

Chapter 6

Understanding Policy Interactions and Complementarities, and their Implication for Reform Strategies

Can different combinations of policies and institutions deliver similarly high employment rates? Since there are important interactions between macroeconomic, labour and product market policies, countries can take advantage of synergies and compensating mechanisms in assembling policy packages and building political support for reform. Nonetheless, only a few packages have been identified which can achieve high employment while also assuring fiscal sustainability and resilience in the face of adverse economic shocks. These successful policy packages combine stability-oriented macroeconomic policy and competitive products markets with a good overall incentive structure in the labour market. Two broad reform strategies for structuring labour market incentives can be identified in the OECD countries which have achieved high employment rates. These strategies differ in their implications for the level of public spending (and taxes) and the degree of risk and inequality characterising labour market – factors that play a key role vis-à-vis the political acceptability of structural reforms.

Since the formulation of the 1994 Jobs Strategy, there has been growing recognition that the effects of reforms in one area may depend on policy settings in other policy areas. Such policy interactions and complementarities do not call into doubt the intrinsic effect that each policy and institution discussed in Chapter 3 has on labour market performance, but suggest that it is appropriate to look at the constellation of policies in all areas in the designing of reforms in any one area. This chapter examines two types of interactions that are potentially important for labour market performance: i) the interaction between labour and product market policies and institutions on the one hand and the macroeconomic environment and policies on the other hand; and ii) the interaction between different labour and product market policies and institutions. The chapter concludes with a discussion of the political economy of labour market reform.

1. Labour market policies and institutions and the macroeconomic environment

The 1994 Jobs Strategy recognised the role of general macroeconomic conditions in partly shaping labour market performance and the importance of macroeconomic policy in reducing unemployment by providing a stable macroeconomic environment. The cross-country/time-series econometric estimates reported in Bassanini and Duval (2006) confirm this assessment. The analysis spans three decades, encompassing in particular the oil shocks and the productivity slowdown of the 1970s as well as the sharp increase in real interest rates which took place in the late 1970s and early 1980s. It is found that negative total factor productivity (TFP) shocks, deteriorations in the terms of trade, increases in long-term real interest rates and labour demand shocks negatively affect labour market performance.¹

In recent years, however, it has been advanced that macroeconomic shocks play a greater role in explaining long-term labour market performance than what the analysis of direct links would suggest. On the one hand, the interaction of adverse macroeconomic shocks and unfavourable structural policy settings may result in a persistent weakness in the labour market. On the other hand, labour market reforms may have significant beneficial effects on economic performance in general and on fiscal positions in particular, that may pave the way for further reforms and thus set in motion virtuous circles. These two issues are explored below.

1.1. The interaction between macroeconomic shocks and labour market policies and institutions

It has recently been argued that the current degree of heterogeneity in policies and institutions across OECD countries largely pre-dates – and is therefore unable to account for – the rise in the cross-country dispersion of unemployment rates which took place since the early 1970s (Blanchard and Wolfers, 2000). A complementary explanation stresses the role of interactions between existing institutions and the series of adverse macroeconomic shocks OECD countries went through during the past three decades, including, *inter alia*, oil price shocks, real interest rate shocks and the slowdown in the pace

of technological progress. Provided that these adverse shocks have been frequent and that certain policies and institutions have made their unemployment effects highly persistent, this could account *a priori* for the rise in unemployment observed in a number of – mainly European – OECD countries since the 1970s.

There are a number of channels through which cross-country differences in policy settings may lead to divergent employment outcomes in the face of common shocks. In particular, policies and institutions may amplify (mitigate) the initial unemployment impact of a shock, make it more (less) persistent, or both.

For instance, it has been argued that, by protecting labour market “insiders” from the risk of income loss, high unemployment benefits and/or strict employment protection legislation (EPL) can reduce the sensitivity of wages to general economic conditions, thereby preventing a swift adjustment of unemployment back to its initial level in the aftermath of a shock (see *e.g.* Blanchard, 1999). Moreover, theory suggests that strict product market regulation (PMR) can further increase unemployment persistence by making labour demand less sensitive to wages. By contrast, certain categories of active labour market programmes (ALMPs), such as job-search assistance, can increase the influence of labour market “outsiders” – including the long-term unemployed, youth and/or certain groups of female workers – in wage determination and thus reduce unemployment persistence. A high degree of centralisation and/or co-ordination of wage bargaining may also speed up wage adjustment to adverse shocks at the aggregate level. Likewise, housing market policies that facilitate labour mobility may dampen the unemployment impact of “reallocative” shocks – *i.e.* economic shocks that require a reallocation of resources across regions (for a recent overview of housing market policies and their economic effects in OECD countries, see Catte *et al.*, 2004).

Both *amplification* and *persistence* effects contribute to determine the degree of resilience of an economy’s labour market to adverse macroeconomic shocks. In this respect, those policies and institutions that amplify the initial impact of a shock may not necessarily increase its persistence, and *vice versa*. For instance, while strict labour- and product-market regulations tend to increase unemployment persistence, high firing costs may deter firms from laying off workers in the short run and stringent PMR creates rents that may be used to minimise lay-offs initially, thus reducing the initial impact of a shock.

Recent empirical evidence points to cross-country differences in the resilience of output and employment to shocks – most prominently between the United States and continental European countries (see *e.g.* Amisano and Serrati, 2003; Balakrishnan and Michelacci, 2001; Balmaseda *et al.*, 2000), and previous OECD work on resilience to economic shocks suggests that structural policy settings seem to matter in this respect (see in particular Drew *et al.*, 2004). These findings are consistent with the empirical literature indicating that interactions between institutions and shocks have contributed to shape unemployment patterns over the past decades (Blanchard and Wolfers, 2000).

