

## Chapter 7

# Reassessing the Role of Policies and Institutions for Labour Market Performance: A Quantitative Analysis

*Did countries that undertook structural reforms fare better than the others in terms of employment and unemployment? How much of the evolution of employment and unemployment in the recent years can be explained by institutional and policy changes? Changes in policies and institutions appear to explain almost two-thirds of non-cyclical unemployment changes over the past two decades. Reforms in the tax-benefit systems and liberalisation of product market regulations unambiguously improve labour market performance. Reforms in these areas appear to be mutually reinforcing, so that the benefit from any particular policy reform tends to be greater the more employment-friendly the overall policy and institutional framework. Likewise, spending on active labour market programmes can reduce work disincentive effects brought about by generous unemployment benefits. Macroeconomic conditions also matter for unemployment performance, but their impact is shaped by labour market policies and institutions.*

## Introduction and main findings

There is a rich literature on the labour market effects of policies and institutions. While the main policy conclusions from these studies have generally been consistent with the main thrust of the 1994 OECD Jobs Strategy, some of the policy recommendations have been challenged (see, in particular, Chapter 3). The purpose of this chapter is to report on new OECD empirical analysis of the policy drivers behind labour market performance, taking into account recent advances in both theory and empirical methodology. The chapter provides the key background empirical support for the evaluation and reformulation of policy recommendations made in the previous chapters as well as in OECD (2006b).<sup>1</sup>

More specifically, the chapter presents macroeconometric estimates of the impact of structural policies and institutions on employment and unemployment. To this end, heavy reliance is made on cross-country/time-series econometric techniques. Although the main focus of the paper is on labour market policies and institutions, issues that have emerged more recently in the literature are also covered, including the role of product market regulation, interactions among structural policies, and the effects of policies and institutions on economic resilience to macroeconomic shocks.

This chapter is divided into two sections. Section 1 looks at the determinants of structural unemployment in OECD countries by: i) analysing the direct impact of policies and institutions on unemployment and exploring the extent to which *interactions* across policies and institutions matter; ii) developing specific evaluations of the role of additional institutions, which for various reasons needed an ad-hoc econometric treatment;<sup>2</sup> and iii) examining how policies and institutions contribute to shape unemployment patterns not only directly but also indirectly via their interaction with macroeconomic shocks. Given that sound labour market performance ultimately hinges on high employment prospects for all, rather than on low unemployment *per se*, Section 2 focuses on policy and institutional drivers of employment rates. A specific analysis of employment rates of youth, women and older workers is presented.

The main findings are as follows:

- On average, changes in policies and institutions appear to explain almost two-thirds of non-cyclical unemployment changes over the past two decades. A consistent finding is that generous unemployment benefits, high tax wedges and stringent anti-competitive product market regulation increase aggregate unemployment. By contrast, highly centralised and/or coordinated wage bargaining systems reduce it. Likewise, spending on certain active labour market programmes, such as labour market training, is associated with lower unemployment. Extensive sensitivity analysis shows that these findings are robust across specifications, datasets and econometric methods.
- Policies and institutions affect employment not only via their impact on aggregate unemployment but also through their effects on labour market participation, particularly for those groups “at the margin” of the labour market. High unemployment

benefits and high tax wedges are found to be associated with lower employment prospects for all groups. There is also evidence that group-specific policy determinants matter, such as targeted fiscal incentives. Yet, some caution is necessary when interpreting these latter findings, insofar as the empirical analysis of employment rates is not always as robust as that of unemployment.

- The precise impact of a given policy reform appears to vary depending on the institutional context, tending to be greater the more employment-friendly the overall policy and institutional framework. This suggests that structural reforms are complementary. There are exceptions to this general pattern, however: the adverse impact of generous unemployment benefits on unemployment appears to be mitigated by high public spending on active labour market programmes.
- In line with a number of previous studies, no significant impact of employment protection legislation on aggregate unemployment is found. However, effects appear to vary across labour market groups. Stringent employment protection legislation seems to depress youth employment, while it may benefit older workers.
- Finally, while policies and institutions appear to play a major role in shaping employment patterns, macroeconomic conditions also matter. Lower productivity growth, deteriorations in the terms of trade and increases in long-term real interest rates are all found to increase aggregate unemployment. And the size of the impact of these shocks is shaped by existing policies and institutions.

## 1. The determinants of structural unemployment

Economic theory and previous empirical studies have identified a number of policy and institutional determinants of unemployment (see Chapters 3, 4 and 6 for comprehensive surveys of the literature). These include *inter alia* unemployment benefits, taxes, trade union bargaining power and the structure of collective bargaining, employment protection legislation (EPL), anti-competitive product market regulation (PMR), active labour market programmes (ALMPs), minimum wages and housing policies.

Overall, there is fairly robust evidence that the level and duration of unemployment benefits have a detrimental impact on unemployment (Scarpetta, 1996; Nickell, 1998; Elmeskov *et al.*, 1998; Nunziata, 2002). Likewise, a number of empirical studies have found that high labour taxes tend to increase unemployment rates (Belot and van Ours, 2004; Nickell, 1997), although other studies are less conclusive (Scarpetta, 1996; Nunziata, 2002; Di Tella and MacCulloch, 2005). A few macroeconomic studies also identify a favourable effect of spending on ALMPs and an adverse impact of home ownership on aggregate unemployment (*e.g.* Scarpetta, 1996; Nickell, 1997, 1998; Green and Hendershott, 2001; Boone and van Ours, 2004; Nickell *et al.*, 2005).

There is less consensus in the literature regarding the unemployment effects of EPL, trade union bargaining power and the structure of collective bargaining. And there is only scant macroeconomic evidence on the employment effects of product market regulation. Among the few studies on this issue, Nicoletti *et al.* (2001) and Nicoletti and Scarpetta (2005) both find that product market reforms improve labour market performance.

This section provides a new empirical assessment of the impact of these policies on unemployment. Compared with previous studies, it uses a comprehensive database and takes advantage of the most up-to-date macroeconomic techniques. Box 7.1 briefly presents the methodology.

### Box 7.1. The econometric model

Most of the econometric analysis reported in this section is based on a reduced-form static unemployment equation, which is consistent with a variety of theoretical models of labour market equilibrium, including standard job-search (Pissarides, 2000) and wage-setting/price-setting models (e.g. Layard *et al.*, 1991; Nickell and Layard, 1999). In the case of unemployment, the reduced form is:

$$U_{it} = \sum_j \beta_j X_{it}^j + \sum_l \phi_l Z_{it}^l + \alpha_i + \lambda_t + \varepsilon_{it}$$

where  $i$  and  $t$  are country and time suffices,  $U$  is the unemployment rate,  $X$  are OECD measures of the policies and institutions considered as explanatory variables,  $Z$  are other control variables capturing, notably, cyclical fluctuations,  $\alpha$  and  $\lambda$  are country and time fixed effects, and  $\varepsilon$  is the standard error term. The linear model presented above is, in several occasions, augmented by interactions among institutions or between institutions and shocks. In all estimated models, except in the sensitivity analysis, observations for Finland, Germany and Sweden in 1990 and 1991 are removed from the sample, and different country fixed effects are used for each of these three countries over the two sub-periods “before 1990” and “after 1991”. This reflects the view that observable institutions and macroeconomic shocks cannot fully capture highly country-specific factors – including *inter alia*, the collapse of the Soviet Union for Finland, the German re-unification and the Swedish banking crisis – which were behind the upward shift in unemployment over this two-year period in these three countries. Still, as shown in Bassanini and Duval (2006), the main conclusions from the analysis are not dependent on whether these observations are excluded or not from the sample.

Models of determinants of the employment rate used in this chapter are similar but more complex. Employment rates are estimated as a function of factors of labour force participation as well as determinants of unemployment. Moreover, insofar as the former typically vary across population groups, the analysis is undertaken simultaneously for prime-age men, prime-age women, older workers and youth, allowing group-specific error terms to be contemporaneously correlated.

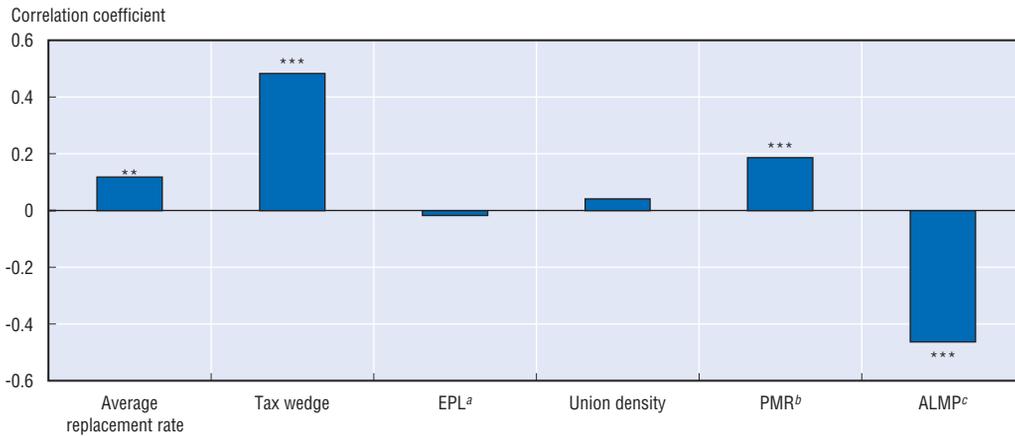
## 1.1. Policies, institutions and unemployment: baseline results

### *Several institutional variables appear to be correlated with the unemployment rate*

Figure 7.1 presents simple correlations<sup>3</sup> between unemployment and the main policies and institutions considered in this chapter, namely: a summary measure of unemployment benefit generosity (an average of replacement rates across various earnings levels, family situations and durations of unemployment); the tax-wedge between labour cost and take-home pay (for a single-earner couple with two children, at average earnings levels); the degree of stringency of EPL; the average degree of stringency of PMR across seven non-manufacturing industries; union membership rates; and an indicator of the “spending” effort on ALMPs (total expenditures per unemployed worker as a percentage of GDP per capita). Unemployment benefits, the tax wedge, PMR and ALMPs appear to be significantly correlated with unemployment, while correlations are not significant in the case of EPL and union density.<sup>4</sup>

Figure 7.1. **Correlations between the unemployment rate and selected institutions and policies**

Variables purged from both country and time fixed effects, 1982-2003



ALMP: Active labour market programmes. EPL: Employment protection legislation. PMR: Product market regulation. \*\*\*, \*\*, \*, statistically significant at 1%, 5% and 10% levels, respectively.

a) Index of stringency of the employment protection legislation.

b) Index of stringency of anti-competitive product market regulation.

c) Average ALMP expenditures per unemployed person as a percentage of GDP per capita.

