For $u^l < 1/2$, the median voter over s is a low ability insider, since high skill agents are unaffected by s and thus may be assumed to abstain from voting on this issue. Hence, for given τ , the most preferred level of EPL, $s_I^l(\tau)$, is obtained by maximizing eq. 3.2 with respect to s . Denote $F_s^l = \partial F^l/\partial s$ and $H_s^l = \partial H^l/\partial s$.

i) To see that $s_I^l(\tau) \in (\hat{s}^l, \tilde{s}_I)$, we equate to zero the first order condition resulting from this maximization problem:

$$\underbrace{\frac{\beta^2(F^l H_s^l - F_s^l H^l)\Delta^l}{(1 - \beta + \beta(F^l + H^l))^2}}_I - \underbrace{\frac{\beta(1 - \beta)F_s^l\Delta^l}{(1 - \beta + \beta(F^l + H^l))^2}}_{II} + \underbrace{\theta_I^l \frac{\partial b^l}{\partial s}}_{III} \quad (\text{A.1})$$

where

$$\frac{\partial b^l}{\partial s} = -\frac{F_s^l H^l - F^l H_s^l}{(F^l + H^l)^2} \left(\frac{b^l}{u^l} + \frac{\tau w^l \bar{l}}{u^l} \right)$$

If we evaluate this FOC in \hat{s}^l , the first and the third terms, i.e., I and III , are equal to zero, while the second term, and thus the entire FOC, is positive, since $F_s^l < 0$. Therefore, $s_I^l(\tau) > \hat{s}^l$. On the other hand, if we evaluate this FOC in \tilde{s}_I , the first two terms, i.e., I and II , are equal to zero, since $\beta(F^l H_s^l - F_s^l H^l) - (1 - \beta)F_s^l = 0$ for $s = \tilde{s}_I$; while the third term, and thus the entire FOC, is negative, since $\partial b^l/\partial s < 0$ for $s = \tilde{s}_I$. Finally, simple algebra shows that the second order condition of this maximization problem evaluated at $s_I^l(\tau)$ is negative, so that $s_I^l(\tau) \in (\hat{s}^l, \tilde{s}_I)$ is a maximum.

ii) To prove that $s_I^l(\tau)$ is convex in τ and decreasing for $\tau < \tau_C$, where τ_C s.t $\partial\Delta^l/\partial\tau = 0$, we apply the implicit function theorem to the FOC at eq.A.1. Since

$SOC(s_I^l) < 0$, we have that the sign of $ds_I^l(\tau)/d\tau$ is equal to the sign of $dFOC(s_I^l(\tau))/d\tau$.

Notice that the FOC at eq.A.1 can be written as

$$-\Delta^l \frac{\partial \theta_I^l(s)}{\partial s} + \theta_I^l(s) \frac{\partial b^l}{\partial s} = 0 \quad (\text{A.2})$$

and its derivative as

$$\frac{\partial FOC(s_I^l(\tau))}{\partial \tau} = -\frac{\partial \theta_I^l(s)}{\partial s} \frac{\partial \Delta^l}{\partial \tau} + \theta_I^l(s) \frac{\partial^2 b^l}{\partial s \partial \tau} = \frac{\partial \Delta^l}{\partial \tau} \left(\frac{\theta_I^l(s)}{u^l} \frac{\partial u^l}{\partial s} - \frac{\partial \theta_I^l(s)}{\partial s} \right)$$

since $\frac{\partial^2 b^l}{\partial s \partial \tau} = \frac{\partial \Delta^l}{\partial \tau} \frac{1}{u^l} \frac{\partial u^l}{\partial s}$. Recall that $\partial \theta_I^l(s)/\partial s \leq 0$ and $\partial u^l/\partial s \geq 0$ for $\hat{s}^l \leq s_I^l \leq \tilde{s}_I$, so that the sign of $ds_I^l(\tau)/d\tau$ is equal to the sign of $\partial \Delta^l/\partial \tau$.