Following this latter strand of literature, Bassanini and Duval (2006) use dynamic panel regression models to assess the role of interactions between macroeconomic shocks and institutions – understood to encompass the structural policy settings emphasised in the 1994 Jobs Strategy – for determining unemployment. The key result of the empirical analysis is that there is clear evidence that existing policies and institutions affect the size and persistence of the increase in unemployment following adverse shocks, even when the direct unemployment effects of policies and institutions on the one hand, and shocks on

Table 6.1. Interactions between policies/institutions and macroeconomic shocks

The unemployment effects of macroeconomic shocks...		... are shaped to a significant extent by policies and institutions		
Nature of the macroeconomic shocks	Impact on unemployment ^a	General policies and institutions	Initial impact of shocks ^a	Persistence of shocks ^a
Slowdown in the trend of total factor productivity	+	Replacement rate	+	n.s.
Deterioration in the terms of trade	+	Tax wedge	-	n.s.
Increase in long-term real interest rates	+	Union coverage	n.s.	n.s.
Adverse labour demand shock	+	EPL	-	+
		Product market regulation	-	+
		High corporatism	-	(-)
		ALMPs	(-)	-
		Home ownership	+	(+)

ALMP: Active labour market programmes. EPL: Employment protection legislation.

n.s.: Not statistically significant.

a) A positive (negative) impact denotes an increase (decline) in unemployment. (+) or (-) denotes positive or negative impact in some, but not all, empirical estimates.

Source: Bassanini and Duval (2006).

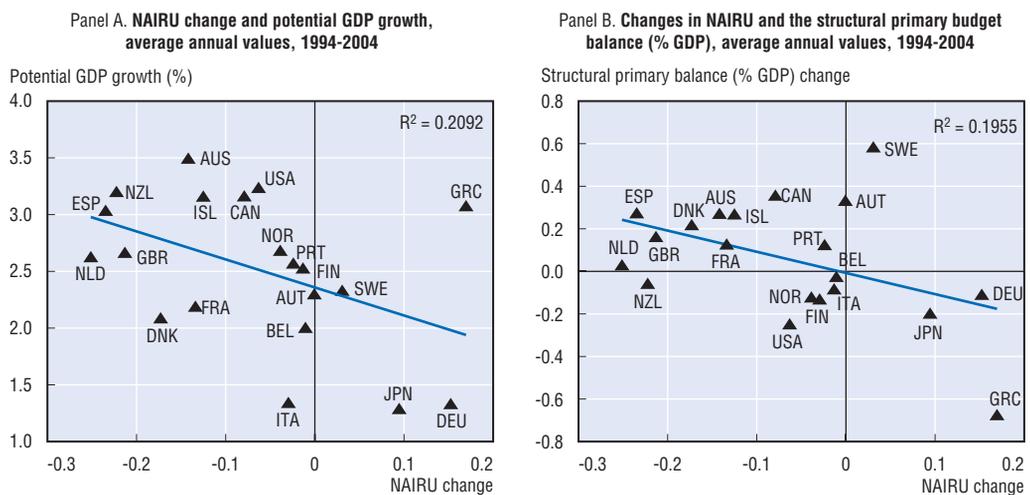
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the other, are taken into account (see Table 6.1). This analysis – which is discussed in some detail in Chapter 7 – confirms that structural reforms in labour and product markets can enhance the resilience of the economy to adverse shocks.

1.2. Labour market reforms improve the macroeconomic and public finance performance

Most OECD countries that have been successful in reducing unemployment during the past decade, have also posted a relatively strong improvement in potential growth, which on its own contributed to improvements of structural budgets by increasing structural tax receipts and/or reducing structural spending on labour market programmes (Figure 6.1).² There are a number of exceptions, however, reflecting changes in fiscal policy. For example, in the Netherlands and New Zealand, the public finance position did not change significantly despite visible improvements in labour market conditions.

Figure 6.1. Unemployment, growth and public finances



Source: OECD Economic Outlook database.

Statlink: <http://dx.doi.org/10.1787/107052754743>

In addition, while structural reforms of the labour market may have reduced unemployment and increased potential growth, it is worth noting that potential growth has also been fostered by a variety of other factors – such as rising productivity because of technical progress. This notwithstanding, recent studies suggest that structural reforms of labour market institutions can exert a strong impact on aggregate employment, potential GDP and public finances (see Box 6.1).

In a similar vein, the OECD Interlink model has been used to simulate the impact of lower structural unemployment on potential growth and public finances.³ The simulations assume that: i) the employment gains take place in the business sector; ii) the economies progressively adjust to the reduction in structural unemployment so that both real wages and real returns to capital go back to baseline in the medium term; and iii) total factor productivity growth is unaffected by the reduction of structural unemployment. The latter two assumptions imply that productivity growth remains constant compared with baseline in the medium term. Therefore, the above three assumptions together imply that the rise of employment above baseline translates one-to-one into higher potential GDP in the business sector.

The medium-term impact on potential GDP and the structural primary budget balance of a 1 percentage point drop in structural unemployment following structural reforms could be significant (Table 6.2). The impact on potential GDP ranges from 1% in Portugal to 1.6% in Norway. The impact is higher in the euro area than in the United States or Japan, reflecting the higher proportion of initial unemployment relative to the business-sector employment. Improvements of structural primary balances range from 0.3% of GDP in a number of countries to 1.2% in Denmark. They depend on the generosity of the unemployment benefit system as well as on the degree of tax progressivity. The impact is thus stronger in Nordic countries and weaker in the United States and Japan while the euro area stands in an intermediate position.