Source: OECD estimates.

Statlink: <http://dx.doi.org/10.1787/837846658514>

### ***In the average OECD country, unemployment benefits negatively affect unemployment...***

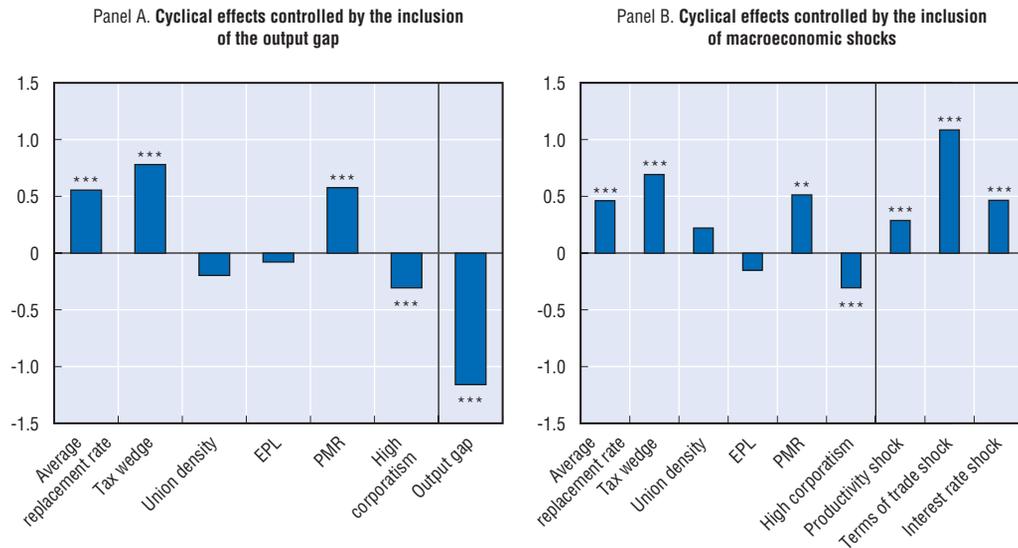
Multivariate analysis yields similar results (see Table 7.A1.1). First of all, average benefit replacement rates appear to significantly raise unemployment, for the average OECD country.<sup>5</sup> Moreover, the adverse impact of the summary measure of unemployment benefits, which is consistent with most of previous literature (see Chapter 3), reflects the combined effect of the replacement rate during the first year of unemployment, the duration of benefit receipt and the interaction between these variables (see Table 7.A1.1, Column 2).

### ***... as do labour and consumption taxes as well as weak product market competition***

The tax wedge is also robustly found to raise unemployment. Both labour taxes and consumption taxes – which are the two main alternative drivers of the tax wedge – have a strong and similar effect (see Table 7.A1.1, Column 5). Likewise, economies with limited product market competition tend to be associated with high unemployment – the price for their “quiet life”.<sup>6</sup>

What is the relative importance of each of these policies in determining unemployment? In order to answer this question, it is necessary to quantify each policy and to compare their impact on the basis of a common scale. The approach taken in this chapter is to consider “historically typical” reforms, corresponding to one standard deviation of each policy variable, where deviations have been netted out of cross-sectional variation.<sup>7</sup> On this basis, it can be concluded that a “historically typical” reform of the average benefits replacement rate (that is 4.7 percentage points), the tax wedge (2.8 percentage points) and PMR (1 unit) would result in a fall of the unemployment rate of about 0.5, 0.7 and 0.5 percentage point, respectively, for the average OECD country (Figure 7.2).

**Figure 7.2. Unemployment benefits, tax wedges, product market competition and the structure of collective bargaining significantly affect unemployment**  
 Percentage-point impact of one standard deviation increases in policies or macroeconomic shocks,<sup>a</sup>  
 baseline model, 1982-2003



EPL: Employment protection legislation. PMR: Product market regulation.

\*\*\*, \*\*, \*, statistically significant at 1%, 5% and 10% levels, respectively.

a) For each policy or adverse macroeconomic shock, the figure shows the estimated effect on the unemployment rate of a one standard deviation from the sample average for a country where all other variables are equal to the sample average. Standard deviations are computed using time-series variation only (that is, netting out cross-sectional variation). Magnitudes of policy and output gap increases as well as adverse macroeconomic shocks are set as follows: average replacement rate, 4.7 percentage points; tax wedge, 2.8 percentage points; union density, 6.0 percentage points; EPL, 0.3 unit of the synthetic indicator; PMR, 1.0 unit of the synthetic indicator; high corporatism, 1/5 of the value of the dummy variable; output gap, 2.4 percentage points; total factor productivity negative deviation from its trend, obtained through an Hodrick-Prescott filter, 2.2 percentage points; deterioration in the terms of trade, 5.6 percentage points; and increase in the long-run interest rate, 2.1 percentage points. In the case of policy variables, these changes can be considered to correspond to the size of “historically typical” policy reforms. For example, the figure shows that a “historically typical” reform of the unemployment insurance would reduce the unemployment rate by about 0.5 percentage point in the average OECD country.

Source: OECD estimates (see Table 7.A1.1, Columns 1 and 6).

Statlink: <http://dx.doi.org/10.1787/376346080628>

### The level of coordination of the wage-bargaining matter...

The degree of corporatism – captured by a dummy variable, which takes the value of one when wage bargaining is highly centralised or co-ordinated and zero otherwise<sup>8</sup> – is found to significantly reduce unemployment, lending some support to the view that, in centralised/co-ordinated bargaining systems, unions and employers are able to internalise the adverse employment consequences of excessive wage claims.

### ... but the effects of trade-unions and employment protection legislation are statistically insignificant

By contrast, the impact of EPL and union density on unemployment are statistically insignificant. These findings are not inconsistent with recent theoretical developments that predict that: i) lay-off regulations tend to affect more the distribution of unemployment rather than its level; and ii) the bargaining power of unions has more to do with the way rents are distributed rather than the level of labour demand (see Chapter 3). Yet, the latter result might reflect the fact that union density poorly captures the actual

bargaining power of workers. Indeed, in some countries, the coverage of collective agreements largely exceeds the number of trade union members – this reflects, *inter alia*, legal procedures and practices to extend collective contracts to unaffiliated workers, including those employed in non-signatory firms (see OECD, 2004a). The possible effects of such practices could not be assessed in this analysis.

### ***Macroeconomic shocks play an important role***

The estimated coefficient of the output gap is also highly significant (Figure 7.2, Panel A), suggesting that cyclical unemployment patterns can be explained by aggregate demand and supply developments – and not only by labour- and product-market policy settings. In order to shed further light on this issue, the baseline equation is re-estimated by substituting a number of observable macroeconomic variables, or “shocks”, for the output gap (Figure 7.2, Panel B). In line with recent empirical literature, three types of adverse “shocks” are considered for analysis: lower productivity growth; a deterioration in the terms of trade (resulting, for instance, from an oil price shock); and an increase in long-term real interest rates.<sup>9</sup> It is estimated that an adverse shock of “historically typical” size would increase the unemployment rate by about 0.3, 1.1 and 0.5 percentage points, respectively. These findings confirm that macroeconomic shocks can well explain fluctuations of unemployment over the business cycle, as well as the evolution of structural unemployment if they persist over time (such as in the case of a permanent deterioration of the terms of trade or a permanent increase of the interest rate; see Blanchard and Katz, 1999; Blanchard, 1998, 2000; Nickell *et al.*, 2005).