Since

$$\frac{\partial \Delta^l}{\partial \tau} = -\left(w^l \bar{l} + \frac{\partial b^l}{\partial \tau} \right) = -\frac{1}{\rho^l u^l} \left\{ \rho^l w^l \bar{l} + \rho^h \phi(1-u^h) \left(w^h - \frac{\gamma}{(1-\tau)^2} \right) \right\}$$

and $\frac{\partial \Delta^l}{\partial \tau} = \frac{\rho^h \phi(1-u^h)}{\rho^l u^l} \frac{2\gamma}{(w^h)^2 (1-\tau)^3} > 0$, $s_I^l(\tau)$ is decreasing for $\tau < \tau_C$, where τ_C s.t. $\partial \Delta^l/\partial \tau = 0$, and is convex.

iii) To prove that $s_I^l(\tau)$ is decreasing in A and in ϕ , we apply again the implicit function theorem to the FOC at eq.A.1. Since $SOC(s_I^l) < 0$, we have that the sign of $ds_I^l(\tau)/dA$ is equal to the sign of $dFOC(s_I^l(\tau))/dA$, and the sign of $ds_I^l(\tau)/d\phi$ is equal to the sign of $dFOC(s_I^l(\tau))/d\phi$, where

$$\frac{\partial FOC(s_I^l(\tau))}{\partial A} = -\frac{\partial \theta_I^l(s)}{\partial s} \frac{\partial \Delta^l}{\partial A} \leq 0 \text{ and } \frac{\partial FOC(s_I^l(\tau))}{\partial \phi} = -\frac{\partial \theta_I^l(s)}{\partial s} \frac{\partial \Delta^l}{\partial \phi} \leq 0$$

since

$$\frac{\partial \Delta^l}{\partial A} = -\frac{\tau(1-u^h)\phi w^l \rho^h}{u^l \rho^l} < 0, \quad \frac{\partial \Delta^l}{\partial \phi} = -\frac{\tau(1-u^h)l^h w^h \rho^h}{u^l \rho^l} < 0 \quad (\text{A.3})$$

$$\text{and } \frac{\partial \theta_I^l(s)}{\partial s} \leq 0 \text{ for } \hat{s}^l \leq s_I^l \leq \tilde{s}_I. \quad (\text{A.4})$$

q.e.d.

Proposition A.2. For $u^l < 1/2$, the UB level chosen by the median voter, $\tau^m(s)$, displays the following features: i) $\tau^m(s) = 1 - \left(\frac{w^h}{\gamma} - \frac{\rho^l w^l \bar{l}}{\gamma \rho^h \phi (1 - u^h)} \left(\frac{u^l}{\theta_I} - 1 \right) \right)^{-1/2}$, (ii) $\tau^m(s)$ is decreasing in s and (iii) $\tau^m(s)$ is increasing in A and in ϕ .

Proof of Proposition A.2: Consider the decision of type- j agent (insider or outsider) over for τ a given s . For $j = l, h$ and $i = I, O$, the maximization of eq. 3.2 with respect to τ , yields the following first order condition, where the first term represents the marginal utility cost from paying higher taxes, while the second term denotes the marginal utility benefit from the higher UB, weighted by the discounted probability of being employed or unemployed:

$$- (1 - \theta_i^j) w^j l^j + \theta_i^j \frac{\partial b^j}{\partial \tau} = 0 \quad (\text{A.5})$$

with

$$\frac{\partial b^l}{\partial \tau} = \frac{1}{u^l} \left(w^l \bar{l} (1 - u^l) + \frac{\rho^h w^h \phi (1 - u^h)}{\rho^l} - \frac{\gamma \rho^h \phi (1 - u^h)}{\rho^l (1 - \tau)^2} \right)$$

and

$$\frac{\partial b^h}{\partial \tau} = \frac{(1 - \phi) (1 - u^h)}{u^h} \left(w^h - \frac{\gamma}{(1 - \tau)^2} \right).$$

Clearly, current outsiders will choose a higher tax rate than current insiders, $\tau_I^j \leq \tau_O^j$ for $j = l, h$, since $\theta_I^j < \theta_O^j$. Moreover, it is easy to see that high ability insiders will prefer a zero tax rate. In fact, eq. A.5 can be written as

$$-\frac{1 - \theta_I^h}{1 - u^h} \left(w^h - \frac{\gamma}{1 - \tau} \right) + \frac{\theta_I^h}{u^h} \left(w^h - \frac{\gamma}{(1 - \tau)^2} \right) < 0$$

since $\theta_I^h < u^h$. Finally, simple algebra shows that the most preferred tax rate by a low ability insider is

$$\tau_I^l(s) = 1 - \left(\frac{w^h}{\gamma} - \frac{\rho^l w^l \bar{l}}{\gamma \rho^h \phi (1 - u^h)} \left(\frac{u^l}{\theta_I} - 1 \right) \right)^{-1/2} \quad (\text{A.6})$$

which yields $\tau_I^l(s) > 0$ for $w^h \rho^h > \gamma \rho^h + \frac{\rho^l w^l \bar{l}}{\gamma \rho^h \phi(1-u^h)} \left(\frac{u^l(s)}{\theta_I(s)} - 1 \right)$.