These results are illustrative only and subject to a number of uncertainties. First, they do not take into account a possible increase of the labour supply in response to the fall of structural unemployment. Second, improved budget balances may allow additional reductions in the tax wedge that could strengthen the beneficial impact of labour market reforms.⁴ Third, the initial reduction of structural unemployment in the above simulation was assumed to stem from measures exogenous to the budget, while in reality employment-enhancing reforms are likely to have also an up-front impact on public finances.⁵ For example, decreasing the tax wedge will lead to declining tax revenues in the short run as the labour market and the economy as a whole take time to adjust to the more favourable conditions put in place by the reforms. Moreover, *ad hoc* tax cuts or government subsidies could be implemented in an attempt to compensate those losing from reforms. For the EU-15 countries (except Greece), Deroose and Turrini (2005) estimate that major labour market reforms⁶ implemented during the 1970s through the 1990s have entailed, directly or indirectly, deficit pressures on the public budget, although of relatively low magnitude on average (0.3-0.45% of potential GDP).⁷

Summing up, labour market policies and institutions may partly shape the employment effect of adverse macroeconomic shocks and impinge on the macroeconomic environment. In other words, interactions between structural and macroeconomic policies clearly matter in determining both growth potential and employment. In a similar vein, a review of the impacts of various labour market policies and institutions showed that reforms in these

Box 6.1. The macroeconomic and public finance impact of labour market reforms: a review of selected studies

For the United Kingdom, Barrel *et al.* (2003) use an extension of the National Institute of Economic and Social Research (NIESR) model to estimate the macroeconomic and public finance impact of activation policies. The latter take the form of a reduction in the number of lone parents and disabled people claiming benefits by 5%, bringing them into the labour market. Because of the inflow of these (newly active) job-seekers, real wages would go down compared with the baseline, thus lowering unit costs and domestic prices with positive repercussions on external competitiveness. After five years, output would increase by around 0.2% compared with the baseline and employment by 0.4%. The unemployment rate could remain broadly unchanged because higher output could “encourage” additional inflows of individuals into the labour force. Moreover, the new job-seekers might partly displace job prospects for the currently unemployed, *i.e.* they could take up some of the jobs that the current unemployed would have taken up. Despite a constant unemployment rate, the budget balance would improve as a result of higher output.

The NIESR model has also been used to evaluate the economy-wide impact of the New Deal for Young People programme in the United Kingdom, introduced in April 1998 with the objective of reducing long-term unemployment among the youth (White and Riley, 2002). The fall in long-term unemployment resulting from the programme is estimated to have put downward pressure on real wages, thus allowing aggregate demand to expand without rising inflation. Moreover, wage subsidies and direct government employment creation is also seen to have increased labour demand. Because of these policies, GDP growth is estimated to have increased by around 0.1% per annum since the introduction of the programme, compared with baseline. Thanks to lower unemployment and higher employment and consumer spending, government spending decreased and tax receipts increased, so that the actual costs of the programme are estimated at around 40% of the initially estimated costs (around 0.05% of GDP per annum).

In general, the main channel through which structural reforms are expected to have a major macroeconomic impact is through exerting downward wage pressures. For example, Pichelmann and Roeger (2002) simulate the impact for the EU of a reduction of the wedge between market wages and reservation wages – *i.e.* the wages above which workers are willing to take up jobs – sufficient to reduce structural unemployment by 1%. In the short term, this reduction increases labour demand, the more so the higher the price elasticity of aggregate demand. The increase in labour demand eventually translates into higher output by around 0.6% compared with the baseline and higher employment by 0.8% in the EU as a whole, after 10 years. Similar results are obtained by Roeger and In’t Veld (2004) by assuming a fall in workers’ reservation wage because of a decrease in the unemployment benefit replacement ratio.

In a general equilibrium framework with imperfect competition in both product and labour markets, Bayoumi *et al.* (2004) show that reducing wage mark-ups in the euro area to the US levels would increase both hours worked and per capita GDP by around 3.5% above the baseline, in the medium term. Such policies would also have positive spill-over effects on the US economy because of improvements of its terms of trade.¹

A fall in structural unemployment thanks to reforms would have a much stronger macroeconomic impact if the rise in employment “encourages” more individuals to search for a job, thus boosting labour force participation. The European Commission (2002c) assumes that reforms reducing structural unemployment by 1 percentage point could also

Box 6.1. The macroeconomic and public finance impact of labour market reforms: a review of selected studies (cont.)

gradually increase the participation rate in EU countries by 1.5 percentage points. The result would be an increase of employment above the baseline by slightly less than 3.5% after 10 years.² Johnson and Downes (1994) estimate for Australia that a fall in structural unemployment by 1 percentage point could progressively “encourage” an increase of the labour force by 1.4% in the medium term compared to the baseline. This increase in labour supply would add further downward pressure on before-tax real wages so that both employment and GDP would rise by 2.5 percentage points above the baseline.

1. Bayoumi *et al.* (2004) also show that reducing the price mark-ups in the euro area to US levels would lead to even bigger benefits as it would increase hours worked by 4.5% and per capita GDP by around 8.5% compared with the baseline. Positive spill-over effects on the US economy would also be higher. The authors estimate that reductions of both price and wage mark-ups in the euro area towards US levels would halve the difference in per capita GDP between the United States and the euro area.
2. The European Commission (2002c) also assumes that the average productivity of new employees is 80% of that of existing workers. Therefore, the increase in GDP compared to the baseline (2% after 10 years) would be lower than the rise in employment.

