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Unemployment at Risk: The Policy Determinants of Labour Market Exposure to Economic Shocks

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Unemployment at Risk: The Policy Determinants of Labour Market Exposure to Economic Shocks

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Abstract

This paper examines the vulnerability of labour markets to adverse economic shocks. We define labour market exposure as the cumulated amount of excess unemployment generated by a shock before unemployment returns to steady-state. We use a panel of 19 countries covering the period 1985-2010 to assess the influence of labour market policies on labour market exposure, which is also calculated country by country. We find that less generous unemployment insurance, more active labour market policies or a lower minimum wage imply a trade-off between average unemployment and labour market exposure, as they help low-skill workers to get out of unemployment at the cost of increased vulnerability to adverse shocks. On the other hand, reducing the tax wedge is conducive to both lower steady-state unemployment and labour market exposure.

1. INTRODUCTION

Even four years after the trough from the Great Recession, the absence of a vigourous and sustained recovery has pushed a rising share of workers to the margin of the labour market in many OECD countries. There is still a genuine risk of seeing a sizeable share of them – in particular youth and low-skilled workers – losing attachment to the labour market, with potentially adverse consequences on the career prospects of these workers as well as more broadly for future potential growth. In this context, it is legitimate to ask whether some labour market policies and institutions that may be more conducive to low unemployment during "normal times" may leave labour markets less well-equipped to cope with severe economic recessions, and therefore more prone to entail large swings in employment along the business cycle. Put differently, is there some evidence that policy settings that contribute to lower steady-state unemployment could lead to more persistent deviations from steady-state following shocks?

Insofar as the short- and medium-term vulnerability of labour markets cannot be neglected from a political point of view, this is a major source of concern for policy-makers. In particular, they may be more reluctant to undertake pro-employment labour market reforms if these come at the price of higher short-term unemployment persistence and pro-cyclicality. Where trade-offs are identified, the ancillary question is the extent to which these trade-offs could be eased through temporary changes in features or parameters of specific policies that would strenghten their stabilising properties (or weaken the de-stabilising ones), while still minimising the potential adverse effects on steady-state unemployment. Even though this would in principle lead to more optimal outcomes, such structural policy fine-tuning may in practice be difficult to implement effectively.

In order to address these questions, it is first necessary to identify which type of labour market policy (henceforth LMP) settings appear more likely to favour lower trend unemployment but at the cost of stronger pro-cyclicality and persistence (a policy trade-off), and which ones seem to improve outcomes on both counts (a policy win-win). To that aim, we assess the relationship between labour market policies and unemployment inflow and outflow rates (i.e. the turnover rates). As there is a strong empirical link between the observed unemployment rate and the (steady-state) unemployment rate predicted by turnover rates, the empirical relationships between policies and turnover rates depict fairly well unemployment dynamics. Decomposing the unemployment rate into its turnover components allows us to unveil the flow channels through which labour market policies can affect short-term and long-term unemployment dynamics. Moreover, we also examine how policies affect turnover dynamics, as we allow for an effect of policies not only on the average level of turnover rates, but also on their degree of time persistence and on their sensitivity to economic shocks.

In a second step, we define and calculate labour market exposure as the cumulated excess unemployment that follows an adverse economic shock, before unemployment returns to initial level. Interestingly, labour market exposure is found to differ quite substantially across various labour market policy settings. Indeed, we find that less generous unemployment insurance, more active labour market policies and a lower minimum wage imply larger labour market exposure. The explanation ultimately relies on a selection effect: the latter policies are associated with lower average unemployment hence a relatively tighter attachement of low-skill workers to the labour market. As job positions occupied by low-skill workers are intrinsically more fragile, the unemployment rate is subject to potentially large variations in a downturn. Hence, this supply-side selection effect implies a trade-off between between average unemployment and labour market exposure.

No such trade-off is uncovered with other policies whose influence operates primnarily through labour demand. We find that stricter employment protection, which is commonly associated with downward wage rigidities, as well as a higher tax, wedge increase turnover and unemployment persistence. We interpret this finding as the sign that larger labour costs are highly detrimental to labour market resilience. As a consequence, stricter employment protection and a larger tax wedge raise both labour market exposure and, to a lesser extent, steady-state unemployment. Reducing the tax wedge, and to a lesser extent relaxing employment legislation,constitute therefore a "win-win" strategy.

This paper relates to past studies focusing on unemployment dynamics (see Blanchard, 2006, for a comprehensive survey). Starting from the classical wage and price-setting model that highlights real and nominal wage rigidities (Layard *et al.*, 1991, Bruno and Sachs, 1985), a large empirical literature has assessed the unemployment effects of unemployment insurance and employment protection systems (Nickell, 1990, 1998; Machin and Manning, 1999; OECD, 1994, 2006; Boeri and Garibaldi, 2007; Bentolila *et al.*, 2010), fiscal policy (Elmeskov *et al.*, 1998, Daveri and Tabellini, 2000), wage bargaining institutions (Calmfors and Driffill, 1988), product market regulation (Blanchard and Giavazzi, 2003; Nicoletti and Scarpetta, 2005; Fiori *et al*., 2007; Griffith *et al.*, 2007), as well as the interaction between these institutional variables or with economic shocks (Blanchard and Wolfers, 2000; Bassanini and Duval, 2009; Abbritti and Weber, 2010). We believe that this paper is the first one to examine the relationships between labour market institutions and unemployment *turnover* dynamics.

The paper is structured as follows. In Section 2, we present the basic relationship between unemployment stock and turnover, and describe the data as well as stylized facts. Section 3 examines the empirical relationship between labour

market policies and unemployment turnover. Section 4 defines and calculates labour market exposure to adverse shocks under different policy settings. Section 5 examines the existence of potential trade-offs between labour market exposure and steady-state unemployment, and calculates the two latter variables for each OECD country. Last section concludes.

2. DATA AND STYLISED FACTS

This section aims to shed light on the relationships between unemployment turnover and the rate of unemployment, then it describes the data and stylised facts.

2.1. The relationship between unemployment and unemployment turnover

The evolution of unemployment over time is conveniently described by a two-state model (employment-unemployment) that ignores inactivity and considers a fixed labour force.[1] Between two periods, the change in unemployment is simply equal to the number of workers being laid-off and falling into unemployment minus the number of unemployed workers finding a job. Formally, one has:

$$(1)\quad u_{t+1} - u_t = s_t.e_t - f_t.u_t = s_t.(1-u_t) - f_t.u_t$$

where u_t denotes the rate of unemployment, e_t the employment rate as a share of the labour force, s_t x$_t$ the unemployment inflow rate and f_t the unemployment outflow rate. The two latter variables are labeled as "unemployment turnover rates".

Let us now define steady-state unemployment. Unemployment is constant at steady-state, implying that there is an equal number of people entering or exiting unemployment. Using the above expression, steady-state unemployment can be expressed as:

$$(2)\quad u_t^* = \frac{s_t}{s_t + f_t}$$

Notice that steady-state unemployment changes over time, as unemployment inflow and outflow rates are not constant in general. Steady-state unemployment unemployment is therefore more precisely defined as the equilibrium value that unemployment would permanently reach, were inflow and outflow rates remaining constant.

Then, the observed unemployment rate can be related to unemployment turnover rates in a simple way: One simply assumes that steady-state unemployment can be used as a proxy for the observed unemployment rate as they are empirically not very different, so that:

$$(3)\quad u_t \approx u_t^*$$

[1] Taking into account inactivity would result in a three-states model (employment-unemployment-inactivity) as developed for instance by Blanchard and Diamond (1989), Burda and Wyplosz (1994) or Ponomareva and Sheen (2009). In this case, 6 series of transition rates would be involved instead of two, and these series are not available for a panel of OECD countries.

This approximation appears to be valid for all countries at all times, with the exception of Spain and Ireland during periods of very high unemployment (from the mid-1980s until the mid-1990s). The two variables are plotted against each other on Figure 1. There is a 0.972 cross-country and cross-time correlation between observed and steady-state unemployment.

Econometric analysis further reveals that steady-state unemployment is a linear transformation of actual unemployment with slope coefficient 1.03 and intercept -0.96. Hence, cross-country differences in actual unemployment are almost perfectly reflected by cross-country differences in steady-state unemployment, but one has to bear in mind that steady-state unemployment is on average about one percentage point lower than its observed counterpart. For instance, average steady-state unemployment is calculated at 9.8% in France between 1985 and 2010, while average unemployment equals 10.2%. The difference between steady-state and actual unemployment rates could be further explained by the way unemployment turnover rates are calculated (see below).