For $u^l < 1/2$, the previous results ($\tau_I^j \leq \tau_O^j \forall j$ and $\tau_I^l(s) \geq \tau_I^h(s) = 0$) imply that the median voter will belong to the low skill insider for any possible ranking: (1) $\tau_O^l \geq \tau_I^l \geq \tau_0^h \geq \tau_I^h$; (2) $\tau_O^l \geq \tau_O^h \geq \tau_I^l \geq \tau_I^h$; and (3) $\tau_O^h \geq \tau_O^l \geq \tau_I^l \geq \tau_I^h$, which proves (i) above since $\tau^m(s) = \tau_I^l(s)$.

Finally, using eq. A.6, simple algebra proves (ii) and (iii) above. **q.e.d.**

Proof of Proposition 4.1: We need to show that the reaction functions $\tau_I^l(s)$ and $s_I^l(\tau)$ cross – at least – once. Recall that, by Proposition A.2, $\tau_I^l(s)$ is decreasing in s and by Proposition A.1, $s_I^l(\tau) \in (\hat{s}^l, \tilde{s}_I)$ is decreasing in τ . Moreover, recall that $\partial \Delta^l / \partial \tau < 0$ for $\tau < \tau_C$ (see the prof of proposition A.1) and $\tau < \min\{\tau_A, \tau_B\}$. We thus need to consider three cases: (i) $\tau_B < \tau_A$ and $\tau_B < \tau_C$; (ii) $\tau_A \leq \tau_B$ and $\tau_A < \tau_C$; and (iii) $\tau_C < \tau_A$ and $\tau_C < \tau_B$.

Case (i): τ_B is the upper bound on the tax rate for any $s \in (\hat{s}^l, \tilde{s}_I)$. By inspecting eq. A.1, it is easy to see that the reaction function $s_I^l(\tau)$ ranges between $s_I^l(0) = \tilde{s}_I$ for $\tau = 0$ (and hence $b^l = 0$) and $s_I^l(\tau_B) = \hat{s}^l$ for $\tau = \tau_B$ (and hence $\Delta^l = 0$). Consider the reaction function $\tau_I^l(s)$. Clearly, we have that, for $s = \hat{s}^l$, $\tau_I^l(\hat{s}^l) \leq \tau_B$. To show that the two reaction functions cross, we thus need to establish that for s close to \tilde{s}_I the reaction function $\tau_I^l(s)$ is above $s_I^l(\tau)$. Since $s_I^l(0) = \tilde{s}_I$, for $\tau = 0$, we need to show that $\tau_I^l(\tilde{s}_I) > 0$. From the expression of $\tau_I^l(s)$ at Proposition A.2, it is easy to see that $\tau_I^l(\tilde{s}_I) > 0$ if and only if $\phi \left[w^l (1 + A) - \gamma \right] > \frac{w^l \bar{l} \rho^l}{\rho^h (1-u^h)} \left(\frac{u^l(\tilde{s}^l)}{\theta_I(\tilde{s}^l)} - 1 \right)$.

Case (ii): τ_A is the upper bound on the tax rate for any $s \in (\hat{s}^l, \tilde{s}_I)$. In this case, the reaction function $s_I^l(\tau)$ ranges between $s_I^l(0) = \tilde{s}_I$ for $\tau = b^l = 0$ and $s_I^l(\tau_A) < \hat{s}^l$ for $\tau = \tau_A$, since $\Delta^l(\tau_A) > 0$. Consider the reaction function $\tau_I^l(s)$. Clearly, we have that, for $s = \hat{s}^l$, $\tau_I^l(\hat{s}^l) \leq \tau_A$. The remaining of the prof follows from case (i).