Table 6.2. Medium-term impact of a 1 percentage-point reduction in structural unemployment on potential growth and budget balance

	Percentage points	
	Potential GDP ^a	Cyclically adjusted budget balance ^b
Australia	1.2	0.3
Austria	1.2	0.3
Belgium	1.3	0.8
Canada	1.4	0.5
Denmark	1.5	1.2
Euro area	1.3	0.6
Finland	1.5	0.9
France	1.4	0.6
Germany	1.2	0.6
Greece	1.3	0.6
Iceland	1.3	0.6
Ireland	1.2	0.4
Italy	1.3	0.6
Japan	1.1	0.3
Netherlands	1.2	0.8
New Zealand	1.2	0.5
Norway	1.6	1.0
Portugal	1.0	0.4
Spain	1.3	0.5
Sweden	1.5	1.0
Switzerland	1.1	0.3
United Kingdom	1.3	0.7
United States	1.2	0.3

a) In the business sector.

b) Deviation in percentage points from levels in medium term scenario of OECD (2005), *OECD Economic Outlook*, No. 77, June, Paris.

Source: OECD simulations (see text).

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areas can have significant beneficial macroeconomic effects. In turn, this can provide a basis for further reforms and set in motion a “virtuous” circle, whereby earlier reforms create the fiscal conditions for enacting further reforms.

2. Policy interactions and packages

The 1994 Jobs Strategy recommendations encompassed a broad range of policy prescriptions on labour market issues, but left the question of the precise balance between the different policy planks open. However, it was sometimes interpreted as endorsing the view that there was only one right institutional configuration for achieving good employment outcomes (see for instance Freeman, 2005).

The 1994 Jobs Strategy stressed the importance of co-ordinating policy planks in a number of labour market areas, but it did not elaborate much on the implication of possible interactions between labour- and product-market policies and institutions. Since then, there has been an increasing body of empirical evidence about the existence of such interactions. Chapter 3 of this report also points to apparent interactions between and among policies and institutions (*e.g.* some countries have achieved high employment despite offering generous unemployment benefits, by combining high replacement rates with certain forms of employment protection and a strong emphasis on activation policies). Accordingly, the employment outcomes of some policies and institutions may mutually reinforce or, on the contrary, offset each other. This does not necessarily call into question the intrinsic effect that individual policy planks may have on labour market performance, but may partly explain why countries with different policy settings appear to achieve similar employment outcomes.

2.1. Existing policy packages and employment performance

Cross-country panel regression studies, notably Bassanini and Duval (2006), show that there is a relationship between policies and employment outcomes. However, such findings are valid for the “average” country, which leaves open the possibility that countries may achieve equally good results by following different strategies. The question then arises as to how, in practice, countries can take advantage of possible synergies or compensating mechanisms between policies and institutions, so as to implement coherent policy packages.

As a first approximation, simple statistical techniques are used to identify empirical regularities in the data without any theoretical priors regarding the functioning of labour markets (see Annex 6.A1). This descriptive analysis, though not implying any causality links, suggests that four different regimes of labour market functioning can be identified within the OECD area, at the beginning of the 2000s (see Table 6.3):

- First, and in line with the base-case estimates described in Chapter 7, less strict product market regulation and relatively low tax wedges and unemployment benefits are associated with good labour market performance in a number of English-speaking countries. In addition, the latter tend to exhibit relatively light employment protection legislation and low-to-moderate expenditures on active labour market programmes. Union density as well as collective bargaining coverage tend to be below average in these countries.
- Second, some European countries appear to achieve equally good employment outcomes with extremely different policy settings. These countries tend to be characterised by centralised and co-ordinated systems of industrial relations, with a high degree of coverage of collective agreements and often strong emphasis on social dialogue (Auer, 2000). Unemployed workers benefit from a solid and comprehensive safety net, where relatively generous unemployment benefits go hand-in-hand with solid activation strategies. On the demand-side, these countries tend to exhibit, on average, relatively less strict product market regulations and moderate to high levels of tax-wedges and employment protection.⁸

Table 6.3. **Four different regimes of labour market functioning^a**

	OECD unweighted average	High employment outcomes		Low employment outcomes	
		English-speaking countries, mainly ^b	North European countries, mainly ^c	Countries of continental and southern Europe, mainly ^d	Countries of eastern Europe ^e
Employment protection legislation	2.01	1.38	2.13	2.71	1.83
Generosity of unemployment benefit system ^f	27.81	18.23	39.86	36.17	9.69
Active labour market programmes ^g	29.25	15.76	64.14	25.84	3.46
Tax wedge ^h	27.10	18.54	27.42	34.33	32.43
Union coverage	59.96	30.75	83.33	82.57	38.33
Union co-ordination	2.88	1.88	3.92	3.79	1.33
Product market regulation	1.42	1.20	1.28	1.55	1.97
Employment rate	67.11	70.92	71.91	62.54	58.00
Unemployment rate	7.47	5.30	4.79	8.97	15.12
Total LMP expenditures ⁱ	1.86	0.98	2.68	2.60	0.82
of which: ALMP expenditures ^j	0.76	0.39	1.31	0.94	0.25
Income inequalities (Gini index) ^k	29.35	31.50	25.58	29.85	31.35
Relative poverty rate ^l	9.64	11.78	7.77	9.86	7.05