It follows that the relationship between the actual rate of unemployment and turnover rates can be approximated in the following way:[2]

$$(4)\quad u_t \approx \frac{s_t}{s_t + f_t}$$

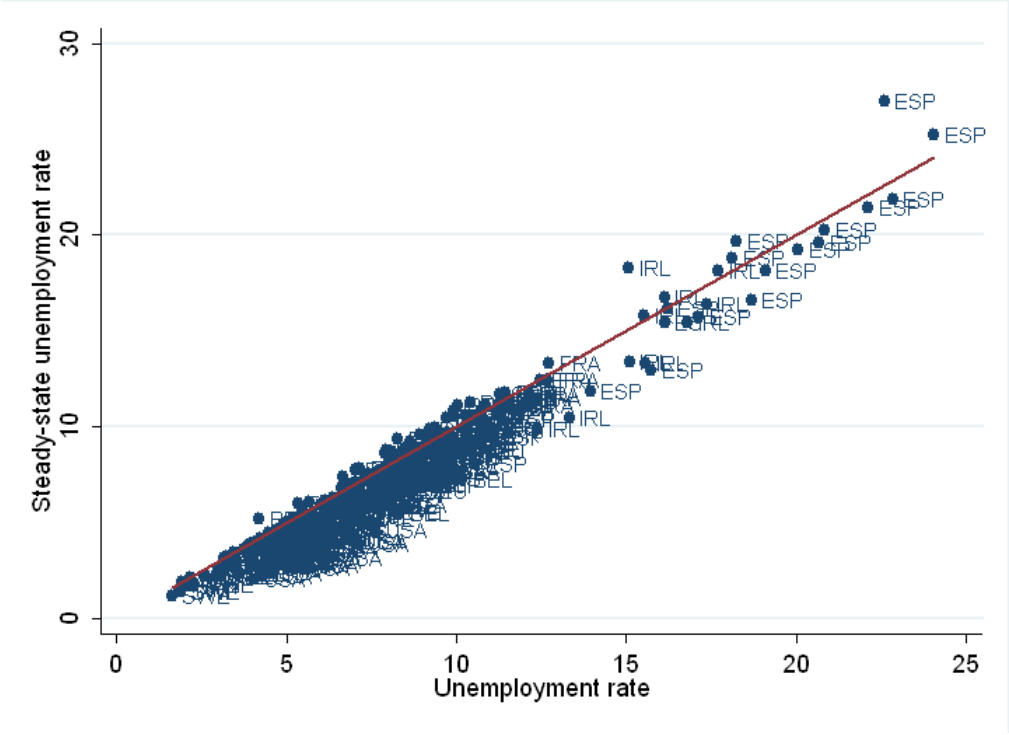

Figure 1 – An Approximation of the Observed Unemployment Rate

[2] Elsby et al. (2013) add a second-order term to this decomposition, which is neglected here. From an empirical perspective, Shimer (2012) shows that "the job finding probability has accounted for three-quarters of the fluctuations in the unemployment rate in the United States and the employment exit probability for one-quarter."

2.2. How does unemployment turnover look like across OECD countries?

Our measures of unemployment inflows and outflows are derived mainly from the OECD's Unemployment Distribution Database. This dataset provides information on the incidence of unemployment by duration: less than one month, 1 to 3 months, 3 to 6 months, 6 to 12 and over 12 months. The fraction of the labour force unemployed for less than *m* months is denoted by $u^{<m}$. The monthly inflow and outflow rates are calculated as proposed by Shimer (2012). On a first-step, one computes the monthly probability of exiting unemployment, simply equal to the stock of unemployed people observed during the following month, minus the number of people who have entered unemployment during the month, divided by the stock of unemployed people at the beginning of the month. On a second-step, one calculates the continuous-time equivalent outflow and inflow rates based on monthly duration statistics, f^1 and s^1 respectively, as in Shimer (2012) and Elsby et al. (2013). They are simply measured as:

$$(5)\quad \begin{cases} f^1 = -\log\left(\dfrac{u_{t+1} - u_{t+1}^{<1}}{u_t}\right) \\ s^1 = -\log\left(1 - \dfrac{u_{t+1}^{<1}}{e_t}\right) \end{cases}$$

Similar continuous-time series can be obtained on the basis of quarterly unemployment duration statistics.[3] Following Elsby et al. (2013), we select monthly-based series for countries in which the outflow rate is found to decrease over time, and quarterly–based series for other countries. The existence of negative duration dependence, namely the decline in the outflow rate along the unemployment spell, may potentially yields an overestimation of the outflow rate, and the underestimation of the steady-state unemployment rate by one percentage point, as noted above. The resulting dataset is complemented by other sources, including Murtin and Robin (2013), and is composed of 19 OECD countries for the period 1985-2010. In many ways, it is consistent with the data used in Elsby *et al.* (2013), but covers more countries.

Table 1 reports the average unemployment and turnover for all countries over the period, while Figure 2 provides a scatter diagram of the average unemployment inflow and outflow rates by country. It can be seen: *i)* that the average flow variables are strongly and positively correlated; and *ii)* that average worker flows are much larger in most English-speaking and Nordic countries than in other countries.[4,5]

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3 In this case $f^3 = -\frac{1}{3}\log\left(\frac{u_{t+3} - u_{t+3}^{<3}}{u_t}\right)$ and $s^3 = -\frac{1}{3}\log\left(1 - \frac{u_{t+3}^{<3}}{e_t}\right)$.

4 Moreover, there is generally a positive association between the coefficients of variation of the inflow and outflow rates. Among high-turnover countries, Nordic countries display much more volatility in unemployment turnover than English-speaking countries such as Australia, Canada, New-Zealand and the United-States.

5 A closer look at the variation in inflow and outflow over time reveals diverging trends. In some countries such as Canada, Denmark, Ireland, Italy, the United Kingdom and Spain, there has been a clear upward trend in outflow rates. Conversely, there seems to have been a downward trend in outflow rates in Belgium, Japan and Portugal since the early 1990s. In the US we retained the variable from Robin (2011), who does not apply any correction to the raw series to account for a break in the CPS around 1993 as Shimer (2012) and Elsby *et al.* (2013). As a result, one still observes a downward trend after 1993.

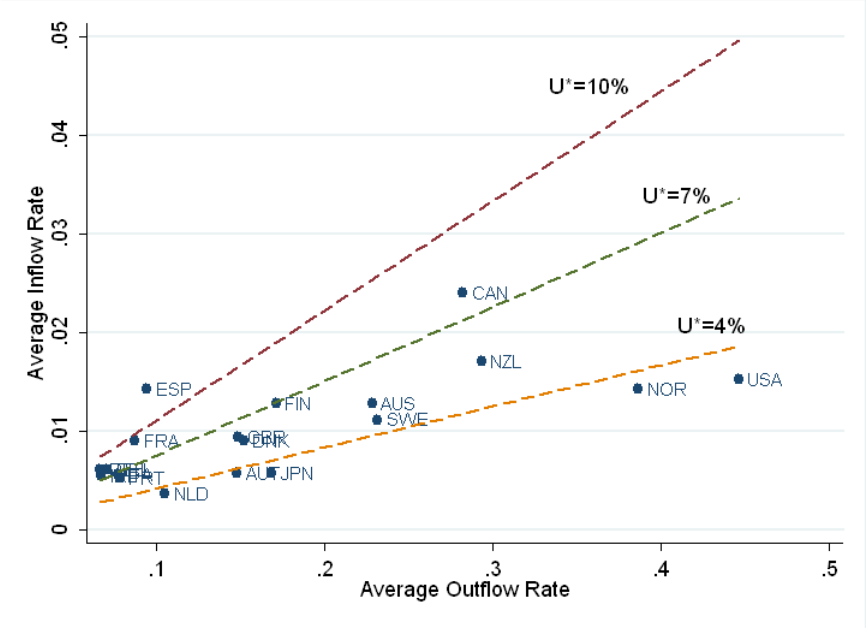

Figure 2 – Average Inflow and Outflow Rates

Moreover we reported on this graph the iso-curves of steady-state unemployment, namely the values of inflow and outflow rates for which a similar steady-state unemployment rate is obtained. These lines reveal an interesting feature: labour markets characterized by similar rates of unemployment can hide very different underlying turnover dynamics. For instance, the Netherlands, Austria and Japan display more or less the same rate of (steady-state) unemployment as Norway or the US, but the labour markets of the latter two countries witness far more turnover.

Table 1 – Descriptive Statistics

	Unemployment	Inflow	Outflow	Replacement rate	Benefits duration[a]	EP regular contracts	ALMPs[b]	Tax wedge	Minimum wage	Union density	Product market regulation
AUS	7.3	1.3	22.6	24.1	1.0	1.3	0.05	28.4	60.2	30.3	2.7
AUT	4.6	0.6	14.3	39.3	0.8	2.4	0.15	45.1	na	31.1	1.9
BEL	8.5	0.6	6.9	47.2	0.9	1.7	0.13	41.3	54.1	52.9	3.7
CAN	8.5	2.4	27.9	49.4	0.3	1.3	0.05	31.9	40.3	33.0	2.5
DEU	8.0	0.6	6.9	38.2	0.7	2.7	0.12	33.4	na	27.0	3.1
DNK	6.2	0.9	14.9	69.5	0.9	1.6	0.25	43.7	na	74.2	3.1
ESP	16.4	1.4	9.2	66.3	0.5	3.0	0.04	32.5	44.9	14.7	3.5
FIN	8.8	1.3	16.8	53.2	0.9	2.2	0.10	44.6	na	72.7	2.4
FRA	10.2	0.9	8.6	59.6	0.6	2.4	0.09	42.0	55.0	9.2	4.3
GBR	7.4	1.0	14.7	20.3	0.8	1.0	0.05	29.4	43.7	33.7	2.0
IRL	10.7	0.5	6.5	40.3	0.8	1.6	0.10	28.0	54.3	42.6	4.3
ITA	7.5	0.6	7.8	54.2	0.6	1.8	0.06	40.9	na	34.0	2.1
JPN	3.9	0.6	17.5	34.8	0.3	1.9	0.08	21.6	31.5	22.0	3.0
NLD	4.1	0.4	10.7	71.0	0.6	3.0	0.32	32.8	48.1	19.8	1.8
NOR	4.1	1.4	38.9	62.6	0.7	2.3	0.18	51.8	na	56.1	3.5
NZL	6.5	1.7	28.9	27.5	1.0	1.5	0.08	23.7	52.4	26.2	2.4
PRT	6.6	0.5	7.8	66.1	0.6	4.3	0.09	24.3	51.4	23.2	3.7
SWE	6.1	1.1	23.5	79.6	0.9	2.9	0.38	52.2	na	78.4	3.0
USA	6.0	1.5	44.8	30.0	0.5	0.2	0.03	23.4	35.6	13.9	2.1

[a]calculated as average replacement rate divided by initial replacement rate

[b]amount per person unemployed divided by GDP per worker, smoothed with Hodrick-Prescott filter

2.3. Labour market institutions

The database on unemployment turnover is complemented by a set of labour market policy and institutional variables. These series include: The initial (first-year) replacement rate of unemployment benefits; the average duration of unemployment benefits proxied by the ratio of the average (over five years) and initial replacement rates; the OECD index of employment protection for regular contracts;[6] the volume of active labour market policies per unemployed worker normalised by GDP per worker,[7] and its three main sub-components (public employment services denoted as PES, employment incentives and training); the tax wedge;[8] the OECD index of product market regulation; the share of workers that are members of a union (union density); the minimum wage as a share of the median wage.[9]

Table 1 summarises the country averages of each institution over the period. To some extent, countries can be broadly classified according to the emphasis put on protecting employment or on providing support to the unemployed through active and passive labour market policies.