### ***The evolution of unemployment in the past two decades is well explained by policy reforms***

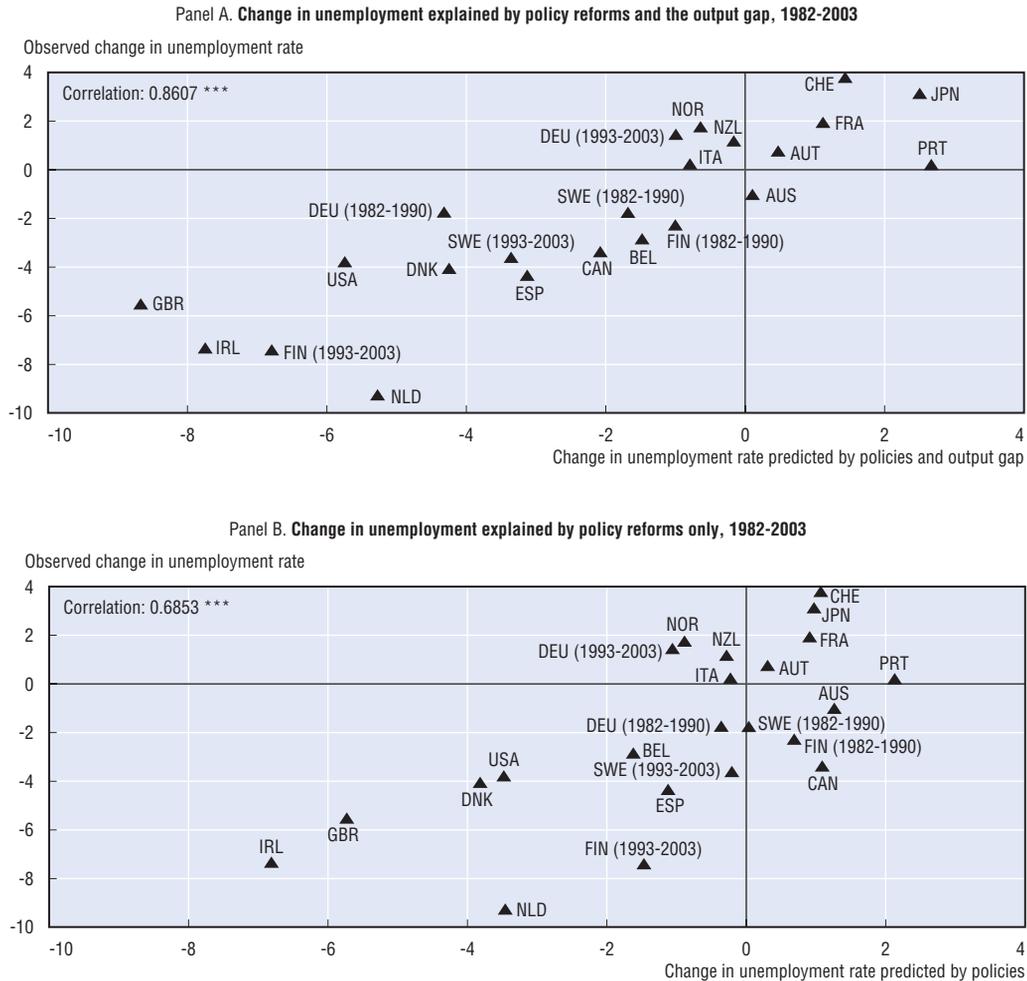
Overall, empirical results based on the baseline regression model show that policies and output gap explain a significant share of past unemployment trends for most countries (Figure 7.3, Panel A). This is true even when considering the impact of policies and institutions alone, *i.e.* excluding the effects of the output gap (Figure 7.3, Panel B).<sup>10</sup> Changes in policies and institutions are estimated to explain 47% of the cross-country variance of observed unemployment changes between 1982 and 2003. This figure rises to 74% when changes in the output gap are also taken into account.<sup>11</sup>

As shown in Figure 7.3, many of the countries that succeeded in lowering unemployment undertook important reforms in their product markets and tax-benefit systems (*e.g.* Denmark, Ireland and the United Kingdom). Policy changes were less employment-friendly in those countries where unemployment stagnated or rose (*e.g.* France, Japan and Switzerland). For certain countries (*e.g.* Canada, Finland, Spain and Sweden), the variation in labour market performance between 1982 and 2003 is essentially explained by the output gap.<sup>12</sup> Finally, there are some countries for which past unemployment trends are harder to explain on the basis of this simple regression model. In particular, the gradual pick up in unemployment in Germany after the re-unification is not properly explained by either policy or control variables included in the analysis. And the drop in unemployment in the Netherlands since the early 1980s has been larger than predicted by the model.

### ***Policies appear to interact with the overall institutional framework***

It has been argued that comprehensive reform packages are likely to be more effective in reducing unemployment than “piece-meal” labour market reforms (Belot and van Ours, 2004; Coe and Snower, 1997; Elmeskov *et al.*, 1998; Fitoussi *et al.*, 1998; Orszag and Snower, 1998).

Figure 7.3. **The evolution of unemployment is well explained by policy reforms**



Source: OECD estimates (see Table 7.A1.1, Column 1).

Statlink: <http://dx.doi.org/10.1787/712832215813>

This would arise, in particular, in the presence of reform complementarity or, more generally, when policy changes interact with each other. Recent descriptive analysis, however, does not provide straightforward evidence in favour of comprehensive reform packages. While successful reformers like Denmark and the Netherlands have applied comprehensive reform programmes, other successful countries like Ireland and the United Kingdom have adopted reforms more narrowly targeted on specific fields (Brandt *et al.*, 2005).

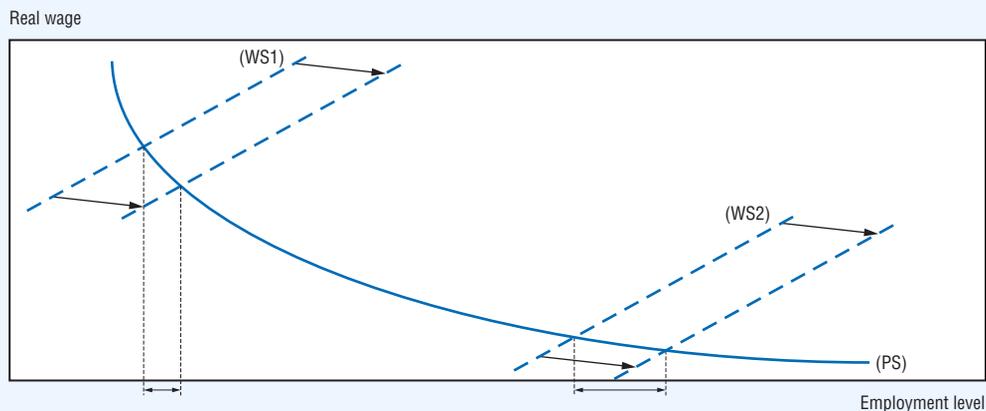
To shed further light on this issue, the baseline model is extended in various ways to allow for interactions among policies and institutions (the way theory has treated policy interactions in the context of unemployment analysis is briefly discussed in Box 7.2). Two results emerge from this analysis. First, no firm conclusions can be drawn regarding the presence of specific interactions between the policies and institutions included in the baseline specification. More precisely: i) certain interactions – *e.g.* between the tax wedge (or EPL) and wage bargaining regimes – appear to reflect particular country experiences and cannot be generalised; and ii) apparently strong interactions become statistically

### Box 7.2. Interactions among policies and institutions in the standard wage-setting/price-setting model

In a standard wage-setting/price-setting model (e.g. Layard et al., 1991; Nickell and Layard, 1999), it can be shown that institutions interact with each other in their impact on aggregate employment and unemployment. Such interactions reflect two groups of mechanisms, namely specific and systemic policy interactions (Belot and van Ours, 2004):

- First, policies and institutions that affect the *elasticity* of wage claims to employment (e.g. unemployment benefits, union bargaining power, product market regulation) and/or the elasticity of labour demand to the bargained wage (e.g. product market regulation, EPL, the tax wedge) interact with policies and institutions that shift the *level* of wage claims (e.g. unemployment benefits) and/or labour demand (e.g. product market regulation). More formally, any factor that affects the slope of the wage-setting (WS) and/or price-setting (PS) curves interacts with any factor that affects the level (i.e. the vertical position) of these curves. This implies that virtually any set of policies and institutions can affect employment outcomes in an interactive manner.
- Second, the marginal impact on labour demand of a given change in real wages is likely to be larger when employment is already high than when it is low. More formally, the labour demand or PS curve is likely to be convex in the real wage/employment space. As a result, labour market reform that shifts the WS curve downwards (e.g. a cut in unemployment benefits) will be greater the higher the initial level of employment, i.e. the more employment-friendly the initial institutional framework (see Figure below). This observation has led a number of researchers to argue that structural reforms are complementary, in the sense that the combined effect of several employment-friendly reforms is greater than the sum of the effects of each of them undertaken in isolation (Coe and Snower, 1997; Fitoussi et al., 1998; Orszag and Snower, 1998).

#### The higher the initial employment level, the greater the impact of a labour market reform



insignificant or even change sign when possible correlations between institutions and other omitted interactions are controlled for through instrumental variable techniques.<sup>13</sup> These results must, however, be seen as inconclusive insofar as they might reflect the lack of efficiency of the estimation method.

Second, there is evidence of the presence of “systemic” interactions – which arise when any reform that increases employment is complementary with the other employment-enhancing reforms taken as a whole (see Box 7.2, second bullet). In fact, additional econometric estimates, undertaken under more restrictive theoretical assumptions,<sup>14</sup> suggest that reforms of the tax wedge, unemployment benefits, PMR and union density are all complementary with one another. Consider, for example, reforms in these areas that would each reduce unemployment by 1 percentage point if implemented separately. All possible combinations of two such reforms, while keeping an unchanged policy stance as regards to the other two, are estimated to yield a total reduction of unemployment between 2.25 and 2.37 percentage points for the “average” OECD country. In other words, policy complementarities are estimated to amplify the unemployment effects of separate reforms by only 12% to 19%. Yet, if reforms in all four areas were undertaken simultaneously, the additional reduction in unemployment would surge to 46% of the impact of separate reforms.<sup>15</sup>

### **1.2. Additional determinants of unemployment patterns: minimum wages, active labour market programmes, and housing policy**

The analysis presented above follows the standard approach of excluding from the baseline specification those policies (such as minimum wage, active labour market programmes and housing policy) that require specific econometric treatments and are, therefore, usually not included in general macroeconomic studies of institutional determinants of unemployment.<sup>16</sup> This sub-section reports on econometric results obtained by case-by-case adaptation of the baseline model in order to encompass these additional institutional and policy variables.

#### ***Minimum wages have no clear impact on unemployment...***

To study the impact of minimum wages on unemployment, the baseline model is augmented by including the ratio of gross statutory minimum wages to median wages, following the most frequent approach in the literature (see *e.g.* OECD, 1998; Elmeskov *et al.*, 1998). Consistent with previous OECD work using this approach, no significant direct impact of the level of the minimum wage on unemployment is identified.<sup>17</sup>

#### ***... but appear to shape the effect of the tax wedge***

Additional estimates suggest, however, that a high tax wedge has more adverse effects on unemployment when the minimum wage is high. Indeed, the tax burden cannot be easily shifted onto wages when the minimum wage is binding, thereby magnifying the depressing effect of the tax wedge on the labour demand. The estimated impact of the minimum wage on the elasticity of unemployment to the tax wedge appears to be large: an increase in the ratio of minimum to median wages by 10 percentage points would increase the impact of the tax wedge on unemployment by about 50% in the “average” OECD country.