Case (iii): τ_C is lower than the upper bound on the tax rate (either τ_A or τ_B). In this case, the reaction function $s_I^l(\tau)$ has a minimum at τ_C and increases for τ between τ_C and τ_A or τ_B . As in cases (i) and (ii), to show that the reaction functions cross, we

need to show that $\tau_I^l(\hat{s}_I^l) \leq \tau_C$. Recall that τ_C is such that $\frac{\partial \Delta^l}{\partial \tau} = -\left(w^l \bar{l} + \frac{\partial b^l}{\partial \tau}\right) = 0$; whereas $\tau_I^l(s)$ is such that $-(1 - \theta_I^l)w^l \bar{l} + \theta_I^l \frac{\partial b^l}{\partial \tau} = 0$. It is easy to see that the last equation (the first order condition of the low skill insiders) evaluated at $\tau = \tau_C$ is negative, which shows that $\tau_I^l(\hat{s}_I^l) \leq \tau_C$. The remaining of the proof follows case (i) above. **q.e.d.**

Proof of Proposition 4.3: A) First, we have to proof that if $y_R = (s_I^l, \tau_I^l)$ then $y_L = y_R$ is a best response over the space of inner-party unanimity proposal set, that is:

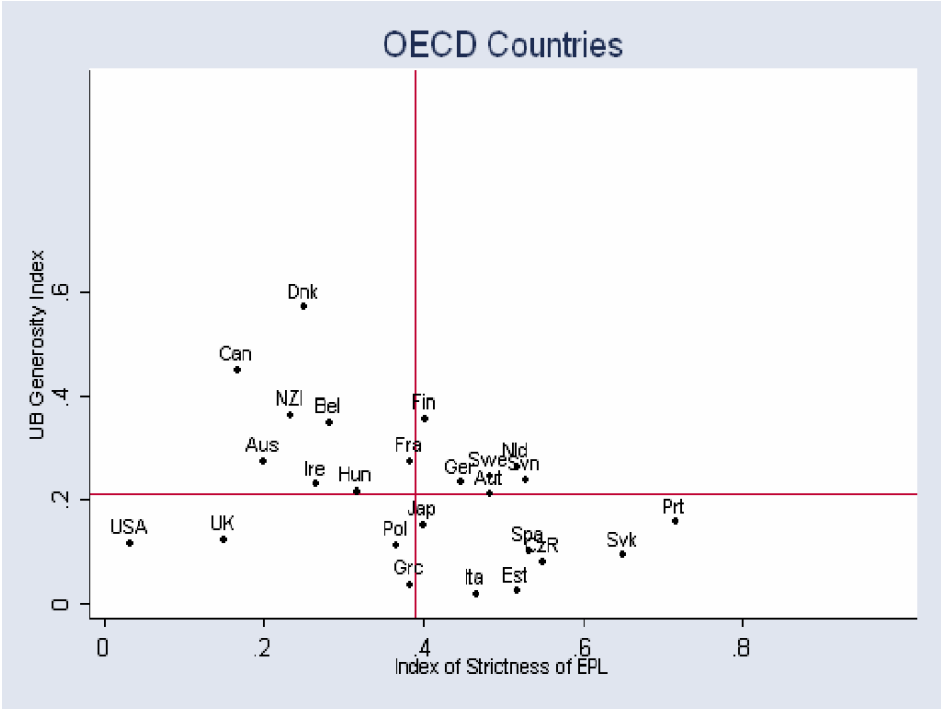
- (i) $\pi(y_L = y_R, y_R) > \pi(y'_L, y_R) \forall y'_L$ and
- (ii) $V_o^l(y_L = y_R) > V_o^l(y'_L) \forall y'_L$

Condition (i) is clearly satisfied. In fact, if party L deviates from y_R , it would lose half of the votes by the low ability insiders, but gain none, since it always has all the votes of the other group in its constituency (the low ability outsiders). Thus, $y_L = y_R$ will maximize the number of votes for party L , and is a best response in the *PUNE* sense. (Notice that by choosing a proposal $y'_L \neq y_R$ the utility of L party militants (the low ability outsiders) may indeed increase; but this proposal would be blocked by the opportunists in the party.

B) The same reasoning can be used to show that, if $y_L = (s_I^l, \tau_I^l)$, then $y_R = y_L$ is a best response.