- Nordic countries combine generous unemployment benefits with strong activation measures (supported by intensive job search assistance and training possibilities). Among these countries, Sweden and Finland also provide relatively strong job protection for employees on regular contract.
- A majority of Continental European countries combine strict employment protection with fairly generous support to the unemployed, mainly in the form of passive measures such as high unemployment income replacement rates. Many of them have strengthened active labour market policies during the 2000s.
- English-speaking countries generally combine weak employment protection with low to moderate income support for the unemployed. These countries typically put very little emphasis on active labour market policies.

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6 The analysis of dual labour market and the effect of employment protection for temporary contracts on unemployment goes beyond the scope of this paper.

7 In order to remove cyclical variations in ALMPs that result from cyclical unemployment variations, we apply a HP filter to the constructed series and use only the trend series in subsequent regressions. This procedure corrects for the endogeneity that arises from the fact that ALMP spending has traditionally been relatively insensitive to *cyclical* changes in the unemployment rate (OECD, 2009). It does not address the endogeneity problem that may arise when the variation in ALMP spending falls short of the variation in the *structural* rate of unemployment. This may be less of a problem since ALMP spending has traditionally been more responsive to changes in the structural unemployment rate. If ALMP spending nevertheless falls short of the variation in structural unemployment, this will bias the estimated impact of ALMP spending on unemployment downward.

8 The OECD tax wedge is a summary index of labour and personal income taxes. It was preferred to a simple labour tax index as the latter series is affected by a break in the late 1990s. However, our main results are largely unaffected if we replace the tax wedge by labour taxes.

9 We impute an average minimum wage for countries that do not display any official minimum wage and systematically introduce a dummy taking value 1 for the latter set of countries in the econometric analysis. Hence the coefficient on the minimum wage pertains to the set of countries displaying a minimum wage.

3. THE RELATIONSHIP BETWEEN LABOUR MARKET POLICIES AND UNEMPLOYMENT TURNOVER

In this section, we explore the empirical relationships between labour market policies and unemployment turnover series. We first estimate an empirical model to determine how policies affect the dynamics of turnover rates or, more specifically, how they shape the long-term level of turnover as well as the pace at which turnover rates return to equilibrium after a shock. Based on the estimated parameters, we then calculate the exposure of labour markets to adverse economic shocks and assess the influence of policies on the degree of labour market exposure.

3.1. Labour Market Policies and the Dynamics of Turnover Rates: Empirical Model and Estimation Results

A given policy may have a differential impact on turnover dynamics, depending on whether it affects its degree of sluggishness or its sensitivity to economic shocks. Sluggishness is a general characteristic independent of the magnitude of economic shocks. Sensitivity to economic conditions is the degree at which a given economic shock is transmitted to the labour market in terms of turnover variation.

Consider employment protection for instance. In theory, protective employment legislation may reduce job destruction over the business cycle and more particularly during acute phases of economic crisis (e.g. Bentolila et al., 2010), so that it should reduce (inflow) sensitivity to the business cycle. On the other hand, it may also make employers more hesitant to resume hiring when economic conditions improve, and hence it should increase (outflow) persistence over time on top of lowering the average rate of job creation.

Our analysis not only examines the channels through which labour market policies and institutions have an effect (inflow versus outflow), but also reflects on the type of effects at play. We retain three types of effects: Labour market policies having an effect on the steady-state levels of inflow and outflow rates (labelled as the “level” effect), on their degree of time persistence (the “persistence” effect) and on the sensitivity to business cycle shocks (the “sensitivity” effect transiting through the elasticity of the output gap). There is a tendency to associate persistence and sensitivity effects with long-term and short-term dynamics respectively, but this is inaccurate. Indeed, the separation between short-term and long-term effects is not so clear cut, as good or bad economic conditions (the output gap) are also persistent over time. Therefore, a policy mitigating an adverse economic shock over the short term also mitigates the ensuing long-term consequences of the downturn. Hence, our results can not be interpreted in terms of short-term versus long-term effects.

Our measure of business cycle shocks is the output gap constructed by the OECD. While it could be argued that the output gap contains some endogenous components resulting from a lower degree of labour utilization, we did not find lagged unemployment to be a negative and significant determinant of the output gaponce its lagged level is controlled for. Moreover, many economic studies use a (Hodrick-Prescott filtered) output gap as an input to unemployment dynamics (e.g. Bassanini and Duval, 2009). In practice, we estimate the following system where X stand for policy and institutional variables and Z for the output gap:

$$
(7)\quad
\begin{cases}
\log s_{i,t} = \underbrace{\rho^{s}_{i,t}}_{persistence} \log s_{i,t-1} + \left(1-\rho^{s}_{i,t}\right)\left(\underbrace{\alpha^{s}_{i} + \lambda^{s}_{t} + \sum_{j}\beta^{s}_{j} X^{j}_{i,t}}_{level}\right) + \left(\underbrace{\varphi^{s}_{0} + \sum_{k}\varphi^{s}_{k}(X^{k}_{i,t})}_{sensitivity}\right) Z_{i,t} + \varepsilon^{s}_{i,t} \\
\rho^{s}_{i,t} = \rho^{s}_{0} + \sum_{k}\rho^{s}_{k}(X^{k}_{i,t}) \\
\log f_{i,t} = \rho^{f}_{i,t} \log f_{i,t-1} + \left(1-\rho^{f}_{i,t}\right)\left(\alpha^{f}_{i} + \lambda^{f}_{t} + \sum_{j}\beta^{f}_{j} X^{j}_{i,t}\right) + \left(\varphi^{f}_{0} + \sum_{k}\varphi^{f}_{k}(X^{k}_{i,t})\right) Z_{i,t} + \varepsilon^{f}_{i,t} \\
\rho^{f}_{i,t} = \rho^{f}_{0} + \sum_{k}\rho^{f}_{k}(X^{k}_{i,t}) \\
Z_{i,t} = \rho^{Z}_{0} Z_{i,t-1} + \varepsilon^{Z}_{i,t}
\end{cases}
$$

In the above framework, labour market policies affect the long-term level of turnover rates through parameters β, the persistence of turnover through parameters ρ and their sensitivity to business cycle shocks through parameters φ. As regards unemployment, the steady-state unemployment rate is determined by the (difference between) labour market coefficients (β^{s}, β^{f}), and similarly for unemployment sensitivity parameters φ. Regarding persistence parameters, any policy increasing either inflow or outflow persistence coefficients (ρ^{s}, ρ^{f}) is deemed to increase unemployment persistence.[10] The output gap Z is in turn correlated across time, but its degree of persistence is assumed to be independent from policy variables.[11] Finally, policy variables are assumed to be strictly exogenous. The relaxation of the latter assumption and the instrumentation of current policies by their lagged levels in a GMM-type framework (assuming weak exogeneity) destroys the significance of all coefficients from the gap channel possibly due to weak instrumentation (i.e. coefficients φ), while leaving the others mostly unchanged.

The results from estimating this econometric system via non-linear ordinary least squares are reported in Table 2. Admittedly, many results are hard to pinpoint from a theoretical perspective, as there does not exist any fully-fledged job search theory reflecting upon the links between labour market institutions and the level, persistence and sensitivity of turnover rates (Box 3). Some of those results should therefore be contemplated from a purely empirical perspective. We comment on these findings by type of effects.

Three variables are found to raise the average level of unemployment through either higher inflows or lower outflows: higher tax wedges and minimum wages result in a higher inflow rate while more generous unemployment income support reduces the outflow rate. In the first two cases, a similar mechanism is at play: an increase in either of these two variables will have a direct negative impact on firms' profits, although in the case of the tax wedge, this is unless the effect is absorbed through lower pre-tax wages. The reduction in profit margins in turn makes firms more likely to be hit by exogenous reallocation shocks. As for the unemployment insurance, more generous benefits have a detrimental impact on employment as high replacement rate raises the reservation wage and makes unemployed workers more selective in accepting job offers. And, the longer the effective duration of benefits, the higher the risk

[10] In the wake of an adverse economic shock, any policy that increases inflow or outflow persistence maintains the inflow (respectively the outflow) above (resp. below) its steady-state, hence increasing unemployment persistence as well.