#### ***Only certain types of active labour market programmes are found to exert a direct impact on unemployment...***

Aggregate ALMP expenditures per unemployed person (expressed as a percentage of GDP per capita to ensure cross-country comparability) do not appear to have a significant direct impact on unemployment, when the baseline model is augmented by this indicator and

estimates are obtained by instrumental variable techniques.<sup>18</sup> When ALMP expenditures are disaggregated by category (that is, public employment services and administration; training programmes; youth measures; subsidized employment; and measures for the disabled), only training programmes appear to have a significant impact on unemployment.<sup>19</sup>

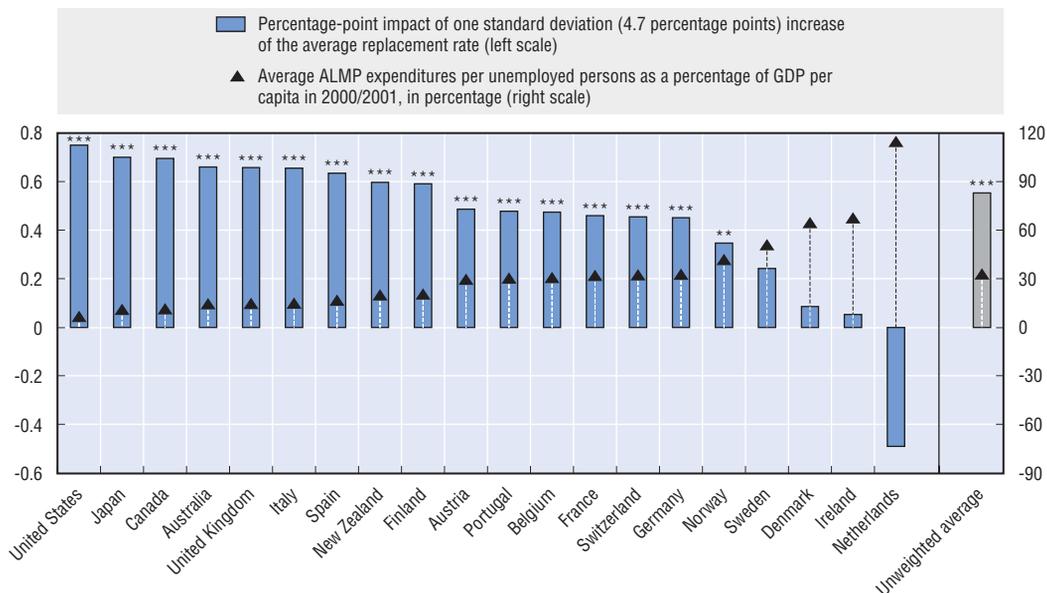
These findings seem in contrast with a number of micro-evaluation studies on the impact of ALMPs (see Chapter 3). One possible explanation is that most of these studies may fail to capture general equilibrium and long-run effects (see also OECD, 2005a). As a result, they tend to be overly optimistic as regards programmes involving large potential substitution effects (*e.g.* subsidised employment) as well as overly pessimistic on programmes that are likely to pay off only in the long-run (*e.g.* training programmes).

### ... but activation policies in general offset the disincentive effects of benefits

In the previous chapters it has been observed that careful integration of active and passive measures, combined with close monitoring of job search, can be effective in dampening disincentives effects brought about by generous unemployment benefits. This is confirmed by empirical analysis, which shows that the adverse impact of unemployment benefits is lower in countries that spend more on ALMPs. A rise in spending on ALMPs of the size corresponding to the “historically typical” reform,<sup>20</sup> reduces the adverse impact of unemployment benefits by about 20%. In fact, in countries with a strong emphasis on activation policies, like Denmark and the Netherlands, unemployment benefits have a statistically insignificant effect on unemployment (Figure 7.4).<sup>21</sup>

Figure 7.4. **Active labour market programmes can significantly modify the impact of unemployment benefits on the unemployment rate**

Impact of active labour market programmes (ALMPs) on the estimated effect of benefits on the unemployment rate, by country<sup>a</sup>



\*\*\*, \*\*, \*, statistically significant at 1%, 5% and 10% levels, respectively.

a) The figure shows the estimated effect of an increase in the average benefit replacement rate of 4.7 percentage points, for different levels of ALMP spending per unemployed as a share of GDP per capita (corresponding to spending levels in different OECD countries in 2000-2001), in a country with the OECD average level of all other policies and institutions. Standard deviations are computed using only time-series variation between 1982 and 2003 (that is, netting out cross-sectional variation).

Source: OECD estimates.

Statlink: <http://dx.doi.org/10.1787/182228723764>

### ***Home ownership is correlated with unemployment***

There is growing interest in the possible links between housing policy, job mobility and unemployment. However, empirical analysis of this issue is difficult due to data limitations. Cross-country comparable data on transaction costs and housing policies are scattered, while home ownership data are available only for period-averages, therefore these variables cannot be included in the econometric specification in a simple way. Yet, it is possible to shed light on the relationship between home-ownership and unemployment by looking at its correlation with estimated country fixed effects obtained from the baseline model. This correlation turns out to be high and significant (0.62): more than one-third of the variance among fixed effects appears to be explained by the average rate of home ownership during the 1990s. This finding, though in line with most existing macroeconomic studies (e.g. Oswald, 1997; Cameron and Muellbauer, 1998; Green and Hendershott, 2001; Nickell et al., 2005), must be interpreted with caution. Home-ownership might be endogenous insofar as societies with lower degrees of internal and external migration are likely to have higher rates of home-ownership and lower unemployment, with no causal link between them.

### **1.3. Interactions between institutions and shocks**

#### ***Institutions and policies can amplify or reduce the initial impact of macroeconomic shocks...***

As discussed in Chapter 6, institutions and policies can affect labour market performance not only directly but also indirectly, by shaping the size and persistence of macroeconomic shocks. In order to shed light on the quantitative importance of these effects, a dynamic version of the baseline model discussed in Box 7.1 has been estimated, allowing for interactions between shocks and institutions as regards both the initial unemployment impact of shocks and their persistence over time (see Box 7.3).

The main findings of this analysis are summarised in Figure 7.5. This shows that a “historically typical” cut of the average benefit replacement rate (4.7 percentage points) would dampen the unemployment effect of a shock by almost 10% in the average OECD country. Conversely, the tax wedge, high corporatism, ALMPs, EPL and PMR are all found to decrease the initial impact of shocks.<sup>22</sup> These effects appear to be consistent with the role of automatic stabiliser of the tax wedge, the wage-moderating impact of coordinated bargaining systems, the favourable impact of ALMPs on labour market frictions and the fact that regulations tend to slow down the reallocation of resources within the economy, thus minimising job destruction in the short-run.

#### ***... as well as their persistence over time,...***

EPL and PMR, however, by reducing labour demand, tend to depress hiring in the long-run (see e.g. OECD, 2004a). Consistently, they appear to increase the persistence of shocks. Consider, for example, a country with a degree of stringency of PMR such that it could reach the OECD average level by making a product market reform of “historically typical” size (that is, one unit of the indicator). By implementing the reform, this country will reduce the half-life of an adverse shock – that is the time required to reduce the initial unemployment impact of a shock by 50% – from about eight to about six years.<sup>23</sup>

### Box 7.3. Disentangling amplification and persistence effects of macroeconomic shocks

An adverse shock might not only raise current unemployment but, in addition, its effects might persist over time. In order to assess initial versus persistence effects of shocks, a dynamic version of the baseline model described in Box 7.1 is needed. The simplest dynamic version is the following:

$$\Delta U_{it} = -\phi U_{it-1} + \sum_l \phi_l Z_{it}^l + \text{Other covariates} + \varepsilon_{it},$$

where, as before,  $i$  and  $t$  are country and time suffices,  $U$  is the rate of unemployment,  $Z$  are (by and large transitory) macroeconomic shocks, and  $\varepsilon$  is the standard error term. Other covariates include determinants of structural unemployment, possibly including institutions and country effects.  $\phi$  is a non-negative coefficient that captures persistence mechanisms (the greater it is, the smaller the persistence),  $\phi$  are coefficients that capture amplification mechanisms (the greater they are, the larger the initial unemployment impact of a transitory shock). Importantly, *institutions and policies are assumed to affect both types of coefficients.*

From a quantitative point of view, while the interpretation of  $\phi$  is trivial (a 10% larger value of  $\phi$  implies a 10% greater initial impact of a shock on unemployment), that of  $\phi$  is somewhat more complex. The equation above is justified by a model in which, after a one-period transitory shock, unemployment goes back to its original long-run equilibrium level following an exponential time path:

$$U_{it} - U_{i0} = -(1 - e^{-\lambda t})(U_{i0} - U^*),$$

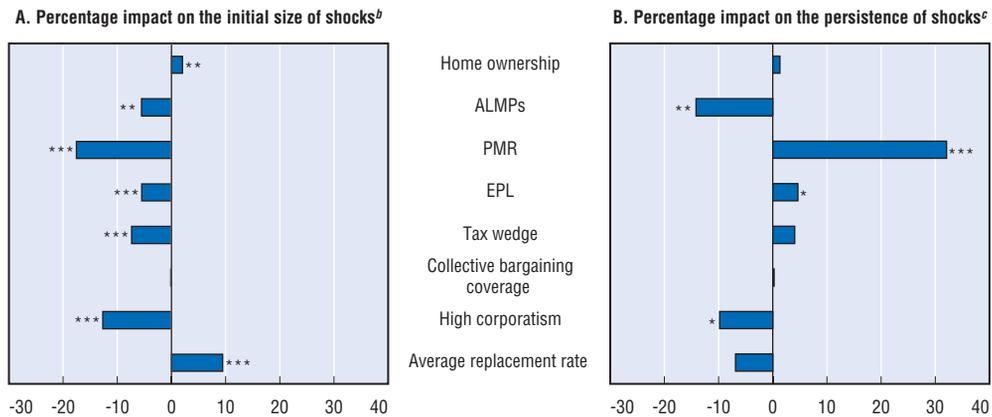
where  $U^*$  is the long-run equilibrium unemployment rate,  $\lambda$  is a parameter describing the speed of convergence to equilibrium unemployment and  $U_{i0} - U^*$  is the initial unemployment impact of a macroeconomic shock occurring at time 0. Since the empirical model above is estimated on annual data, it follows that  $\lambda = -\ln(1 - \phi)$ . Persistence is typically measured in terms of half-life of a shock – that is the time required to reduce the initial unemployment impact of a shock by 50% – which is therefore equal to  $\ln(2)/\lambda$ . Finally, if no discounting is assumed – i.e. in the absence of social preference for the current generation – the total cumulated impact, denoted  $I$ , of a shock on unemployment can be computed as:

$$I = \int_0^{+\infty} (U_{i0} - U^*) e^{-\lambda t} dt = \frac{U_{i0} - U^*}{\lambda}.$$