- a) This country classification is derived from a Principal Component Analysis (see Annex 6.A1), a simple statistical technique which helps to identify existing combinations of policy settings and to highlight similarities and differences across countries. However, some countries are barely representative of the group of countries to which they belong, being close to the frontier between two regimes of labour market functioning. This is for instance the case for Austria, Finland, Germany, Ireland, Japan, Korea, Portugal, Sweden and Switzerland, as shown in the Annex 6.A1.
- b) This group of countries includes Australia, Canada, Japan, Korea, New Zealand, Switzerland, the United Kingdom and the United States.
- c) This group of countries includes Austria, Denmark, Ireland, the Netherlands, Norway and Sweden.
- d) This group of countries includes Belgium, Finland, France, Germany, Italy, Portugal and Spain.
- e) This group of countries includes the Czech Republic, Poland and the Slovak Republic.
- f) 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), over a five-year period of unemployment.
- g) ALMP expenditures per unemployed workers as a percentage of GDP per capita.
- h) Tax wedge between the labour cost to the employer and the corresponding net take-home pay of the employee for a couple with a dependent spouse and two children earning 100% of APW earnings.
- i) Total expenditures on active and passive measures as a percentage of GDP.
- j) ALMP expenditures as a percentage of GDP.
- k) Gini index for total population. Not available for Korea and the Slovak Republic.
- l) Calculated as the proportion of the population with income below 50 % of the current median income. Not available for Korea and the Slovak Republic.

Source: See Bassanini and Duval (2006).

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- Third, labour market performance is below the OECD average in a number of countries of continental and southern Europe, which stand out for having relatively high tax-wedges and stringent employment protection and product market regulations, while devoting less emphasis to activation policies than is the case in the previous group of countries – despite the fact that some of them have generous unemployment benefit systems. In addition, the coverage of collective agreements tends to be high and, in most cases, supported by important legal extension mechanisms (Brandt et al., 2005).
- Fourth, in transition economies of eastern Europe, poor employment outcomes are associated with, on average, very low expenditures on both active and passive labour market programmes, but high tax wedges and relatively stringent employment protection and product market regulations. By contrast, trade unions play a relatively minor role in these countries.

While this four-way classification of countries bears a distinct resemblance to previous analyses (see for example Esping-Anderson, 1990; and more recently, Sapir, 2005), it is worth noting that such broad classifications are somewhat arbitrary. In particular, they rely on a limited set of policy indicators, which do not account for important – but difficult to measure – aspects of the labour market framework, as for instance, the integration of active and passive policies. Moreover, the present classification does not account for policy changes and progress achieved in a number of countries over the recent years and, more generally, it does not allow to link employment outcomes to policy changes.

This notwithstanding, two striking facts emerge from Table 6.3 when looking at the two groups of countries with good labour market performance. First, on average, extremely different degrees of “interventionism” in almost each selected policy area (with the exception of product market regulation) may lead to very similar employment and unemployment rates. This suggests that there is not a single road for achieving good employment performance. Second, the approach of the second group of countries (North European countries) has a clear budgetary cost. In these countries, governments spend on both active and passive employment measures about 2.5 times more, as a percent of GDP, than is the case in countries belonging to the first group (mainly English-speaking countries). And, as regards active measures only, expenditures are more than three times higher. On the other hand, income inequalities as well as relative poverty rates appear to be lower than in the first group of countries.

2.2. Policy interactions

Obviously, it is not possible to draw policy conclusions on the basis of the above simple associations and more sophisticated analysis is needed to deliver clearer conclusions. To this end, econometric research has been carried out in search for robust interactions between policies and institutions on the one hand, and employment outcomes on the other. Chapter 7 presents empirical findings on interactions and complementarities between specific combinations of policies and identifies several important examples.

More generally, there is evidence that any reform that increases employment is likely to be complementary with *all* other employment-enhancing reforms.⁹ In other words, the impact of a reform will be low (high) if all institutions are adverse (favourable) to employment, no matter which exact combination of institutions is responsible for the adverse (favourable) pattern. Bassanini and Duval (2006) show that taxes, unemployment benefits, product market regulation and union density are complementary with one another. For example, Table 6.4 simulates the additional gain that would be obtained by undertaking jointly two reforms that would each reduce unemployment by 1 percentage point if implemented separately.¹⁰ All possible combinations of two such reforms, while keeping an unchanged policy stance as regards to the other two, yield a total reduction of unemployment between 2.25 and 2.37 percentage points for the “average” OECD country, instead of 2 percentage points when interaction effects are not taken into account. In other words, policy complementarities are estimated to amplify the unemployment effects of separate reforms by 12% to 19%.

The following main findings seem to emerge from the quantitative analysis of the impact of institutions and policies on labour market performance:

- Several policies and institutions that affect mainly the demand-side (*e.g.* the tax wedge and product market regulation) appear to have unambiguous negative effects on labour market performance.

Table 6.4. **Simulated effect of reform complementarities**

	Unemployment benefits	Tax wedge	Union density	Product market regulation
Unemployment benefits				
Tax wedge	-0.30			
Union density	-0.37	-0.26		
Product market regulation	-0.36	-0.25	-0.33	

Note: The table shows the reduction in unemployment (in percentage points) that would be obtained from the combined reform of each of the indicated pairs of institutions, in excess of the sum of the unemployment reductions implied by each reform taken in isolation. As a standardisation, reforms are set in such a way that each of them, taken in isolation, would bring about 1 percentage-point drop in the unemployment rate for the average country.

Source: Bassanini and Duval (2006).

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- Different combinations of supply-side policies deliver similar employment outcomes. More specifically, a policy mix with low unemployment benefits and low investment in active labour market programmes appears to perform no better than a policy mix with high unemployment benefits and high investment in active labour market programmes, combined with tight monitoring of job-search behaviour.
- There is some evidence that comprehensive structural reforms yield greater employment gains than separate, “piece-meal” reforms, although the magnitude of such policy complementarities is found to be moderate for the average OECD country.