[11] In practice, it is very hard to disentangle policy effects on the output gap and those influencing the transmission of the output gap to unemployment turnover rates.

of a reduction in job-search intensity (though this effect just fail to be significant at the 10 per cent confidence level). These combined effects lead to a reduction in matching efficiency and a permanent decline in the outflow rate (Table 2, column 4). The adverse effect of higher replacement rates can be mitigated by strict and enforced job-search requirements and benefit conditionality. This is to some extent reflected in the positive effect of ALMPs on the outflow rate.

As shown in columns 3 and 6, more generous unemployment insurance reduces the persistence of inflow and outflow rates (only inflow in the case of benefit duration). This somewhat puzzling result can be the consequence of an adverse selection mechanism that generate a trade-off between the level and persistence effects of unemployment benefits on turnover: the higher the unemployment income replacement rate, the lower the long-term outflow rate, and hence the larger the share of lower-skilled workers trapped outside the labour market. Since this contributes to raise the average skill level of employed workers, they also tend to exit unemployment more quickly when laid-off, reducing thereby the persistence of turnover. The same reasoning prevails for the minimum wage, also found to reduce the persistence of turnover, and which creates barriers to entry in the labour market for low-skill workers.[12] The opposite mechanism prevails for ALMPs, which drive many low-skill workers out of unemployment under normal conditions, but increases the sensitivity of the outflow rate to economic conditions (with a coefficient almost significant at a 10% level. Interestingly, the selection mechanism receives some support from the applied job-search theory laid out in Murtin and Robin (2013), as explained in Box 1.

Another policy variable found to reduce persistence is the stringency of product market regulation. By allowing for higher profit rents, less competition-friendly product market regulation increases the scope for firms to absorb a squeeze in profit margins during downturns, making them less hesitant to respond to small improvements in economic conditions by immediate job creation. As for the negative effect of larger union density on persistence, it could reflect the favourable influence of greater coordination between firms and unions in wage bargaining on the speed at which the outflow rate returns to long-run level following an adverse shock (see Murtin et al., 2013).

Two policy variables contribute to raise the persistence of turnover rates and hence unemployment, namely the tax wedge and employment protection legislation. The effect of the tax wedge could be viewed as the counterpart of product market regulation, *i.e.* that higher labour taxes reduces profit margins and hence, the capacity for firms to adjust labour costs according to the phase of the business cycle, resulting in slower hiring during recoveries. In the case of tighter employment protection, as mentioned at the start of this section, high firing costs reduce the long-term rate of job destruction (though this effect is not found to be significant) but also make firms more hesitant to hire during recoveries, resulting in a slower return of the outflow rate to its long-term level.

[12] Two results need to be distinguished in the case of the minimum wage. The one described here concerns the effect of raising a minimum wage that is already in place. This is found to lower persistence. On the other hand, the results from Table 2 corresponding to the variable "no minimum wage" suggest that the introduction of a minimum wage generates more persistence in the outflow rate.

Table 3 - Policy and Institutional Effects Through Various Channels 1985-2010

Dependent variable:	**log s**			**log f**		
Channel:	**level**	**gap**	**lag**	**level**	**gap**	**lag**
	(1)	(2)	(3)	(4)	(5)	(6)
Initial gross replacement rate	0.216 (0.671)	-0.034 (0.037)	-0.983*** (0.218)	-2.902*** (0.654)	-0.066 (0.049)	-0.962*** (0.277)
Average benefits duration	-0.152 (0.448)	-0.007 (0.029)	-0.395** (0.161)	-0.763 (0.567)	-0.007 (0.033)	0.057 (0.188)
EPL regular	-0.036 (0.146)	-0.007 (0.005)	-0.060 (0.041)	-0.090 (0.179)	0.003 (0.006)	0.105** (0.041)
Active ALMP normalised	-0.009 (0.516)	-0.046 (0.045)	0.399 (0.347)	1.460** (0.633)	0.090 (0.056)	0.016 (0.315)
Tax wedge	0.032*** (0.012)	0.001* (0.001)	0.036*** (0.005)	0.022 (0.014)	0.001 (0.001)	0.025*** (0.005)
Minimum wage	2.663** (1.233)	0.114* (0.068)	0.263 (0.409)	-1.240 (1.421)	0.142 (0.091)	-1.010* (0.618)
No minimum wage	-0.255 (0.175)	-0.028*** (0.010)	-0.299*** (0.049)	-0.095 (0.241)	-0.044*** (0.013)	-0.406*** (0.080)
Union density	0.018 (0.011)	0.000 (0.000)	-0.005*** (0.002)	-0.003 (0.012)	0.000 (0.000)	0.000 (0.002)
PMR	-0.097 (0.063)	-0.000 (0.003)	0.002 (0.011)	-0.069 (0.066)	0.006 (0.004)	-0.060** (0.026)
Output gap		-0.009** (0.004)			0.031*** (0.006)	
Lagged dependent variable			0.734*** (0.034)			0.696*** (0.035)
Time effects		Yes			Yes	
Country fixed-effects		Yes			Yes	
R^2		0,96			0,97	
N		368			368	

Box 1 – Steady-state Unemployment and its Volatility (Murtin and Robin, 2013)

Murtin and Robin (2013) are to the best of our knowledge the first study looking at the effects of a large number of labour market policies on both the level and the cyclical dynamics of unemployment. They use Robin (2011) seminal model based on endogenous job destruction. Workers differ by ability and yield different profits to firms when employed. In a downturn, the surplus generated by low-skill workers eventually becomes negative and they are automatically laid-off. If the distribution of ability displays some thickness at its left tail, a small productivity shock is able to generate a lot of job destruction. This simple amplification mechanism provides an explanation to the "unemployment volatility puzzle" (Shimer, 2005, Pissarides, 2009).

This framework is complemented by the introduction of policy reforms that change the structure of the labour market. In practice, key parameters governing the dynamics of unemployment and turnover depend on a set of labour market policies. These structural parameters are the rate of exogenous job destruction (s), matching efficiency (ϕ) and the cost of posting vacancies *c*. In practice, they allow the replacement rate and ALMPs to determine job destruction and matching efficiency, with the view that these institutions determine the degree of job search intensity and eventually the quality of the matching between employers and employees. Then, they allow the tax wedge and product market regulation to determine job creation through the cost of posting vacancies, as well as the exogenous job destruction rate. The model is estimated for 9 OECD countries between 1985 and 2007. The most effective labour market policy reforms, in terms of reducing steady-state unemployment, are found to be active labour market policies, and unlike results found in this study, product market regulation.

Using this model, it is interesting to look at the change in steady-state unemployment and its volatility when core parameters, namely *s*, *c* and ϕ are shifted by 10% in the direction of increasing unemployment. The following Table reports the average result calculated across the nine OECD countries considered in the study over the period 1985-2007, bearing in mind that the results are qualitatively similar across countries.

	Benchmark	Absolute change following a 10% increase in:		
		ϕ	s	c
Steady-state unemployment (in %)	8,49	0,95	0,71	0,41
Coefficient of variation (in %)	10,72	-0,79	-0,33	-0,37

Strikingly, any increase in steady-state unemployment is associated with a decrease in volatility as measured by the coefficient of variation. The explanation is straightforward: the bulk of unemployment is composed of low-skill workers who generate low profits and are therefore under the threat of being laid-off if economic conditions deteriorate. In this model, pro-employment labour market reforms change the skill composition of employed workers and therefore modify the vulnerability to risks in opposite direction, with lower unemployment being associated with higher labour market exposure.

3.2 Assessing Labour Market Exposure To Economic Shock

Based on the results reported in Table 2, this sub-section provides calculations of the exposure of labour markets to adverse economic shocks as well as an assessment of the influence of policies on the degree of labour market exposure.

Defining Labour Market Exposure

We define labour market exposure to adverse shocks as the cumulated amount of unemployment in excess of the initial steady-state unemployment level following an adverse shock, divided by the initial steady-state unemployment rate. Defined as such, labour market exposure appears to be a relative rather than absolute concept of "unemployment

at risk", in the sense that it captures the cumulated relative variation in unemployment over time, rather than its absolute value. We believe that a relative concept is more relevant to the problem faced by a representative agent that contemplates unemployment fluctuations along the business cycle.

Our proposed definition is best illustrated on Figure 3, which depicts the evolution of steady-state unemployment while assuming an average value of labour market policies. At the initial period, a one standard-deviation adverse shock is hitting the labour market previously at equilibrium (i.e. zero output gap). This corresponds to a sudden trough in the output gap that returns gradually to zero. Because of labour market sluggishness, the (steady-state) unemployment rate does not adjust immediately to economic conditions. Actually, it takes four years to reach its maximum level (+1.1 percentage points) on the figure below, and another 6 years to close half of the way back to equilibrium, which is identical to the initial unemployment level as there is no policy change in this simulation.

Labour market exposure is then simply defined as the area under the unemployment curve. The cumulated amount of cyclical unemployment is then normalized by the initial (or final) level of steady-state unemployment. On the Figure below, initial unemployment is at 7.7% and labour market exposure is equal to 1.45, implying that, cumulated over time, the adverse shock has affected as much as 1.45x7.7 = 11.2% of the labour force.