#### ... affecting the unemployment cost of adverse shocks for a long period

What do these counteracting effects imply for the average unemployment rate in the aftermath of a shock? Subject to reasonable assumptions (see Box 7.3), it is possible to derive from the econometric estimates the effect of each policy and institution on the total cumulated impact of an adverse shock on the unemployment rate. For the average OECD country, the cumulated impact of an adverse shock, whose initial effect is to increase the unemployment rate by 1 percentage point, ranges between 8.4 and 9.6 percentage points, depending on the empirical specification. In countries that are above the OECD average in terms of unemployment benefits or PMR – but that could reach the average by undertaking a reform of “historically typical” size – the average unemployment cost of an adverse shock will be almost 10% greater if they do not undergo the reform.<sup>24</sup> By contrast, high level

Figure 7.5. **The unemployment effects of macroeconomic shocks are shaped by existing policies and institutions<sup>a</sup>**



ALMPs: Active labour market programmes. EPL: Employment protection legislation. PMR: Product market regulation. \*\*\*, \*\*, \*, statistically significant at 1%, 5% and 10% levels, respectively.

- a) For each policy, the figure reports the estimated percentage effect of a one standard positive deviation from the sample average on the unemployment impact of an adverse macroeconomic shock for a country where all other variables are equal to the sample average. Standard deviations are computed using time-series variation only (that is, netting out cross-sectional variation). Magnitudes of policy increases are set as follows: average replacement rate, 4.7 percentage points; tax wedge, 2.8 percentage points; EPL, 0.3 unit of the synthetic indicator; PMR, 1.0 unit of the synthetic indicator; high corporatism, 1/5 of the value of the dummy variable; collective bargaining coverage, 0.5 percentage point; ALMP spending per unemployed as a share of GDP per capita, 10.8 percentage points; home-ownership (owner-occupied housing as a percentage of total occupied housing stock), 1.2 percentage points. These changes can be considered to correspond to the size of “historically typical” policy reforms. Estimates refer to the 1970-2003 period.
- b) The interpretation of Panel A is as follows: in a country where all policies and institutions are set equal to the sample average except, say, PMR, which is greater by one unit, the initial impact of shocks is smaller by 18% than in the average country.
- c) Persistence is measured as half-life, that is the time required to reduce the initial impact of a shock by 50%. For the average country this is between 5.8 and 6.6 years, depending on the specification. The interpretation of Panel B is as follows: in a country where all policies and institutions are set equal to the sample average except, say, PMR, which is greater by one unit, half-life of shocks is longer by 32% than in the average country.

Source: OECD estimates.

Statlink: <http://dx.doi.org/10.1787/824473075441>

of spending on ALMPs and centralised wage-bargaining tend to reduce average unemployment also by dampening the average effects of shocks in the long-run. Finally, reforms of tax wedges might have the drawback of amplifying the adverse impact of shocks to the extent that large tax cuts imply giving up a mechanism of macroeconomic stabilisation.

## 2. Group-specific employment rates

Good labour market performance depends not only on low rates of unemployment but also on high levels of employment. Previous chapters explain in more detail the key role of focusing on greater employment rates, and not just lower unemployment, especially in the context of population ageing. To some extent, labour market participation patterns reflect socio-cultural factors affecting the trade-off between work and alternative activities – including *inter alia* leisure, education or child rearing. However, current policy settings might result in sub-optimal participation rates, in particular for certain groups that are often “at the margin” of the labour market such as youth, women and older workers. Another related issue, which is not addressed here, is the impact of policy distortions on hours worked.

Table 7.1. **Institutions and policies change the cumulated unemployment cost of adverse macroeconomic shocks**Percentage impact<sup>a, b</sup>

Average replacement rate	9.45 [2.81]***
High corporatism	-21.23 [3.27]***
Collective bargaining coverage	0.13 [0.28]
Tax wedge	-7.35 [2.60]***
EPL	-1.10 [0.39]
PMR	8.90 [0.72]
ALMPs	-18.94 [2.89]***
Home ownership	2.01 [2.20]**

\*\*\*, \*\*, \*, statistically significant at 1%, 5%, 10% levels, respectively; t-statistics in brackets.

ALMPs: Active labour market programmes. EPL: Employment protection legislation. PMR: Product market regulation.

a) For each policy, the table reports the estimated percentage effect of a one standard positive deviation from the sample average on the cumulated unemployment impact of an adverse macroeconomic shock for a country where all other variables are equal to the sample average. Standard deviations are computed using time-series variation only (that is, netting out cross-sectional variation). Magnitudes of policy increases are set as follows: average replacement rate, 4.7 percentage points; tax wedge, 2.8 percentage points; EPL, 0.3 unit of the synthetic indicator; PMR, 1.0 unit of the synthetic indicator; high corporatism, 1/5 of the value of the dummy variable; collective bargaining coverage, 0.5 percentage point; ALMP spending per unemployed as a share of GDP per capita, 10.8 percentage points; home-ownership (owner-occupied housing as a percentage of total occupied housing stock), 1.2 percentage points. Estimates refer to the 1970-2003 period.

b) Cumulated impacts of shocks are computed under the assumption of zero social discount rate. For the average country, the cumulated impact on the unemployment rate of a shock, whose initial impact on the unemployment rate is 1 percentage point, is between 8.4 and 9.6 percentage points, depending on the specification. The interpretation of the estimates is as follows: in a country where all policies and institutions are set equal to the sample average except, say, average benefit replacement rates, which is greater by 4.7 percentage points, the cumulated increase in unemployment induced by an adverse shock until it is thoroughly reabsorbed is 9.45% greater than in the average country.

Source: OECD estimates.

Statlink: <http://dx.doi.org/10.1787/446406664705>

This section explores the policy and institutional determinants of employment rates. The empirical analysis proceeds by estimating pooled cross-country/time-series regressions, all of which incorporate within the same framework two types of variables: i) the determinants of unemployment studied in the baseline regression of the previous section, namely average unemployment benefit replacement rates, tax wedges, union density, EPL, PMR and coordinated wage-bargaining; and, ii) factors behind labour market participation decisions. Since the latter factors tend to vary across population groups, the analysis is undertaken separately for prime-age men and women, older workers and youth (see Box 7.1).

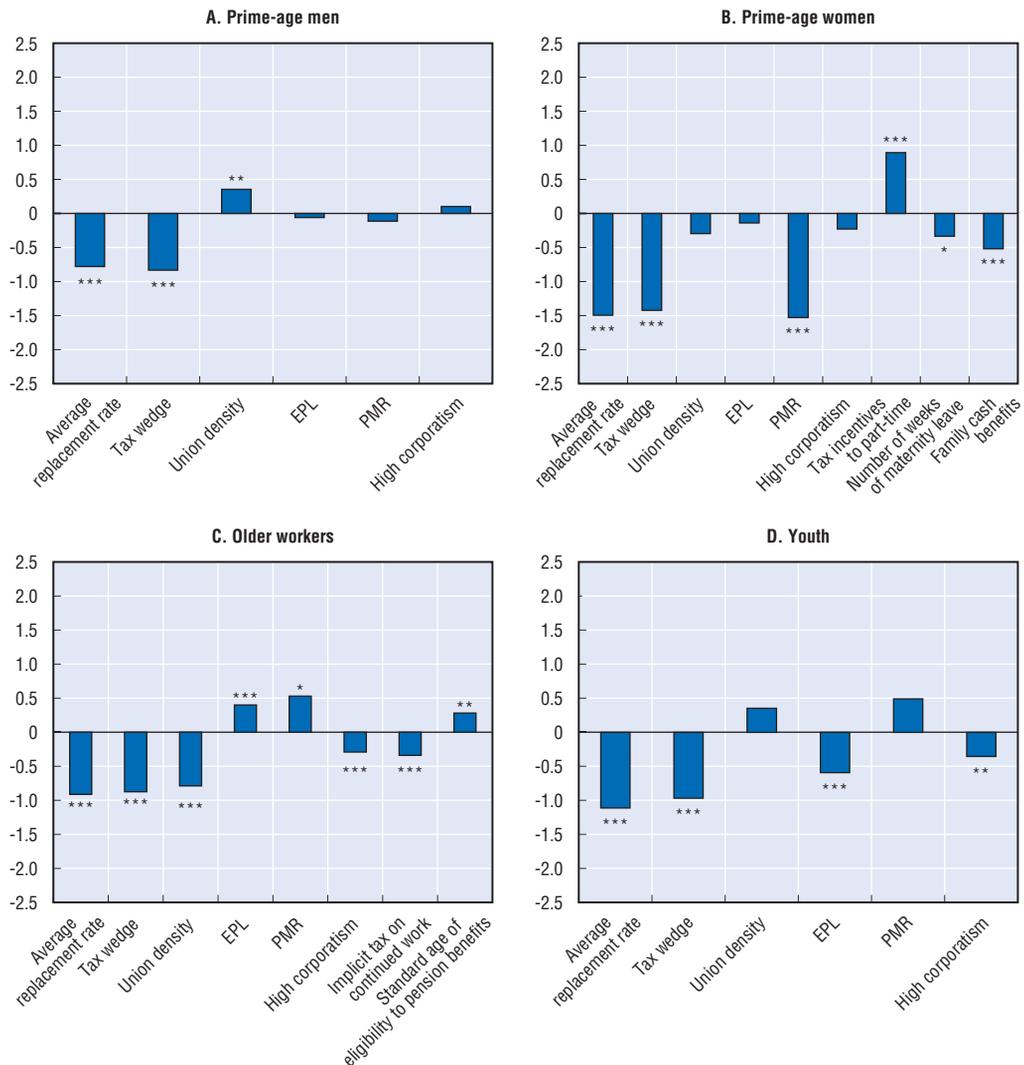
## 2.1. Prime-age men and women

### *High unemployment benefits and high tax wedges tend to reduce employment of both prime-age men and women...*

Figure 7.6 shows that overly generous unemployment benefits and heavy tax wedges exert considerable downward pressure on employment rates of both prime-age men and women. In the average OECD country, “historically typical” cuts in either unemployment benefits or the tax wedge – by 4.7 percentage points for the average benefit replacement