Thus, the analysis suggests the existence of two broad alternative employment-enhancing reform strategies that, by and large, resemble each other in terms of demand-side policies, but differ with respect to supply-side policies. All strategies not geared at substantially removing barriers from the demand-side (e.g. barriers to competition) appear to be unambiguously suboptimal. In one of these successful strategies (well represented by a handful of English-speaking countries), reforms are designed to strengthen market mechanisms on both demand- and supply-side. In the other successful strategy, *substantial* removal of barriers from the demand-side is coupled with an “interventionist” policy on the supply side, with relatively generous active and passive programmes, which are nonetheless integrated to contain disincentive effects. This approach is well represented by certain European countries, such as Denmark and to a lesser extent, the Netherlands. In both countries, moderately-low product market regulations do not constitute major barriers to competition, but tax-wedges remain relatively high. That said the distortionary effects of labour taxes may be lower in these economies, where centralised and co-ordinated systems of industrial relations may allow workers to recognise the linkage between the taxes that they pay and the benefits that they receive (Summers *et al.*, 1993). And, for similar reasons, generous unemployment benefits are less likely to translate into excessive wage claims since trade unions may well internalise outsider interests in wage negotiations.

The latter approach, however, while offering more room for manoeuvre to guarantee high degrees of social protection and small income inequality, involves large public expenditures that must be financed. For this reason, it is unlikely to be viable in countries where the tax pressure is already high, without major and successful efforts to improve the efficiency of public spending. Furthermore, the feasibility of each reform strategy might also depend on political-economy considerations, including the quality of industrial relations, that will be discussed in the next section.

3. Political economy of reforms

Most labour market institutions were first introduced with the aim of enhancing workers' welfare and improving employment conditions, influencing both the way total income is shared between different socio-economic groups and employment outcomes (see *e.g.* the seminal work by Layard *et al.*, 1991). In this section, the political economy of reforms will be discussed as part of this general framework of labour market analysis. Important considerations, more specifically related to political and social sciences, will be largely ignored, as they lie outside of the scope of this report.

Heterogeneity in the population and the existence of different interest groups appear crucial to explaining political resistance to structural reforms (Alesina and Drazen, 1991). Some groups of individuals or enterprises may end up worse off as a result of product or labour market reforms, even as others benefit from new institutional arrangements and overall efficiency improves. This heterogeneity in the distribution of the benefits and costs means that the political viability of a reform depends on the relative political influence of the potential winners and losers.

In addition to this “distributional” effect, costs and benefits of structural reforms may arise at different points in time and through more or less direct channels. As an illustration, a recent study from the IMF suggests that labour market “deregulation” tends to increase unemployment in the short run and reduce it in the long run. More precisely, the unemployment rate would start to decrease two years after the introduction of policy changes and the beneficial effects of the measures would take several years to fully materialise (International Monetary Fund, 2004). In a similar vein, Elmeskov *et al.* (1998) underline that in a number of OECD countries that began introducing labour market reforms in the early to mid-1980s, structural unemployment fell over the entire subsequent decade. In this respect, the idea that people tend to be more confident about the direct or short-term effects of policies than about the indirect or long-term ones is relatively widespread (Bean, 1998; Blanchard, 2004; Saint-Paul, 2004). Thus, this “timing/perception” effect may also impinge on the political feasibility of reforms.

3.1. Distributional and timing effects

Both the distributional and the timing effects of structural reforms may vary depending on the institution or policy considered. This probably explains why implementation has been uneven across different components of the 1994 Jobs Strategy reform agenda, even as most OECD countries have undertaken reforms in line with at least some of the policy guidelines during the past decade (see Chapter 3).

Reform patterns and the number of potential losers

Governments have been particularly reluctant to introduce policy changes in areas such as employment protection legislation for permanent contracts or wage-setting systems. Such reforms are likely to be faced with strong opposition since the resulting costs arise before the benefits and mostly affect incumbent employees, *i.e.* the majority of voters. Indeed, policy changes in these areas imply weaker job security and the risk of income losses, which appear as soon as the reform is enacted. By contrast, the beneficial job creation effects only emerge gradually. And while such structural reforms may benefit the incumbent employees, insofar as some of them may lose their job in the future, they are unlikely to look that far ahead.

Likewise, governments have been hesitant to prohibit employers from using mandatory retirement – in countries where such practices exist. Indeed, it may be in the interest of individual employers to terminate workers' contracts after a certain age – even though these workers may wish to carry on working and may have the skills to do so. Such practices, however, run counter the overarching objective of postponing retirement in line with improved longevity, which would benefit the economy and society as a whole.

Moreover, uncertainty about the reform effects may reduce the political acceptance of new institutional arrangements. This is especially the case when reforms are not perceived as being well designed and when the rationale for reforming is not clearly explained. Moreover, there may be a bias toward the status quo and against reform whenever the individual gainers and losers – or at least some of them – cannot be identified beforehand (Fernandez and Rodrik, 1991).¹¹

Structural reforms, from which costs arise first whereas benefits come later, may encounter less political opposition if the burden of the policy change is borne initially by the unemployed. The latter are less likely than employers or incumbent employees to form a political majority capable of blocking the reform, since they are less numerous and often less organised.

By contrast, labour tax reductions tend to be more widely accepted by the population. This is probably why many countries have undertaken reforms in this policy area during the past decade. Even if the expected beneficial effects may take time to materialise, these measures entail no explicit or immediate costs for any category of workers or employers. They primarily impact on public finances. Thus, the government may be seen as the main loser while the burden of the reform remains virtually a shadow cost for the population as a whole. Indeed, whereas these measures are likely to imply reductions in public expenditure in the future or tax increases in some other areas, funding issues involve the complex process of the overall public budget balance, and they rarely emerge in an explicit manner in the public debate at the very beginning of the reform.