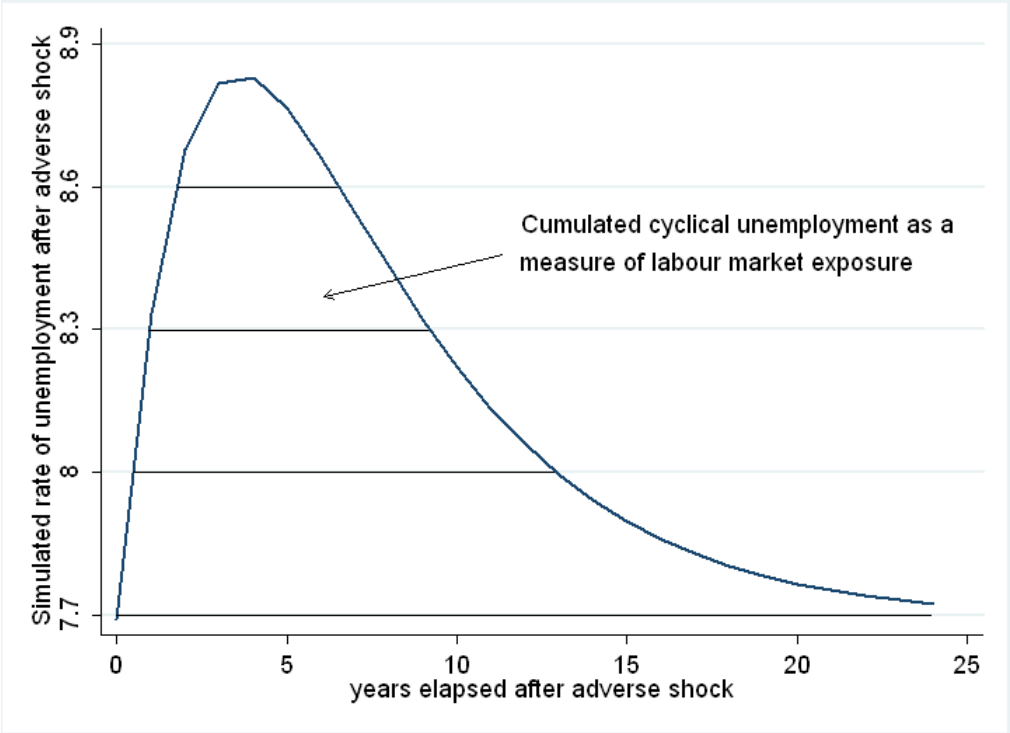

Figure 3 – Unemployment Dynamics in an Average OECD Country 1985-2010

The impact of LMPs on labour market exposure

In a second step, we redo the former simulation under different labour market policy settings. We consider an identical adverse shock across simulations, add one standard deviation to each policy separately and compare the

resulting measures of labour market exposure. As policies differ across simulations, initial and final steady-state unemployment would normally differ across simulations everything else equal. To obtain the same starting values of inflows, outflows and unemployment, we do not change the value of policies in the level component, and simply allow persistence and sensitivity effects to be at play. The level effect will be examined subsequently.

To simulate the evolution of inflows, outflows and steady-state unemployment following a shock, one needs to choose a predictor, namely a statistical model. We examine two predictors. In a conservative approach, we restrict to zero the non-significant (at a 10% confidence level) coefficients of policies depicted in Table 2.[13] Alternatively, we let the data speak and keep all significant and non-significant coefficients described in Table 2, using thereby a fully unconstrained model. The latter model has pros and cons. It makes use of all available information and accounts for coefficients that were almost significant at a 10% confidence level; on the other hand, some calculated effects may rely on non-significant underlying coefficients, which may cast doubts on the calculated labour market exposure. We still view this model as our preferred one.

Figure 4 describes the results obtained from the simulation with unconstrained coefficients. We also plot the benchmark with no policy change. First, three policies or institutions, namely the duration of unemployment benefits, union density and product market regulation generate almost no change vis-à-vis the benchmark. These policies are therefore essentially neutral in terms of labour market exposure.

Second, labour market exposure to the adverse shock largely differs across policy settings. A larger tax wedge or volume of ALMPs and tighter employment protection are associated with larger exposure to adverse shocks. Conversely, a larger minimum wage or replacement rate are conducive to smaller exposure. These findings are in line with the results presented on Table 2.

In terms of magnitude, policies that increase labour market exposure the most are the tax wedge, followed by employment protection and ALMPs. Policies that reduce labour market exposure the most are the replacement rate followed by the minimum wage.

Notice that policies associated with a larger short-term exposure, as measured by the peak of unemployment observed within the first five years after the shock, also increase long-term exposure as defined by steady-state unemployment levels after, say, fifteen years. In other words, there does not appear to be diverging results across shorter or longer time horizons.

Table 3 examines whether the above results are robust to the choice of a more conservative model where only significant coefficients would be taken into consideration. As a result, active labour market policies fail to have any effect on labour market exposure, while the effect of other policies is generally significantly lower, or is larger but by a small margin.

The main conclusions do hold: the tax wedge and employment protection greatly increase labour market exposure, whereas the minimum wage and the replacement rate diminish it. The effect of product market regulation switches sign across the two models, so it can be viewed as being quite fragile. Other policies have negligible effects on labour market exposure.

[13] In this case, the constants are adjusted so as to start from the same values of inflows and outflows.

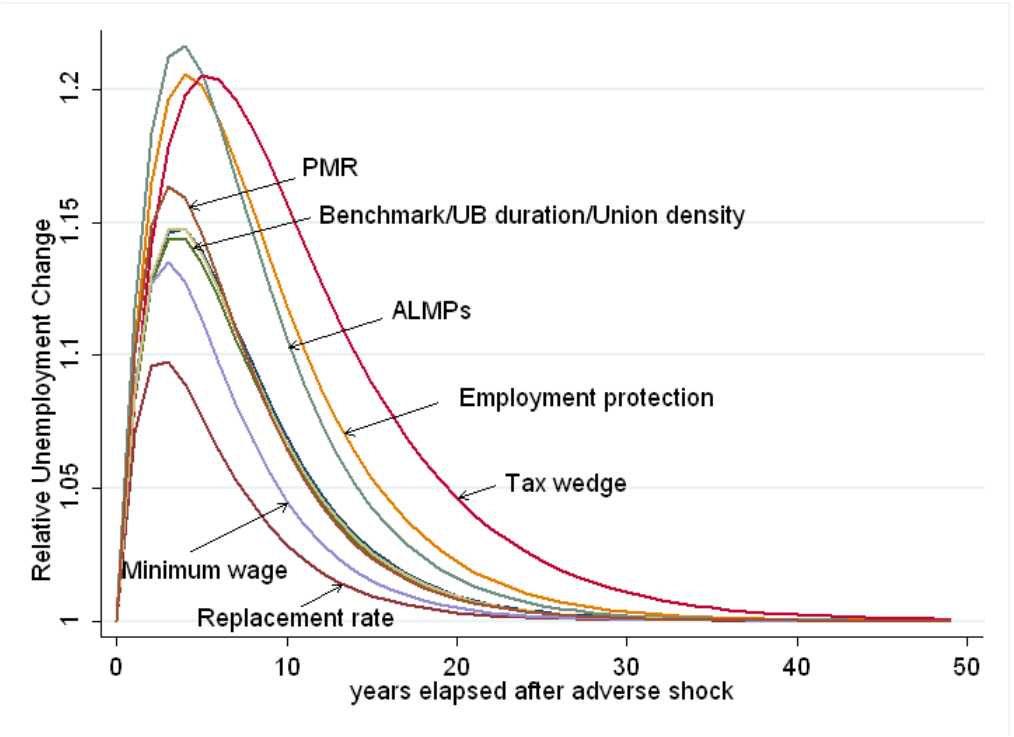

Figure 4 – Labour Market Exposure under Various Institutional Settings

Table 3 – The Policy Determinants of Labour Market Exposure

	Labour Market Exposure (cumulated increase in unemployment divided by initial unemployment)	
	All coefficients	Only significant coefficients
Benchmark	1,45	1,45
	In variation relative to benchmark value	
Initial replacement rate	-0,68	-0,55
Average benefits duration	-0,06	-0,09
EPL regular	0,85	0,54
ALMPs	0,73	0
Tax wedge	1,45	0,60
Minimum wage	-0,33	-0,43
Union density	-0,02	-0,11
PMR	0,03	-0,21

4. IS THERE A TRADE-OFF BETWEEN LABOUR MARKET EXPOSURE AND STEADY-STATE UNEMPLOYMENT?

In this section we calculate the variation in steady-state unemployment after policy reforms and examine the potential existence of trade-offs between labour market exposure and steady-state unemployment among OECD countries. To that aim, we use the statistical model (7) estimated in Table 2.

4.1. The impact of labour market policies on steady-state unemployment

As before, we consider a country endowed with average labour market policy settings initially at steady-state. Then, we increase each labour market policy separately by one standard deviation and calculate the new steady-state unemployment after a large number of periods have elapsed. As in the former section, we test two predictors, one with unconstrained coefficients and another with non-significant coefficients set to 0.

Table 4 reports the resulting variation in steady-state unemployment corresponding to each policy reform, and replicates former results from Table 3.

Table 4 – Labour Market Exposure versus Steady-state Unemployment

	Labour Market Exposure (cumulated increase in unemployment divided by initial unemployment)		Steady-state Unemployment	
	All coefficients	Only significant coefficients	All coefficients	Only significant coefficients
Benchmark	1.45	1.45	7.7	7.7
	In variation relative to benchmark value			
Initial replacement rate	-0.68	-0.55	5.2	4.7
Average benefits duration	-0.06	-0.09	1.0	0
EPL regular	0.85	0.54	0.4	0
ALMPs	0.73	0	-1.1	-1.1
Tax wedge	1.45	0.60	0.8	2.6
Minimum wage	-0.33	-0.43	2.9	1.9
Union density	-0.02	-0.11	3.8	0
PMR	0.03	-0.21	-0.2	0

As expected, reforms of the replacement rate, benefits duration, employment protection, the tax wedge, the minimum wage and union density are conducive to higher unemployment, while ALMPs reform drives unemployment down. Only the effects of the replacement rate, ALMPs, the tax wedge and the minimum wage can be viewed as robust to the choice of a more conservative predicting model. Unexpectedly, tighter product market regulation is associated with lower unemployment, but the effect is small and not robust.