Figure 7.6. **The impact of policies and institutions on employment rates vary across demographic groups**

Percentage-point impact of one standard deviation increases in policies,<sup>a</sup> baseline model, 1982-2003



EPL: Employment protection legislation. PMR: Product market regulation.

\*\*\*, \*\*, \*, statistically significant at 1%, 5% and 10% levels, respectively.

a) For each policy, the figure presents the estimated effect of a one standard deviation from the sample average for a country where all other variables are equal to the sample average. Standard deviations are computed using time-series variation only (that is, netting out cross-sectional variation). Magnitudes of policy and output gap increases are set as follows: average replacement rate, 4.7 percentage points; tax wedge, 2.8 percentage points; union density, 6.0 percentage points; EPL, 0.3 unit of the synthetic indicator; PMR, 1.0 unit of the synthetic indicator; high corporatism, 1/5 of the value of the dummy variable; output gap, 2.4 percentage points; incentives tax to part-time, 1.2 percentage point; number of weeks of maternity leaves, 18 weeks; family cash benefits, 2.2 percentage points; implicit tax on continued work, 3.3 percentage points; standard age of eligibility to pension benefits, 1/2 year. These changes can be considered to correspond to the size of “historically typical” policy reforms.

Source: OECD estimates (see Table 7.A1.2).

Statlink: <http://dx.doi.org/10.1787/000140633087>

rate and 2.8 percentage points for the tax wedge – are estimated to increase the employment rate of prime-age men of about 0.8 percentage point. The estimated rise in the employment rate of prime-age women is even larger (1.4 percentage points).

**... while product market regulations appear to have no effect on men's employment and a negative one on women's employment...**

By contrast, stringent PMR does not appear to affect prime-age men's employment while it has a negative effect on women's employment, of a size comparable to that of unemployment benefits and the tax wedge. The latter finding might reflect several factors. First, excessive regulation tends to restrict supply of services such as childcare and household services and drive up their prices, thus making it more difficult for parents to participate in the labour market. Second, restricted opening hours of shops might make it difficult for parents to reconcile work and family life. Third, and more important, by hindering the development of the service sector, excessive regulations of the service market may limit the creation of employment opportunities for women, who tend to be predominantly employed in the service sector.

**... and female employment is sensitive to tax-benefit incentives**

Another element that emerges from Figure 7.6 is that tax incentives to work part-time – defined here as the gain (loss if negative) in household disposable income from sharing market work between partners<sup>25</sup> – can have an important role in mobilising labour market participation of women and, therefore, employment. However, the employment gains yielded by greater tax incentives to part-time are partially compounded by substitution between part-time and full-time female employment (see Table 7.A1.2, Column 2), so that the overall impact on total hours worked is likely to be small.<sup>26</sup>

Overall, these results are broadly in line with previous OECD work on female participation (Jaumotte, 2004). Yet, two caveats must be kept in mind while interpreting the results for prime-age women. First, empirical results appear to be somewhat sensitive to specifications and country coverage of the sample. Second, the spectacular rise in female employment recorded in several countries over the past two decades is essentially explained by education and fertility patterns, as well as by broader socio-cultural change, rather than by the evolution of structural policies. In the case of Australia, Canada and Spain, for example, between 1982 and 2003 the baseline model “predicts” 17.3, 17.5 and 21.8 percentage point increase, respectively, in prime-age female employment rates. These figures are not far from the employment growth actually observed in the data (18.6, 13.7 and 20.9 percentage points, respectively), but less than one-tenth of this change is explained by policy reforms alone in all three cases.

## **2.2. Older workers**

***In the average OECD country, overly high unemployment benefits and tax wedges depress employment of older workers...***

The estimates also point to significant negative effects, on average, of high unemployment benefits and high tax wedges on the employment rate of individuals aged 55 to 64 – so-called older workers (Figure 7.6, Panel C). The quantitative impacts of these variables do not appear to differ significantly from those discussed above for prime-age men. Union density is also found to reduce older workers' employment. This finding would be consistent with the view that strong unions may compress the wage structure and drive a wedge between the labour cost and productivity of the least productive workers, thereby pricing them out of the job market (see *e.g.* Bertola *et al.*, 2002b). In the case of older workers, the wage-productivity gap can be further enlarged by the presence of seniority-based pay scales.<sup>27</sup>

**... as do retirement incentives...**

Not surprisingly, and in line with previous OECD work on labour market participation of older workers (Duval, 2004; OECD, 2006c), there is evidence that pension reforms aiming at improving the return to work *vis-à-vis* retirement may boost employment of older workers significantly. High implicit taxes on continued work – defined as the loss (gain) in net pension wealth from continuing to work, where net pension wealth is defined as the present value of the future stream of pension payments to which a person is entitled over his or her remaining life-time minus the future stream of contributions – appear to deter older workers from remaining in the labour market. High statutory retirement ages have the opposite effect. A “historically typical” pension reform encompassing both a lower implicit tax on continued work and higher statutory retirement age would increase older workers employment rates by up to 0.6 percentage point. In reality, such reforms may produce even larger effects. Indeed, recent reforms have tended to be larger in scope than the “historically typical” one. Moreover, empirical estimates presented here do not take into account the effect of these reforms on labour market participation of individuals over age 65. On the other hand, as stressed in OECD (2006c), it is essential to complement pension reform with measures to avoid that other welfare benefits do not become alternative pathways for early labour market exit. More generally, changes in workplace practices – notably as regards mandatory retirement and “ageism” – are also needed (see Chapter 4).

**... but stringent labour and product market regulations seem to have the opposite effect**

Remarkably, stringent EPL and PMR appear to have a positive effect on older workers employment. The consequence is that a reduction in EPL or PMR as implied by “historically typical” reforms would reduce older worker employment rates by 0.4 and 0.5 percentage point, respectively, with larger uncertainty bounds in the case of the PMR reform. These findings cautiously suggest that the smaller lay-off risk for incumbent older workers brought about by greater EPL and/or PMR outweigh their negative impact on hiring rates. In fact, the cost of dismissing someone with long tenure is often high when EPL is stringent, so that employers have an additional incentive to retain these workers. By contrast, EPL and PMR might affect hiring of older workers only to some extent, since these workers are close to retirement age (OECD, 2004a).

**2.3. Younger workers*****Macroeconometric estimates of youth employment outcomes are likely to be fragile***

It is especially difficult to analyse the determinants of youth employment, for both conceptual and empirical reasons. Enrolment in education is one of the main reasons behind low youth participation in the labour market – and youth employment cannot be properly understood without taking into account factors that affect the number of years spent in education. To a significant extent, the historical downward trend in youth employment rates reflects the increase in the duration of initial education. On the empirical side, sufficiently long time series of the share of youth enrolled in full-time education are not available and several important drivers of youth education and labour force participation decisions cannot be studied due to lack of data, including returns on education, the effectiveness of the education system or other institutional and policy features that influence the choice of combining education with part-time work. To minimise these problems the current analysis focuses on employment rates of individuals aged from 20 to 24 years.

***There is no clear empirical effect of minimum wages on youth employment, while unemployment benefits and the tax wedge reduce it...***

In practice, it turns out that certain empirical results of the determinants of youth employment depend on the methodology used and country coverage of the analysis. In particular, the minimum wage (or youth sub-minimum wage) may have a negative to positive effect on youth employment, depending on the estimation method. Among the most robust results, generous unemployment benefits and high tax wedges appear to reduce youth employment rates in the average OECD country, with estimated impacts that are comparable in size to those found earlier for other population groups (Figure 7.6, Panel D). The former finding might appear surprising, as young workers' employment history is often too short to be entitled to full unemployment benefits. However, it is likely to reflect more indirect effects via higher aggregate unemployment, which in turn discourages youths from entering the labour market, than standard direct effects on employment via higher reservation wages and reduced job-search intensity.