Therefore, $y^R = y^L = y$ is a *PUNE*. **q.e.d.**

Proof of Proposition 4.4. To prove this proposition, we show that an increase in A or ϕ moves the reaction functions $s_I^l(\tau)$ and $\tau_I^l(s)$ as displayed in Figure 6. (i) An increase of A or ϕ moves the reaction function $s(\tau)$ to the left, since $ds_I^l(\tau)/dA < 0$ and $ds_I^l(\tau)/d\phi < 0$, as shown in the proof of proposition A.1. (ii) It is straightforward to see that an increase of A or ϕ moves the reaction function $\tau^m(s)$ upward, by just deriving $\tau^*(s^*)$ at Proposition 4.1 w.r.t. A or ϕ . **q.e.d.**



The UB/EPL Tradeoff

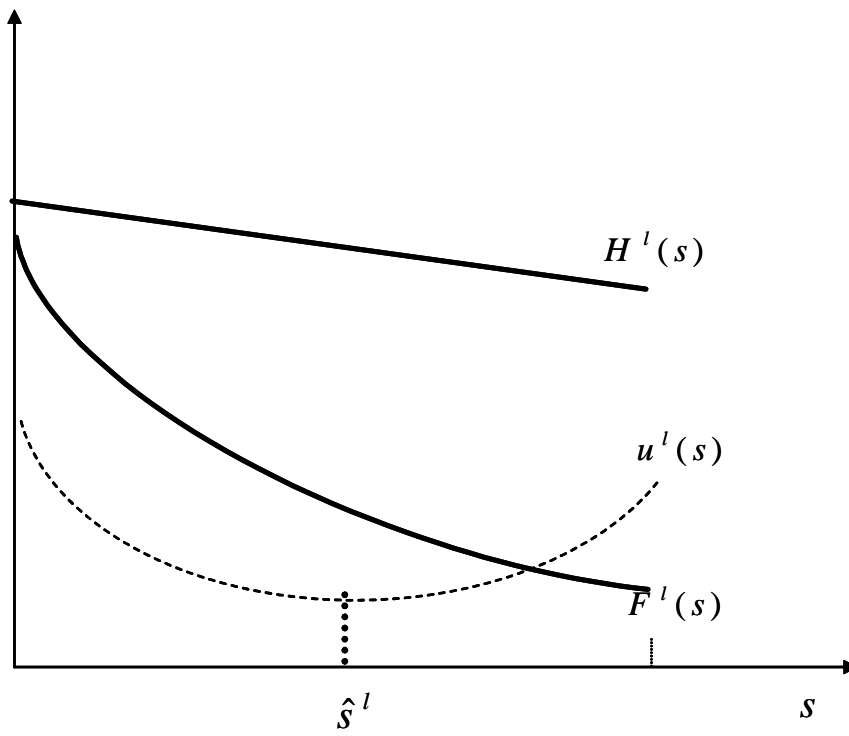


Figure 1: EPL and Low-skill Types

Source: ECHP.