For each policy reform, Figure 5 displays the associated variation in labour market exposure relative to benchmark as calculated in the previous section, with respect to the variation in steady-state unemployment described above. For this Figure, the unconstrained predicting model was selected. This graph illustrates in a simple and intuitive way whether some labour market reforms are associated with lower unemployment at the expense of higher vulnerability to economic shocks, our key economic policy issue.

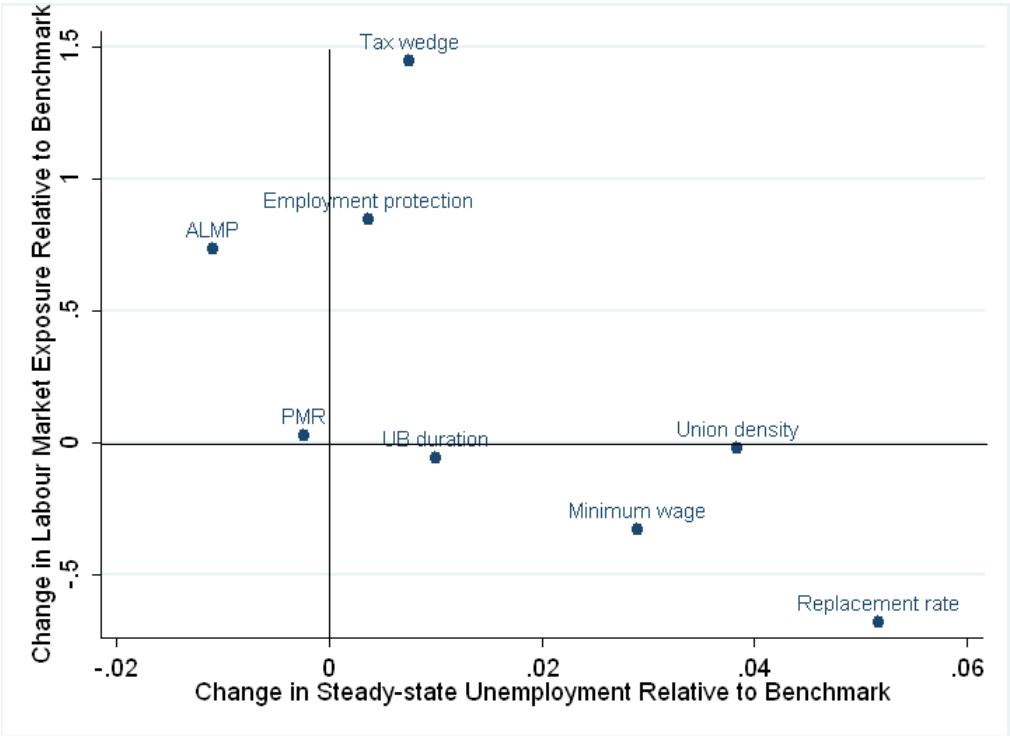

Figure 5 – Labour Market Exposure versus Steady-state Unemployment

Note: calculations based on the statistical model with all coefficients as given by Table 4.

Three trade-offs seem to be at play, which mirror the selection mechanism described previously. By increasing job search intensity, a larger volume of ALMPs lower steady-state unemployment but also increase turnover of low-skilled workers and hence raise labour market exposure. A higher minimum wage and replacement rate have exactly the opposite effect. Only the two latter policies seem to involve real trade-offs as suggested by the use of a more conservative model.

Figure 5 further illustrates two "win-win" policy reforms based on the job creation mechanism, namely the reduction in the tax wedge and in employment protection, which would be conducive to both lower steady-state unemployment and labour market exposure. Intuitively, both reforms may raise ex-ante profits for firms and boost job creation, both at the steady-state and during phases of economic recovery, which is critical to reduce labour market exposure. However, as often underlined in the literature (e.g. Cahuc and Postel-Vinay, 2002), loosening employment protection is unlikely to generate large reduction in unemployment at the steady-state, so that only tax wedge reduction may be viewed as a real win-win reform.

Finally, two other factors are related to higher steady-state unemployment but do not alter labour market exposure, namely benefits duration and union density.

4.2. Labour market exposure and steady-state unemployment among OECD countries

Let us now examine how OECD countries fare both in terms of labour market exposure and steady-state unemployment. To that end, we replicate the two latter simulations at the country level. First, we calculate steady-state unemployment for each country by setting the output gap to zero and by setting each policy and institution at its country-specific average over the period. Figure 6 compares the predicted steady-state unemployment to the average observed one. The correlation is very high so that our constructed steady-states appear to be credible.

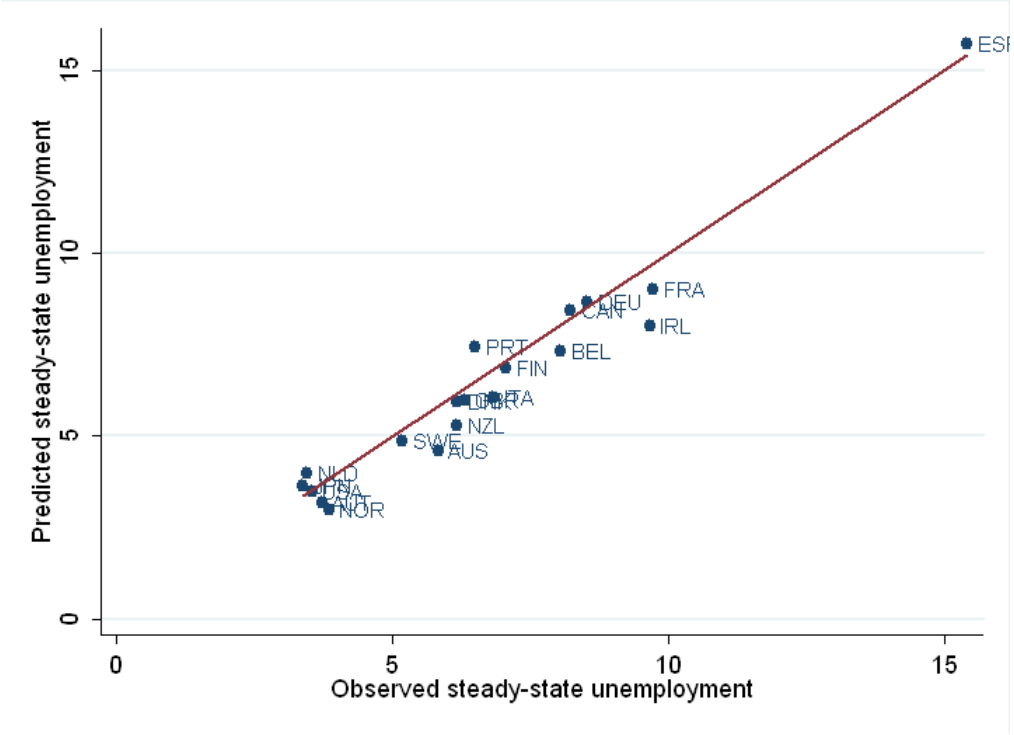

Figure 6 – Predicted versus Observed Average Steady-state Unemployment

Second, we impose to each country a common adverse shock that gradually returns to zero and calculate the implied labour market exposure. As above, each policy is set at its country-specific average. Notice that each country displays its specific steady-state unemployment level, which does not mechanically inflate or reduce our measure of labour market exposure, as the latter is normalized by the steady-state unemployment level.

Figure 7 situates OECD countries in the dual space of labour market exposure and steady-state unemployment. Strikingly, there does not appear to be any cross-country correlation between labour market exposure and steady-state unemployment.

Countries with high labour market exposure include some English-speaking countries such as Australia, the US, Canada and New-zealand, which tend to have low replacement rate and/or minimum wage, but also Continental European countries such as Belgium and France that are characterized by relatively high tax wedge and tight employment protection.

Conversely, countries with low labour market exposure are primarily composed of Nordic countries. In those countries, relatively large replacement rate and loose employment protection appear to mitigate the effects of the high tax wedge in terms of labour market exposure.