The role of special interest groups

Generating consensus for reforms may also suffer from the “collective action” problem that the costs of reforms are concentrated on relatively small and well-organised target groups, while the benefits tend to be diffused over a larger but more heterogeneous electorate (Olson, 1965). Indeed, a diverse array of groups, including groups of bureaucrats, entrepreneurs and workers, may oppose structural reforms in order to preserve their own interests:

- Public sector reforms such as reorganisation or contracting out of public services can represent a threat to the interests of certain public employees. A study for Norway by Rattso and Sorensen (2004) finds that public employees are less likely to support reform in the public sector than the rest of the population. The probability of such reforms taking place in a particular area was found to be negatively related to the share of public employees in that area.
- As regards product market regulation, special interest groups or lobbies may contribute to shape the regulatory framework by either exerting direct control or lobbying politicians and government officials that take decisions in this domain. As noted by Nicoletti (2005), there are sometimes close ties between natural monopoly industries – such as energy, telecommunications or railways – and local or central governments. And in more competitive industries – such as road freight, retail distribution or professional services – trade associations have been often able to develop effective lobbying groups.¹²

- Minimum wages provide another case in point. While minimum wage legislation directly affects a minority of incumbent employees, reforms in this area may be seen as giving priority to efficiency criteria over equity concerns and are likely to be strongly opposed by trade unions.

More generally, as far as labour market institutions are concerned, the quality of industrial relations and the extent to which trade unions and employer organisations share common views on how the labour market functions and are able to agree on common objectives may play a key role as regards labour market performance in general, and the political feasibility of reforms in particular. Indeed, Blanchard and Philippon (2004) suggest that the quality of labour relations, *i.e.* the quality of the dialogue that firms and unions have, may partly explain the evolution of unemployment across European countries over the past 30 years. To take another example, Auer (2000) underlines that, in Denmark, Ireland and the Netherlands, the employment recovery achieved over the 1990s went hand-in-hand with greater emphasis on social dialogue. In these countries, centralised and co-ordinated systems of industrial relations, involving strong co-operation between social partners and the government, may have helped, at least in part, to pass key reforms in a way which aligned different interests of specific groups with the interests of society and the economy as a whole. As a consequence, social partners have been engaged in policy changes that have not always been easy to accept by all parties concerned (see Box 6.2).

3.2. The role of policy design in overcoming adverse distributional and timing effects

Governments have followed different strategies to cope with potential political opposition to reform. Partial reforms at the first stage of the process may have been more or less successful in gathering political support for further and deeper policy changes. In most cases, reforms were introduced gradually, taking advantage of potential compensating mechanisms and political complementarities between different policies and institutions.

Partial reforms: reforming at the margin as a way to implement further and deeper policy changes

To avoid conflicts with key constituencies, governments may first introduce reforms at the margin of the core labour market while keeping existing institutional arrangements for incumbent employees virtually intact. This tends to reinforce labour market duality, which in turn may gradually build up public support for subsequent reforms to core labour market policies and institutions. Reforms of employment protection legislation (EPL) that were implemented in a number of OECD countries over the past few decades are a typical example of such a strategy (Saint-Paul, 2000; Dolado *et al.*, 2002). As discussed in Sub-section 3.3 of Chapter 3, the most prevalent path of reform consisted in facilitating the use of fixed-term contracts and/or the recourse to workers hired from temporary agencies while leaving existing provisions for permanent or regular workers virtually unchanged. As a result, in countries where dismissal laws for permanent workers were overly restrictive, notably in Portugal and Spain, the share of temporary workers in total employment grew markedly, which seems to have paved the way for subsequent reforms to EPL for permanent workers (Box 6.3). In the specific case of the Spanish EPL reforms, Dolado *et al.* (2002) clearly show that, as from 1993 (and until 1998), the ratio of employees under permanent or regular contracts relative to the whole labour force was lower than 0.5, which may have opened a “window of opportunity” for the reform that later took place. However, it is worth noting that in both countries, dismissal laws have remained fairly strict by OECD standards and still are associated with a comparatively high degree of labour market duality.

Box 6.2. The quality of industrial relations and the political feasibility of structural reforms: selected examples of Denmark, Ireland and the Netherlands

In Denmark, Ireland and the Netherlands, concerted efforts by governments and the social partners led to the conclusion of social pacts: the first was concluded in 1982 in the Netherlands (the Wassenaar Agreement), followed by the “Declaration of Intent” in Denmark and the “Programme for National Recovery” in Ireland, both signed in 1987. As noted by Auer (2000), underlying these pacts, was the willingness of the partners to tackle the problems facing the economy through a concerted approach based on wage moderation and a boost in competitiveness, while maintaining but reforming the Welfare State.

In Ireland, wages have been co-ordinated through a series of Central Agreements involving the trade unions and employers (as from 1987). At the core of these agreements has been the acceptance by trade unions of relatively modest increases in wages. In return, the government agreed to reduce the tax burden on workers, allowing take-home pay to rise faster than otherwise (Glyn, 2005).^{*} In the Netherlands, as part of the Wassenaar Agreement, trade unions agreed to give up wage indexation and to moderate wage claims. Along the same line, the statutory minimum wage was cut by 3% in 1984 and then frozen until 1989. In compensation, employers agreed to expand the opportunity for part-time work (Nickell and van Ours, 2000). In Denmark, trade unions have agreed to changes in welfare systems which have not always been in the short-term interests of their members. For instance, unemployment benefit duration was reduced from nine to four years over the period 1994-1999. Likewise, in the Netherlands, as from the late 1980s, the legislation concerning sanctions for unemployment benefits was significantly tightened, leading to an increase in the number of benefit sanctions from 27 000 in 1987 to 140 000 in 1994. As from the mid-1990s, unemployment benefit administration was also tightened in Ireland and activation measures were introduced (OECD, 2003a, Chapter 4).