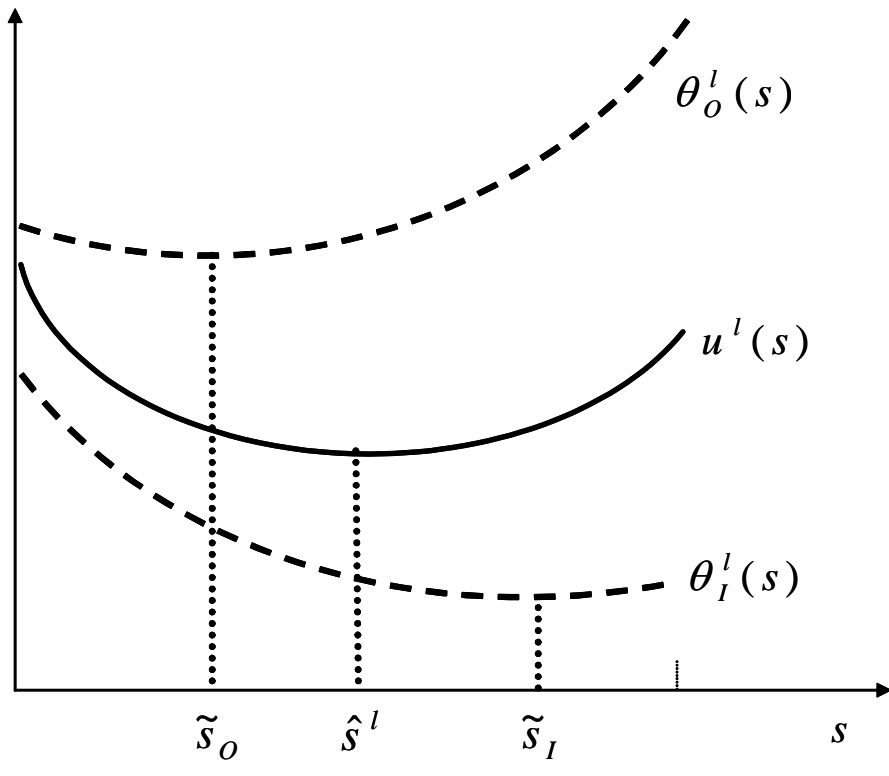


Figure 2: EPL: Low-skill Insiders and Outsiders

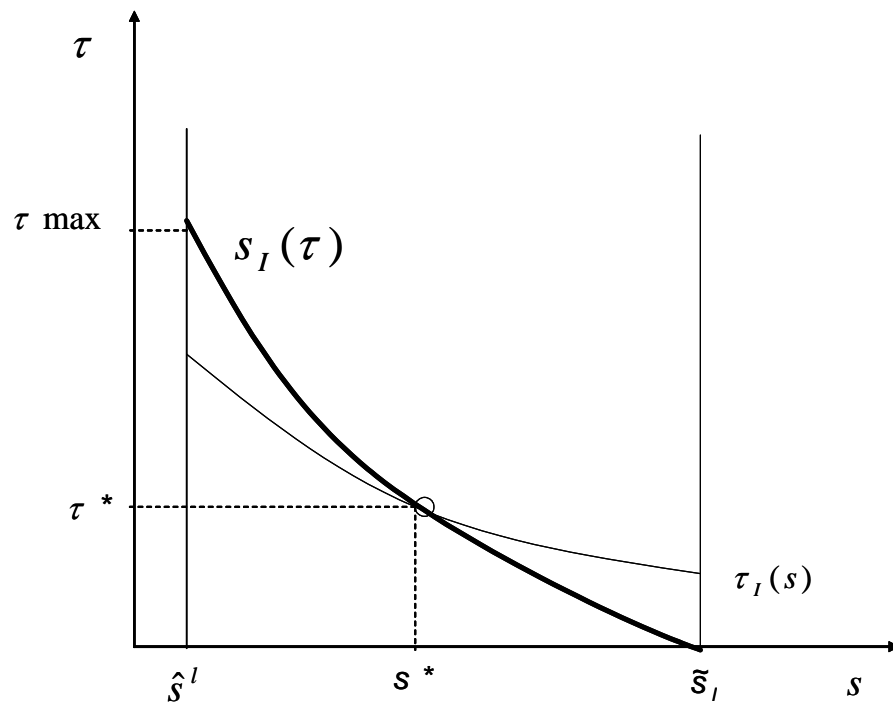


Figure 3: The UB-EPL Political Equilibrium

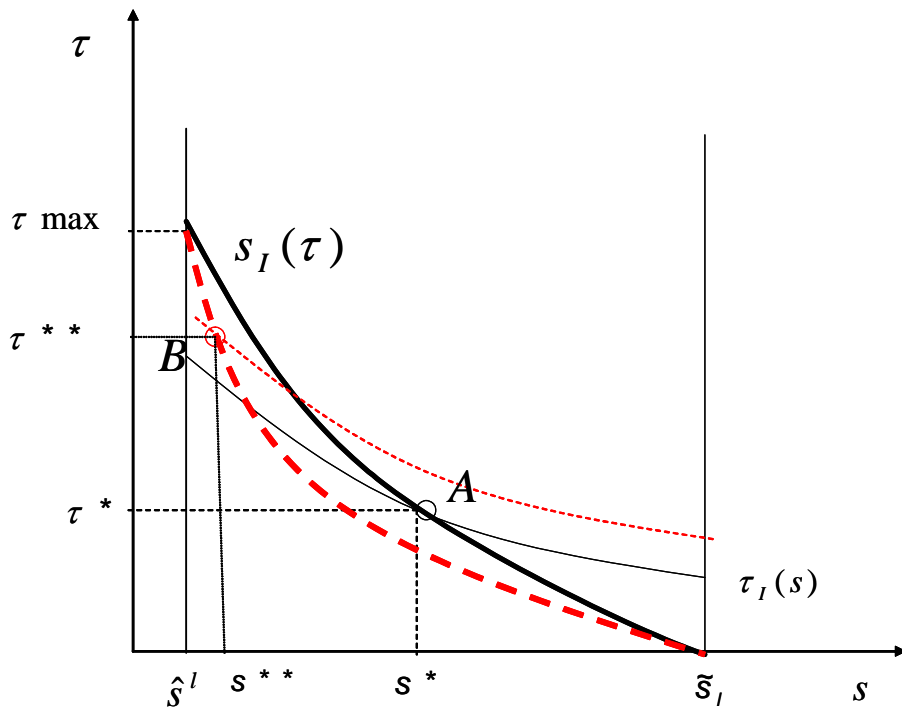


Figure 4: Wage Differential and the EPL-UB Trade-Off

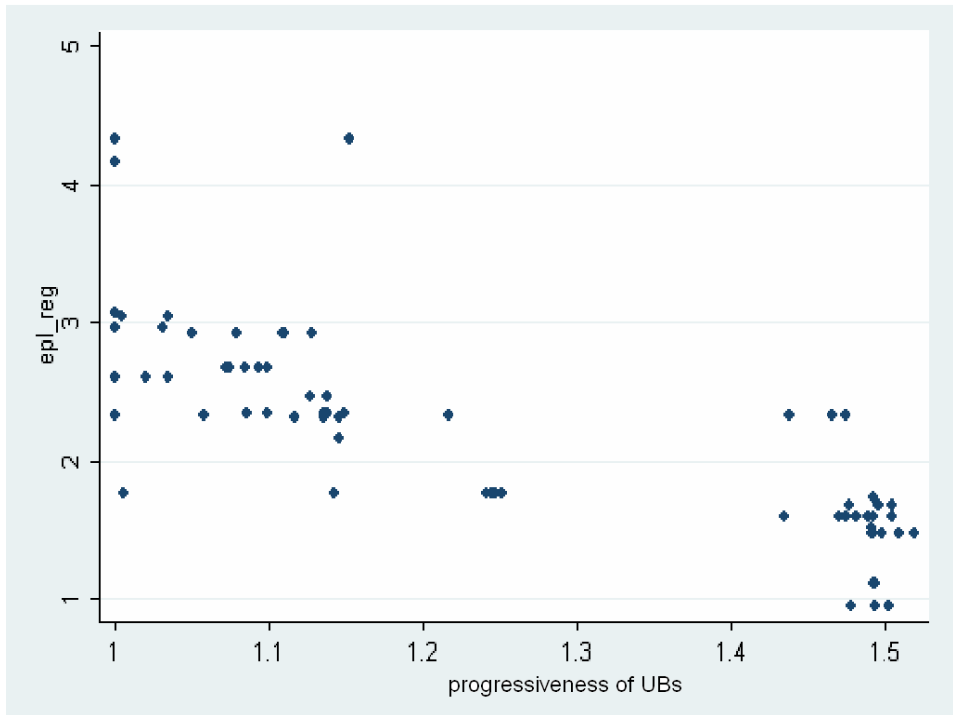


Figure 5: Progressiveness of UB systems and EPL for regular workers

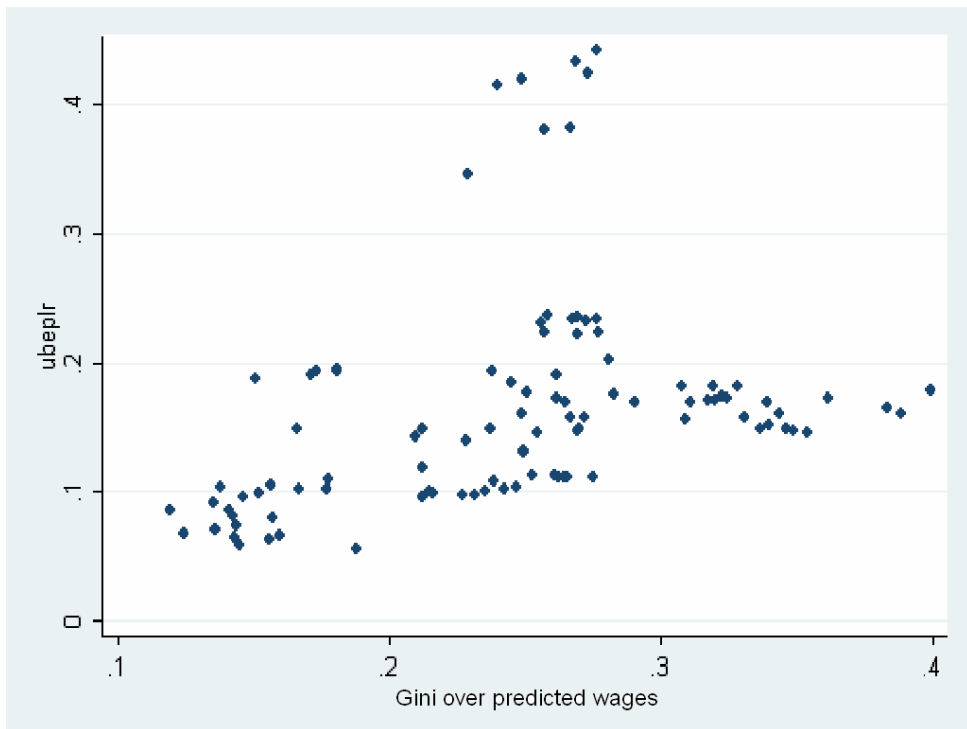


Figure 6: The tradeoff and earning dispersion

Table 1: Alternative measures of the trade-off (late 1990s)

<i>EPL correlated with</i>	<i>Working-age population</i>	<i>Male prime-age (25 to 45)</i>
<i>a. UB coverage</i>	-.63**	-.71**
<i>b. UB net replacement rate</i>	-.34*	—
<i>a * b</i>	-.55**	-.66**
** significant at 99	* significant at 95	nr of observations =14

Source: European Community Household Panel (ECHP)