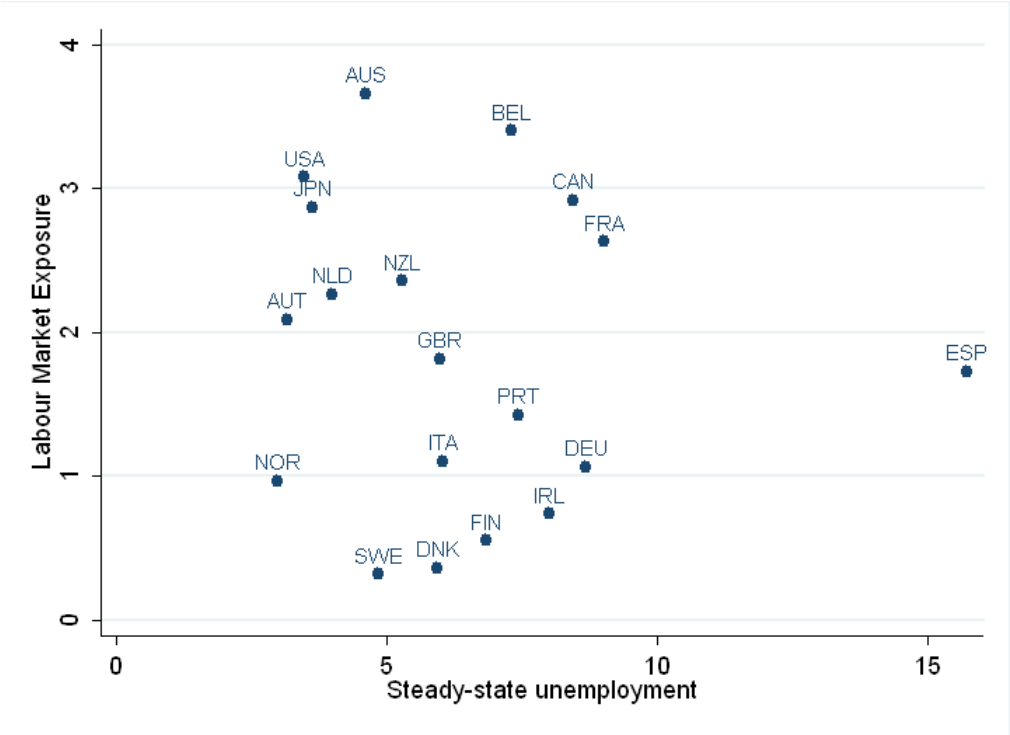

Figure 7 – Labour Market Exposure and Steady-state Unemployment among OECD Countries 1985-2010

5. SOME IMPLICATIONS FOR THE DESIGN OF LABOUR MARKET POLICIES

The results from the empirical analysis point a number of hindsights as regards the design of labour market policies that takes into account not only the long-run impact on flows in and out of and unemployment but also on the short- to medium-term performance, in particular following an adverse shock. This section focuses on what the analysis might suggest in terms of policy settings that could improve the resilience of the labour market in the short and

medium terms while contributing to high employment rates in the longer term. More specifically, the results from the empirical analysis raise questions about the desirability of engaging into structural policy fine-tuning according to economic conditions so as to ease trade-offs.

Of the policy variables included in the analysis, three point to a potential trade-off between reducing the persistence of unemployment following an adverse shock and achieving a low steady-state unemployment: unemployment benefits, the minimum wage and, to a lesser extent, active labour market policies. The first two are found to lower unemployment persistence but at the expense of a higher long-term level. One difference between these two is that unemployment benefits permanently reduce the outflow rate while a high minimum wage appears to raise trend unemployment through a higher inflow rate. Active labour market policies have the opposite effect, *i.e*. to lower steady-state unemployment, via a permanently increased outflow rate, but at the cost of raising persistence (although the latter finding is not robust).

Unemployment benefit programmes

The generosity of unemployment benefits exerts an influence on steady-state unemployment by raising reservation wages, reducing job search intensity and making wages less sensitive to unemployment. The results reported above (Table 2, column 4) corroborate earlier evidence that more generous unemployment benefits, through either higher replacement rates or extended duration, raise unemployment by lowering the outflow rate.[14] This issue is particularly relevant considering that one of the measures adopted in many countries in response to the crisis has been an increase in the level and duration of benefits. Indeed, many studies have found the average length of unemployment spells to be significantly influenced by the duration of unemployment benefits through duration dependence effects, *i.e*. where the probability of moving from unemployment to employment diminishes with the length of the jobless spell. [15]

We mainly interpreted the negative effect of more generous unemployment insurance on unemployment persistence as the consequence of a selection mechanism, whereby low-skill workers are trapped into unemployment on a permanent basis. There may well be other interpretations to our findings. For instance, income support could play the role of automatic stabiliser, as higher replacement rates help to mitigate the propagation of adverse shocks by limiting their impact on aggregate demand. This suggests that one avenue to reinforce the stabilising properties of unemployment benefit – while limiting the risks of significant increases in steady-state unemployment -- is to extend the coverage of unemployment insurance programmes so that it reaches most or all employees.

On the other hand, it is clear that where sizeable benefits are accessible over a lengthy period, a tightening of generosity would help to minimise the risks that unemployment stays permanently higher. However, in countries

14 The results from Table 2 show that only the replacement rate effect could be found as significant. In principle, the separation of the measure of unemployment benefit into the initial replacement rate and benefit duration is meant to control for the view that generous benefits may not have much of an impact if provided over a short period only. In practice, however, the initial replacement rate measures the average benefit rate over the first 12 months, whereas evidence from micro data suggests that the probability of exiting unemployment falls significantly already after 3 or 4 months of unemployment. Earlier evidence has shown that benefit duration has a stronger impact on the length of unemployment spells than the reduction in replacement rates (Lalive, van Ours and Zweimuller, 2005)

15 See Krueger and Mueller (2010) for a survey of the evidence. For example, recent estimates have suggested that the combined federal-state extension of benefit in the United States from an average of 26 weeks to 99 weeks (or 90 weeks on a national average) in response to the crisis could, if maintained, raise the average length of the unemployment spell by between 0.5 to 1.2 weeks (Aaronson *et al.*, 2010).

where the pace of output growth is still hardly sufficient to generate net job creation, let alone absorb an expansion of the labour force, maintaining the generosity of unemployment benefits – including as regards the duration – appears desirable, lest the risk of labour force withdrawal and dependence on other forms of benefits. Again, this points to the potential usefulness of designing unemployment insurance systems with built-in flexibility and state-contingent features so as to reinforce the automatic stabilisation properties.

In this context, one example of a policy that is desirable in normal circumstances but may turn out to be less helpful during recession followed by a weak recovery is firm-based experience rating. This mechanism can play a useful role in the long run to ensure that firms and workers contribute to the funding of resources for agencies in charge of helping with the redeployment/retraining of laid-off staff and to provide them the right incentives vis-à-vis their use of the unemployment insurance system (in particular avoiding abuses). However, experience-rating may leave firms more reluctant to hire in the initial phase of a recovery, especially when the latter is weak and uncertain, contributing to raise the risk and incidence of long-term unemployment. The possibility of temporarily suspending experience rating in the immediate aftermath of serious downturns could therefore be explored as a mean to raise churning at a time when it is most needed.

Another example of a programme which can be operated through unemployment insurance and whose effectiveness is contingent on the state of the economy is the subsidization of short-term working that was widely implemented across OECD countries in the aftermath of the crisis. The main aim of these programmes is to preserve jobs in firms that experience temporarily low demand by encouraging job sharing, while also providing income-support to workers who acknowledge reductions in hours worked (Hijzen and Venn, 2011). Short-term working schemes can be best thought of as a form of job subsidy. These subsidies can be justified insofar as they help preserve specific human capital in the wake of major but temporary economic shocks. Under similar conditions, they can avoid the hiring, firing and vacancy costs that firms would bear if they were forced to lay off and rehire workers with a similar profile. The use of such schemes with varying success across countries during the crisis has demonstrated that having such scheme in place and ready to be activated improve their timeliness and effectiveness (Balleer et al., 2012).[16] One challenge is to achieve a design that minimises the risk that such schemes hamper productivity by keeping excessive resources in firms and sectors that should be shrinking.

Active labour market policies

The results regarding the impact of spending on active labour market policies also confirm earlier evidence showing that the adverse effects of high unemployment benefit levels and duration on work incentives can to some extent be mitigated by a combination of activation measures and benefit conditionality. However, since public funds allocated to activation programmes is typically only partly adjusted (if at all) to reflect changes in labour market conditions, spending per unemployed worker often falls in economic downturns, especially so in the case of severe recessions. There is thus a case for ensuring that in a context of persistently weak recovery, resources devoted to job-search assistance be maintained or further beefed-up, in particular in countries where the average caseload per staff has risen

[16] Cahuc and Carcillo (2011) evaluate that a one point of percentage increase in short-time take-up rates is associated with a decrease of one point of percentage in unemployment and an increase of one point of percentage in employment. They also highlight the potential cost of these programmes and suggest to use experience ratings for employers.

substantially during the crisis given the sharp increase in registered jobseekers. Also, even though the overall effectiveness of training programmes in providing a sustained exit from unemployment remains unclear – as illustrated by the finding that they contribute to raise both the inflow and outflow rates -- they may help to reduce the incidence of mismatch and limit the risk of skills erosion. This is especially the case of opportunity cost of spending time in training – *i.e*. reduced job search intensity – is lower during downturns.

However, both types of active labour market programmes involve significant budgetary costs, clearly a constraint for many countries, not least those confronted to high risk of unemployment persistence. For instance, taking the above results at face value, an increase of around 0.4 percentage points of GDP would be required to reduce steady-state unemployment by one percentage point (Table 4, column 4). This raises the question of the extent to which resources should be concentrated on cases that stand better chances to find a match, which in principle would argue for focusing on those with relatively short unemployment spells duration, despite the risk of deadweight loss. This may be what happens *de facto* in the case of increased spending on job-search assistance, insofar as the additional resources would largely be aimed at new caseloads. In the case of training programmes, a case could be made for focusing efforts on the long-term unemployed but this entails a higher risk of failure.