***... as does overly strict employment protection legislation***

Stringent EPL is also found to significantly depress youth employment, although the estimated magnitude of its impact depends on the specification. This finding lends some support to the view that binding EPL essentially undermines the job prospects of "marginal" groups in the labour market, e.g. those groups that enter the labour force and lack labour market credentials.<sup>28</sup>

**2.4. Summing up policy influences on employment rates**

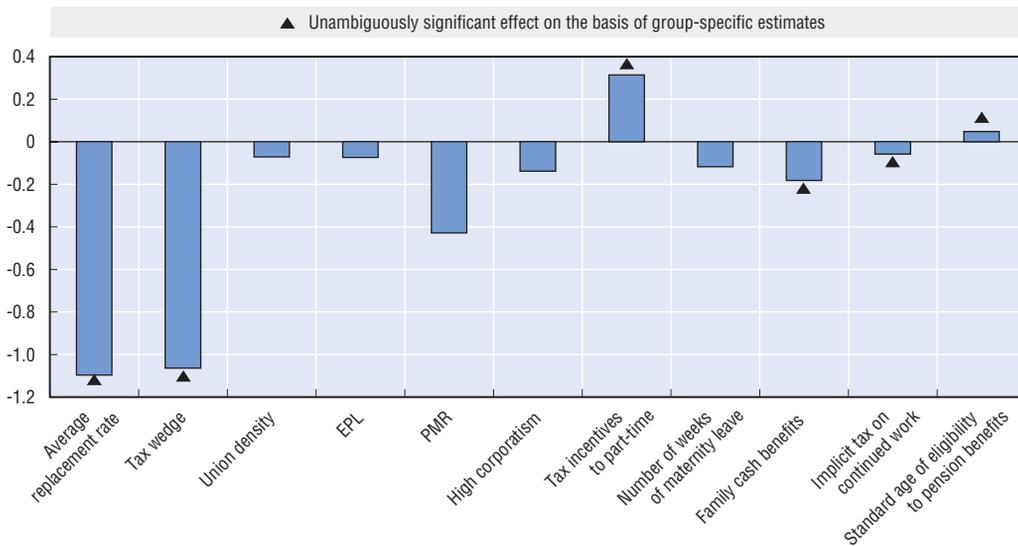
***In the average OECD country, tax wedge and unemployment benefits appear to be the most important determinants of aggregate employment rates ...***

Figure 7.7 summarises the main policy results of group-specific employment rate regressions. High unemployment benefits and high tax wedges tend to have a large and significant negative impact on the employment rates of all groups. *A fortiori*, this implies that these policies can significantly depress the aggregate employment rate. Using population-weighted averages of group-specific coefficients, baseline estimates imply that a "historically typical" reform reducing either the average gross replacement rate by 4.7 percentage points or the tax wedge by 2.8 percentage points would increase the employment rate by 1.1 percentage points in the average OECD country. This finding appears consistent with the results obtained in Section 1 as regards the determinants of aggregate unemployment. By contrast, other general policies and institutions – including PMR and high corporatism which have been found above to have significant influence on aggregate unemployment – appear to have contrasted effects on the employment rates of various groups. As a consequence, their aggregate impact cannot be unambiguously derived.

***... while group-specific policies appear to play a minor role***

Policies that affect only the employment rate of specific groups also presumably impact on the overall employment rate, even though general equilibrium analysis would ideally need to be undertaken in order to support this view. In particular, lower implicit taxes on continued work, higher statutory retirement ages, higher tax incentives to part-time work and family-friendly policies that increase the return to market work for

**Figure 7.7. Unemployment benefits, tax wedges and several group-specific policies have an unambiguous effect on the aggregate employment rate**  
 Derived percentage-point impact of one standard deviation increases in policies<sup>a</sup> on the employment rate of the working-age population, baseline model, 1982-2003



EPL: Employment protection legislation. PMR: Product market regulation.

a) For each policy, the figure presents the derived effect on the employment rate of a one standard deviation from the sample average for a country where all other variables are equal to the sample average. Aggregate effects are derived from group-specific estimates using population weights. Standard deviations are computed using time-series variation only (that is, netting out cross-sectional variation). Magnitudes of policy and output gap increases are set as follows: average replacement rate, 4.7 percentage points; tax wedge, 2.8 percentage points; union density, 6.0 percentage points; EPL, 0.3 unit of the synthetic indicator; PMR, 1.0 unit of the synthetic indicator; high corporatism, 1/5 of the value of the dummy variable; output gap, 2.4 percentage points; incentives tax to part-time, 1.2 percentage points; number of weeks of maternity leaves, 18 weeks; family cash benefits, 2.2 percentage points; implicit tax on continued work, 3.3 percentage points; standard age of eligibility to pension benefits, 1/2 year. These changes can be considered to correspond to the size of “historically typical” policy reforms.

Source: OECD estimates (see Figure 7.6).

Statlink: <http://dx.doi.org/10.1787/033656005682>

mothers – such as a substitution of public childcare subsidies for child benefits – all contribute to increase the overall employment rate.

The estimated impact of lower implicit taxes on continued work and higher statutory retirement ages on overall employment has been, however, moderate in the past two decades. This finding reflects three main factors: i) countries have been generally reluctant to undertake profound reform of retirement policies, so that the “historically typical” reform (one standard deviation in the time dimension) corresponds to a bare 3.3 percentage point change of the implicit tax; ii) despite population ageing, the share of the 55-64 age group in the working-age population remains small (17% on average between 1982 and 2003); and iii) the magnitude of estimated elasticities is small compared with other existing studies. The latter two factors imply that even a much greater reform such as, say, a 10 percentage point cut in the implicit tax is estimated to raise the aggregate employment rate by no more than 0.2 percentage point. However, these effects would grow dramatically if predicted rather than actual population shares were used and if the implications for the participation rate of the population aged 65 and over were taken into account.

## Notes

1. For more details on the analysis presented here, see Bassanini and Duval (2006). The reader is referred to that paper for sources, technical aspects (including methodological discussions) and sensitivity analyses that are not presented in detail here.
2. There are, however, a number of policies that are inevitably left out from the present analysis due to insufficient data, partially inherent to their purely qualitative nature (for example, lifelong learning policies, policies for the emergence of the informal economy, practices of management of public employment services). For deeper empirical evidence on these issues, see OECD (2003a, 2004a and 2005a).
3. Computed for a sample of 20 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States) using both cross-section and time-series information (at annual frequency) for the period 1982-2003. The same sample is used in regression exercises reported below.
4. Significance levels corresponds to t-statistics that are obtained by estimating the model in Box 7.1 including only one institution at a time plus country and time effects
5. Specification tests (see Bassanini and Duval, 2006) show that the estimates presented in Table 7.A1.1 are consistent and reasonably robust estimates of the average value of the coefficients. Yet, the fact that the average impact of policies and institutions is estimated in a consistent manner does not imply that they have the same effect for all countries. For this reason, estimates and simulations presented in this chapter should be regarded as referring to the average OECD country.
6. In a famous paper, the 1972 Nobel Prize in economics, John Hicks, stated that “The best of all monopoly profits is a quiet life” (Hicks, 1935, p. 8).
7. Estimates reported in Table 7.A1.1 are essentially obtained by exploiting only the information provided by the evolution of policies over time within each country. A standard (but cautious) statistical approach is, therefore, to limit simulations to reforms that are no greater than those observed within the sample – that is the past twenty years. The drawback of this approach is, obviously, that no account is made for the fact that certain reforms have been difficult to implement in many countries but they are not, by this fact, less important.
8. This variable is identified by the switch of certain countries from highly coordinated to decentralised systems and *vice versa*. As its time-series standard deviation is 0.2, this value is used in the simulations presented in Figure 7.2 to maintain comparability with other policies and institutions. To obtain the predicted unemployment gain from switching from low to high corporatism for a country where all other policies are at the OECD average, one must multiply by five the figure presented in Figure 7.2, obtaining 1.42 percentage points. Furthermore, the baseline specification includes a dummy for intermediate corporatism. However, being time-invariant within the sample, the effect of this variable is not identified (even if controlled for) and therefore is not reported in the tables and figures of this chapter.
9. Total factor productivity (TFP) shocks are defined here as the deviation of the logarithm of TFP from its trend calculated by means of a Hodrick-Prescott filter: in the presence of lagged wage adjustment to productivity growth, positive (negative) productivity surprises – as measured here by a positive (negative) gap between actual and trend TFP – should induce a temporary decline (increase) in structural unemployment (see e.g. Ball and Moffitt, 2002; Meyer, 2000). Terms of trade shocks are defined as the ratio of imports to output multiplied by the logarithm of their relative prices  $[(M/Y) \log (PM / PY)]$  i.e. in such a way that its growth rate is the change in the relative price of imports weighted by the share of imports in GDP: by widening the wedge between consumer and producer prices, a rise in the relative price of imports should increase wage pressure and, ultimately, unemployment (see e.g. Layard et al., 1991). Real interest rate shocks are defined as the difference between the ten-year nominal government bond yield and the annual GDP price inflation: a rise in real interest rates affects negatively capital accumulation and labour productivity, thereby reducing labour demand (at a given wage level) and increasing unemployment (see e.g. Blanchard, 1999, 2000). Certain specifications also include labour demand shocks, defined as the logarithm of the labour share in business-sector GDP purged from the short-run influence of factor prices, as in Blanchard (1998) and Blanchard and Wolfers (2000).
10. The difference between the two figures reflects the fact that certain countries were in different phases of the business cycle at the beginning and at the end of the period.