Table 2: Progressiveness in the Design of Unemployment Benefit System

Country	67/100	67/150
Australia	1.45	1.96
Austria	1.00	1.00
Belgium	1.32	1.80
Canada	1.05	1.51
Czech Republic	1.00	1.00
Denmark	1.38	1.79
Finland	1.22	1.52
France	1.05	1.15
Germany	1.02	1.00
Greece	1.48	2.09
Hungary	1.35	1.71
Iceland	1.35	1.86
Ireland	1.40	1.83
Italy	0.93	1.09
Japan	1.17	1.40
Korea	1.06	1.50
Luxembourg	0.99	0.97
Netherlands	1.14	1.37
New Zealand	1.43	2.04
Norway	0.98	1.23
Poland	1.44	2.14
Portugal	1.04	0.96
Slovak Republic	0.95	1.24
Spain	1.10	1.58
Sweden	1.06	1.49
Switzerland	1.14	1.13
UK	1.40	2.03
USA	1.00	1.18

Note: The replacement rates are estimated after one year of unemployment and are referred to an average production worker single and aged 40.

Table 3

	$\Delta\text{EPL}_{\text{reg}}$	$\Delta\text{Gini earnings}$	$\Delta\text{UB}_{\text{gen}}$	$\Delta\text{UB}_{\text{prog}}$
Spain	-0.36	0.06	0.01	0.03
Greece	0.00	-0.02	-0.01	-0.03
Finland	-0.14	0.00	0.00	0.03
Denmark	0.00	-0.04	-0.13	-0.02
Korea	-0.85	0.25	0.00	n.a.
Japan	0.00	-0.05	-0.02	n.a.

Note: ΔEPL : change in the value of the OECD EPL index for regular workers, over reform period (1994-2001 for Spain and Greece; 1996-2001 for Finland and Denmark; 1994-2001 Korea and Japan).

$\Delta\text{Gini earnings}$: change in the Gini coefficient before the reform (period 1994-1997 for Spain; 1996-2001 for Finland; 1998-1994 for Korea).

$\Delta\text{UB Generosity}$: change in the generosity of UBs, that is, the coverage of UBs (the fraction of unemployed receiving UBs) multiplied by the average gross replacement rate in the first-year of receipt of benefits.

$\Delta\text{UB Progressiveness}$: change in the ratio of the replacement rates at two earning levels (100 per cent or 2/3 of the wage of the average production worker).