Labour taxation and the minimum cost of labour

The potentially high costs of activation programmes also raise the issue of funding, and hence of taxation, including on labour. Yet, the results reported above illustrate the potential for reduction in the tax wedge to lower both the long-term level and persistence of unemployment in response to shocks. For instance, a reduction of around 4 percentage points in the labour tax wedge could on average induce a decline of one percentage point in unemployment (Table 4, column 4). While cuts in payroll taxation might thus help enrich the job content of a recovery following a downturn, such measures may not be feasible from a public finance perspective, unless introduced as part of a revenue-neutral tax reform package.[17]

In some countries with relatively high minimum wages, cuts in payroll taxes targeted on low-income earners have been used as a means to reduce the minimum cost of labour and boost demand for low-skilled labour. The results shown above provide some evidence that excessively high minimum wages may result in a permanently higher steady-state unemployment. As mentioned above, the empirical evidence on the impact of the minimum wage is mixed. Set at an appropriate level, and combined with in work benefits, a statutory minimum wage may raise labour force participation at the margin, without adversely affecting demand, thus having a net positive impact especially for workers weakly attached to the labour market. However, where it is viewed as being excessive, governments have found politically easier to achieve reductions in the minimum cost of labour relative to the mean or median through targeted cuts in payroll taxes, despite the higher budgetary cost. In principle, considering that a higher minimum wage is also found to reduce the persistence of unemployment, the possibility of adjusting its level according to economic circumstances could also be explored. In practice, it may not be desirable insofar as the apparent stabilising property

[17] Based on recent empirical work, one prime candidate among potential tax bases would be immovable properties (Arnold et al., 2011), but consumption or environmental taxation could also be considered. Even though the consumption tax can be seen as part of the labour tax wedge, its broader base would imply that a revenue neutral shift from labour taxes and social contributions towards consumption taxation would still reduce the wedge.

reflects primarily the maintenance in long-term unemployment of larger fraction of low-skilled workers, and hence a more rapid return of the outflow rate to a low permament level.

Employment protection legislation

The results reported above also provide further evidence that if strict employment protection legislation on regular contracts do not appear to have a robust and significant impact on steady-state unemployment, it may nonetheless have adverse indirect effects by raising its persistence following an adverse shock. This comes from a persistenly lower outflow rate and hence a higher incidence of long-term unemployment, which stem from lower sensitivity of wages to labour market conditions. As an attempt to address the persistence effect, a number of countries (*e.g.* Belgium, France, Germany, Italy, Netherlands, Portugal, Spain and Sweden) have in the past encouraged the development of dual systems of employment protection, via a a gradual loosening of restrictions in the use of temporary contracts while maintaining relatively strong protection on permanent contracts. One motivation has been to improve access of long-term unemployed (outsiders) to a parallel job market where wages may be set more flexibly, while preserving the power of those enjoying strong protection (insiders). [18]

The experience from Spain -- where the share of workers on temporary contracts reached the highest proportion among countries with dual systems – suggests that a dual protection system may exacerbate the pro-cyclicality of the outflow rate. Indeed, the reform of employment protection implemented in the 1990s in that country contributed to significantly boost the rate of exit of unemployment, which basically doubled during the period of steady growth in domestic demand (roughly from the mid-1990s to the mid-2000s). But the outflow rate also fell rapidly and sharply during the crisis, even by comparison to other countries facing a similar decline in output during the initial phase of the crisis.[19] This suggests that aside from raising equity issues, dual protection systems may have the additional drawbacks of depressing the unemployment turnover in periods where it most needs to be boosted.

6. CONCLUSION

The contrasting labour market performance across countries during the initial phase of the crisis has raised the question of whether some policies that may be detrimental to employment or productivity in the long-run, may nevertheless be desirable in the short run to cushion the effects of a recession. Conversely, there is a possibility that policies which are desirable in the long run might be counter-productive at time of crisis, for instance by contributing to the persistence in the unemployment inflow and outflow rates.

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18 One analysis based on the examination of earnings at the individual level has found that employees on temporary contracts earned on average substantially lower wages relative to those on permanent contracts, even in the case of individuals with similar education and experience.

19 This outcome was consistent with the prediction from studies arguing that countries pursuing such reforms may only benefit from a transitional "honeymoon effect" in the form of job-rich growth during a period of economic expansion, but that is unlikely to yield a sustained increase in the turnover rate (Boeri and Garibaldi, 2007). Moreover, there is evidence that such dual regimes may be conducive to higher unemployment in the long run and can have the effect of amplifying the short-term response of unemployment to shocks (e.g. Bentolila et al. 2010).

This paper has examined the vulnerability of labour markets to adverse economic shocks. Labour market exposure is defined as the cumulated amount of excess unemployment generated by a shock until unemployment returns to its steady-state. The influence of labour market policies on labour market exposure, also calculated country by country, is estimated using a panel of 19 countries covering the period 1985-2007 to assess. We find that policies lowering the reservation wage such as less generous unemployment insurance, more active labour market policies or a lower minimum wage imply policy trade-offs . Conversely, reducing the tax wedge is conducive to both lower steady-state unemployment and lower labour market exposure.

More generous unemployment benefits has been found to raise steady-state unemployment through higher reservation wage effects, but it is also associated with a faster recovery in the outflow rate and lower unemployment persistence. Conversely, there is some evidence that a relatively high amount of resources devoted to active labour market programmes help reduce steady-state unemployment but also contribute to stronger persistence following a shock. The latter effects could reflect a selection mechanism: for instance, higher spending on ALMPs raise the sensitivity of the unemployment turnover rate to economic fluctuations, notably by helping to maintain in the labour market lower-productivity worker who are more prone to be laid-off during downturn, exacerbating thereby the cyclicality of the outflow rate.

In each case, the evidence provides an argument for adjusting settings according to the state of the economy so as to reinforce the stabilising (or offset the de-stabilising) properties while avoiding to raise trend unemployment. In the case of the unemployment income insurance, this could mean for instance temporarily raising the replacement rate and extending the duration of benefits, as has been done in response to the crisis in a number of countries (*e.g.* Canada and the United States). As regards ALMPS, government should seek to ensure that budget increases are commensurate to the rises in caseloads during downturn so as to avoid a reduction in effective support when it is most needed.

Evidently, the timing of these adjustments is crucial. As with macro policies, discretionary structural policy changes are by no means easy to implement in a timely fashion, with risks of having a de-stabilising effect. For instance, one lesson from the experience with short-time working schemes is that having the mechanism in place and ready to be activated at the start of the crisis can make a difference on the effectiveness of the measure. In this context, the pros and cons of designing some labour market policies with more built-in flexibility mechanisms so as to enhance their stabilizing properties through rules-based adjustments rather than discretionary changes should be explored and perhaps experimented on a small scale.

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APPENDIX ON DATA SOURCES

Unemployment, labour force, inflow and outflow rates

Unemployment rate: Unemployed workers as a share of the labour force, in %. Aggregate rates refer to the 15-64 age group.

Source: OECD Database on Labour Force Statistics; OECD, Annual Labour Force Statistics.

Unemployment inflow rate: The pace at which workers become unemployed.

Source: **OECD Unemployment Distribution Database.**

Unemployment outflow rate: The pace at which unemployed workers leave unemployment.

Source: **OECD Unemployment Distribution Database.**

Policy and institutional indicators

Initial replacement rate: average unemployment benefit replacement rate during the first year of unemployment across two income situations (100% and 67% of APW earnings) and three family situations (single, with dependent spouse, with spouse in work).

Source: OECD, Benefits and Wages Database

Average replacement rate: average unemployment benefit replacement rate across two income situations (100% and 67% of APW earnings), three family situations (single, with dependent spouse, with spouse in work) and three different unemployment durations (1st year, 2nd and 3rd years, and 4th and 5th years of unemployment).

Source: OECD, Benefits and Wages Database.

Average benefits duration: ratio of average to initial unemployment benefit replacement rate (see above).

Source: OECD, Benefits and Wages Database.

Tax wedge: Tax wedge between the labour cost to the employer and the corresponding net take-home pay of the employee.

Tax wedge = 1-(1-TYH.R)*(1-SSC.R)*(PGDP/PCP)

= 1-(1-TYH/(WSSS-SSC+YOTH))*(1-SSC/WSSS)*(PGDP/PCP)

where:

TYH : Direct taxes on household income

WSSS : Compensation of employees

SSC : Social Security Contributions (excluding self-employed)

YOTH : Net self-employment and property income received by households

PGDP : GDP price deflator

PCP : Private consumption price deflator

Source: OECD, Economic Outlook No 87, May 2010 and Revenue Statistics, 2010.

PES and administration, employment incentives and training measures: Public expenditure in labour market programmes per unemployed person divided by GDP per capita adjusted for cyclical fluctuations using a HP filter.
Source: OECD, Employment Outlook 2010.

Employment protection for regular contracts: OECD summary indicator of the stringency of employment protection legislation for regular or temporary workers.
Source: Venn (2009).

Product market regulation (PMR): OECD summary indicator of regulatory impediments to product market competition in seven non-manufacturing industries.
Source: Wölfl, A., I. Wanner, T. Kozluk, G. Nicoletti (2009), "Ten Years of Product Market Reform in OECD Countries: Insights from a Revised PMR Indicator", OECD Economics Department Working Papers, No. 695, OECD Paris.

Union density: Trade union density rate, *i.e.* the share of workers affiliated to a trade union, in %
Source: OECD, Employment Outlook 2010

Minimum wage: Ratio of minimum wage to median wage.
Source: Employment Labour and Social Affairs Directorate Database and National sources.

Other variables
Output gap: OECD measure of the gap between actual and potential output as a percentage of potential output.
Source: OECD Economic Outlook No.87, May 2010.