11. The key finding that tax wedges, average benefit replacement rates, product market regulation and high corporatism have significant unemployment effects appear also to be robust to several sensitivity exercises, concerning the choice of the estimation sample, model specifications, estimation techniques (including General Method of Moments estimation to better control for endogeneity of policy variables).
12. These countries were in different phases of the business cycle in 1982 and in 2003. As a consequence, their output gap does not have the same value at the beginning and at the end of the period under analysis (compare Panel A with Panel B).
13. Several specific policy interactions have been analysed in the literature, often with contrasting results (see *e.g.* Elmeskov *et al.*, 1998; IMF, 2003; Belot and van Ours, 2001; Nicoletti and Scarpetta, 2005). Yet, these studies do not always take into account the fact that all interactions are theoretically possible (see Box 7.2, first bullet) and should therefore be studied simultaneously, otherwise estimation results can be spurious.
14. Namely that i) policies and institutions have limited direct impact on the sensitivity of wage claims and labour demand to unemployment and real wages, respectively; and ii) the labour demand is convex, that is such that a greater fall in real wages is necessary to increase it when employment is low rather than when employment is high. To put it another way, these conditions imply that the effect discussed in the second bullet of Box 7.2 dominates any counteracting effect discussed in the first bullet. Although the consistency of the estimates crucially hinges upon the validity of these specific theoretical assumptions, systemic interactions turn out to be more robust than standard interactions, notably to controls for omitted interactions.
15. See also Table 6.4. The additional effect of the combination of the four reforms, over and above the sum of the effect of each reform taken in isolation, can be obtained by summing the values in all cells.
16. In particular, i) data on housing policy and home-ownership are scattered and available essentially in cross-section; ii) reliable minimum wage time series exist only for countries where minimum wages are statutory; and iii) measures of ALMP intensity are available only since 1985 and are likely to be endogenous to unemployment by construction.
17. Yet, statutory minima are available for ten countries and results are somewhat difficult to generalise to countries where minimum wages are set by collective bargaining.
18. ALMP expenditure per unemployed person is the standard indicator of countries' spending efforts in pursuing activation policies used in most macroeconomic studies. This indicator is expressed as a percentage of GDP per capita to ensure cross-country comparability (*e.g.* Scarpetta, 1996; Nickell, 1997, 1998; Nickell and Layard, 1999; Boone and van Ours, 2004). Since ALMP expenditures are unlikely to vary in proportion to changes in unemployment, such a synthetic indicator of ALMP spending is likely to be endogenous insofar as it tends to decline (rise) when unemployment goes up (down). Instrumental variable techniques become thus necessary. Several different instrumental variable approaches have been used, including: 2SLS using average ALMP spending per country as an instrument; 2SLS using suitable lags of cyclically adjusted ALMP spending as instruments; and system GMMs.
19. Bassanini and Duval (2006), Table 1.9.
20. Such a reform implies an increase in total expenditures per unemployed worker as a percentage of GDP per capita by 10 percentage points from the OECD average (27.9% in 2000).
21. More precisely, Figure 7.4 shows the impact that unemployment benefit would have in each country, taking into account the level of their spending in ALMPs, if other institutional and policy variables were set at the OECD average. For example, these estimates imply that a country where all other variables are set at the OECD average would have 0.3 percentage point lower unemployment if ALMP spending and unemployment insurance were set at the level of Denmark rather than the United States.
22. However, the separate impact of EPL and PMR is difficult to disentangle insofar as they are highly correlated and interact with shocks through similar channels. In fact, the effect of these variables becomes somewhat less significant when they are simultaneously included in the specification.
23. In other words, not undertaking that reform would imply maintaining the persistence of adverse shocks at a level that is 32% higher than in the average OECD country.
24. Yet, due to the inefficiency of the estimates of persistence effects, the impact of PMR is, albeit large, statistically insignificant.

25. The gain (loss) is calculated as the difference in household net income between a situation in which a single breadwinner earns 133% of the average production worker (APW) while his/her partner stays out of the labour force and a situation in which the main breadwinner earns 100% of APW and the second earner 33% of APW, possibly by taking up a part-time job. This difference is expressed as a percentage of household net income in the second situation.
26. Furthermore, parental leaves appear to be detrimental to part-time work, but they have a positive impact on full-time employment (the overall effect remains negative but is significant only at the 10% level and depends on the specification). Child benefits are also found to reduce aggregate female employment rates through their significant negative impact on part-time work. Finally (although not shown in the figure) in some specifications there is evidence that childcare expenditures have positive overall impact on female employment.
27. High corporatism is also found to have a negative and significant impact on older workers' employment. Yet, this result is entirely dependent on the presence of Italy in the sample.
28. However, if equations are specified in terms of unemployment rates rather than employment rates, EPL does not come out significant in all specifications. Additionally, Figure 7.7, Panel D, shows also a negative impact of high corporatism on youth employment, but this result depends on the specification and on the presence of Australia in the sample.

## ANNEX 7.A1

## Baseline Regression Models

Table 7.A1.1. **Baseline unemployment rate equations, 1982-2003**

	1	2	3	4	5	6	7
	Baseline	= 1 with ARR split into two components	= 1 with EPL split into two components	= 1 with tax wedge derived from national accounts	= 4 with separate labour and consumption tax rates	= 1 with standard macroeconomic shocks	= 6 with labour demand shock
Average replacement rate (ARR)	0.12 [6.28]***		0.12 [6.79]***	0.08 [4.22]***	0.09 [4.16]***	0.10 [4.14]***	0.09 [3.35]***
Tax wedge	0.28 [9.75]***	0.27 [10.96]***	0.27 [11.14]***	0.24 [4.49]***		0.24 [7.73]***	0.22 [6.40]***
Union density	-0.03 [1.57]	-0.03 [1.89]*	-0.03 [1.64]	-0.02 [0.56]	-0.01 [0.49]	0.04 [1.48]	0.06 [2.33]**
EPL	-0.31 [0.98]	-0.20 [0.55]		0.03 [0.08]	0.01 [0.02]	-0.61 [-1.52]	-0.51 [-1.22]
PMR	0.60 [2.98]***	0.67 [3.29]***	0.73 [3.52]***	0.50 [2.17]**	0.50 [2.17]**	0.54 [2.25]**	0.79 [3.28]***
High corporatism	-1.42 [3.57]***	-1.09 [2.88]***	-1.39 [3.94]***	-2.06 [4.80]***	-2.09 [4.89]***	-1.42 [-2.90]**	-1.58 [-3.26]***
Output gap	-0.48 [14.00]***	-0.48 [14.21]***	-0.47 [13.99]***	-0.54 [11.89]***	-0.54 [11.60]***		
RR 1st year		0.09 [7.37]***					
Benefit duration		2.64 [2.03]**					
(RR 1st)*(duration)		0.09 [2.69]***					
EPL regular			1.28 [2.49]**				
EPL temporary			-0.45 [2.16]**				
(EPL regular)*(EPL temporary)			-0.28 [1.21]				
Labour tax rate					0.25 [4.82]***		
Consumption tax rate					0.21 [1.92]*		
<b>Macroeconomic shocks</b>							
Productivity shock						-12.81 [-3.34]***	-8.87 [-2.33]**
Terms of trade shock						19.40 [6.45]***	19.09 [6.09]***
Interest rate shock						0.22 [2.72]***	0.19 [2.44]**
Labour demand shock							11.79 [3.91]***
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	434	434	434	398	398	419	397
R-squared	0.98	0.92	0.92	0.98	0.98	0.98	0.98

\*\*\*, \*\*, \* , statistically significant at 1%, 5% and 10% levels, respectively.

EPL: Employment protection legislation. PMR: Product market regulation. RR: Replacement rate.

OLS estimators. Absolute value of robust t-statistics in brackets.

Source: OECD estimates.

Statlink: <http://dx.doi.org/10.1787/638612210662>

Table 7.A1.2. **Baseline employment rate equations, 1982-2003**

	1	2			3	4
	Prime-age men	Prime-age women			Older workers (55-64)	Youth (20-24)
		Full-time	Part-time	Aggregate <sup>a</sup>		
<b>General policies and institutions</b>						
Average replacement rate	-0.17 [7.42]***	-0.14 [3.71]***	-0.17 [3.00]***	-0.32 ***	-0.19 [7.12]***	-0.24 [5.61]***
Tax wedge	-0.30 [8.34]***	-0.12 [2.34]**	-0.38 [4.45]***	-0.50 ***	-0.31 [6.74]***	-0.34 [5.86]***
Union density	0.06 [2.30]**	0.16 [3.47]***	-0.21 [3.00]***	-0.05	-0.13 [5.34]***	0.06 [1.39]
EPL	-0.23 [0.66]	-1.54 [3.06]***	0.99 [1.32]	-0.55	1.59 [2.62]***	-2.35 [2.97]***
PMR	-0.12 [0.47]	-0.75 [2.67]***	-0.86 [1.99]**	-1.60 ***	0.56 [1.74]*	0.51 [1.04]
High corporatism	0.48 [1.14]	-1.63 [2.06]**	0.57 [0.47]	-1.06	-1.35 [3.09]***	-1.66 [2.13]**
<b>Group-specific policies and institutions</b>						
Tax incentives to part-time		-0.58 [8.91]***	1.35 [11.34]***	0.76 ***		
Relative marginal tax rate on 2nd earner (transition 100/0-100/66)		0.38 [0.55]	-1.23 [0.98]	-0.85		
Family cash benefits		0.06 [1.47]	-0.30 [3.83]***	-0.24 ***		
Leave weeks		0.02 [2.60]***	-0.04 [2.83]***	-0.02 *		
Implicit tax on continued work					-0.10 [2.82]***	
Standard age of eligibility to pension benefits					0.57 [2.28]**	
<b>Control variables</b>						
Female education		2.90 [4.72]***	-0.63 [0.57]	2.27 **		
Youth education						-3.18 [3.77]***
Youth cohort size						-0.22 [3.44]***
Output gap	0.49 [11.60]***	0.17 [3.17]***	0.10 [1.25]	0.26 ***	0.20 [4.39]***	0.82 [10.72]***
Other controls <sup>b</sup>	No		Yes		No	No
Country dummies	Yes		Yes		Yes	Yes
Time dummies	Yes		Yes		Yes	Yes
Observations	404		277		279	367
R-squared	0.99	0.99	0.96		0.99	0.94

Seemingly Unrelated Regression Estimators (SURE) of models including, for each of them, the displayed equation(s) plus an equation for prime age men. Absolute value of t statistics in brackets. Equations for prime age men for models corresponding to Columns 2 to 4 are not shown.

\*\*\*, \*\*, \*, statistically significant at 1%, 5% and 10% levels, respectively.

- a) Derived impact of each explanatory variable on the aggregate prime age female employment rate. This impact is derived as the sum of each variable's effects on full time and part time employment rates. Its degree of significance is provided by a Fisher test of the null assumption that the sum of the coefficients on full time and part time employment rates is zero.
- b) Other controls include the proportion of married women, the number of children per woman as well as the interaction between the latter two variables.

Source: OECD estimates.

Statlink: <http://dx.doi.org/10.1787/001240286028>