^{*} However, these agreements have taken place against an environment where union power was waning in the private sector due to the increased importance of international, and foot-loose, companies in the Irish economy so it is not clear if social dialogue *per se* was the critical factor.

Looking for compromise: offering compensations

Governments should be able to overcome the resistance of potential losers from reforms by implementing compensating schemes, as for instance, in the spirit of the recent Austrian reform of severance pay legislation. In this country, the employer is no longer required to provide a compensation at the time of dismissal. Instead, employers have to pay a monthly contribution into “individual severance accounts”, which can be cashed by the worker at the time of dismissal. The new system helps ensure adequate income security for workers, while at the same time facilitating job mobility (see Sub-section 3.3 of Chapter 3).

There is also tentative evidence that workers tend to feel more secure in countries that spend more on passive and/or active labour market measures, while overly stringent EPL does not necessarily increase workers’ perception of employment security (see OECD, 2004a, Chapter 2). Thus, successful activation strategies could pave the way for EPL reforms in building up a comprehensive and effective safety net for job losers. However, designing an effective and coherent system of active measures may require considerable fine-tuning. Thus, deep reforms to overly generous unemployment benefit systems that entail significant cuts in benefit levels or duration are likely to gather more political support if they are implemented gradually and include temporary “welfare compensating” schemes, as in Denmark (Box 6.4).

Box 6.3. Reforming at the margin to pave the way for further policy changes: the EPL reforms in Portugal and Spain

Portugal and Spain stand out for having over the past few decades passed the most substantial reforms to dismissal laws among OECD countries, both starting from a particularly strict legislation (OECD, 2004a, Chapter 2). Both countries have followed a similar path of reforms. In Portugal, the recourse to fixed-term contracts was liberalised in 1976. Then, in 1989/1991, the rules on dismissals and the legal regulation of temporary work were relaxed while at the same time counterbalancing this by restricting the use of fixed-term contracts. Firing restrictions were eased through a wider range of lay-off motives and the abolition of prior authorisation for collective dismissals (OECD, 1999a). At that time, one in six employees was a temporary worker, which was very high by OECD standards. This may have placed insiders in a weaker position to oppose the reform since temporary workers together with the unemployed were relatively numerous (OECD, 2002, Chapter 3). In Spain, restrictions on the use of fixed-term contracts were eased substantially in 1984. Reforms reducing employment protection for workers with permanent contracts were implemented in 1994 and 1997, in exchange for further restrictions in the use of temporary contracts (in 1994 and 2001), when the latter accounted for one-third of employment. Objective grounds for collective redundancies were extended and procedural requirements made less time-consuming. Finally, maximum compensation pay for unfair dismissal was reduced in 1997 (OECD, 1999a, Chapter 2; and 2004a, Chapter 2).

Box 6.4. Smoothing political opposition by implementing reform gradually and through balanced approaches: the reform of unemployment insurance in Denmark

Over the past decade, Denmark has substantially reduced unemployment benefit duration. And this has been done while implementing a compensation strategy for the unemployed that did not rely on ALMP only. First, the reform was *gradually* implemented in that benefit duration was first reduced from nine to seven years in 1994, then was further cut down to a maximum of five years in 1996 and finally, went down to four years in 1999. Second, while the activation principle was progressively reinforced over the three stages of the reform, the initial phase of reduction in benefit duration was compensated by the introduction of several long-term leave schemes for workers. Indeed, workers saw in these measures an increase in the possibilities of allocating their time between work, training and leisure. The unemployed considered the potential positive impact of these schemes on their ability to get a job. Some of these leave schemes were abolished subsequently, once the positive effects of the unemployment benefit reform became visible (Carcillo *et al.*, 2005).

Moreover, gradualism may help gather political support for new institutional arrangements by carrying information about the reform effect, thus reducing uncertainty about the size and the distribution of costs and benefits (Tommasi and Velasco, 1995). This, however, implies tight follow-up and rigorous policy evaluation.

Co-ordinated reforms

From a political economy perspective, various policies and institutions may be complementary in the sense that the existence of one of them increases political support for another (Saint-Paul, 2000). Thus, in principle, certain reform packages may help weaken

resistance to reforms. The United Kingdom and New Zealand provide interesting examples in this respect. In both countries, deep changes to the system of industrial relations have been part of the reform package – as a way to facilitate the adoption of other reforms (Box 6.5). It is also noteworthy that the reform process started in a context of severe economic crisis that probably helped to overcome resistance to structural reforms in strengthening the argument that existing policies could no longer be sustained. Such co-ordinated reforms are rare, however. And evidence on changes in bargaining structures calls into question the political feasibility of the first stage of such a reform process, that is the reform of industrial relations by direct government intervention.¹³

Box 6.5. Co-ordinated reforms in the United Kingdom and New Zealand in the 1980s and early 1990s

Over the 1980s, the British government introduced a sustained series of measures – eight major Acts of Parliament between 1980 and 1995 – imposing a legal framework on union activities and organisation. These legislative changes progressively restricted insider power through curbs on unions rights and privileges. A range of structural reforms were then implemented, notably affecting employment protection rights for permanent workers and minimum wage legislation (Gregory, 1998). In 1985, the minimum employment period for workers to claim unfair dismissal was extended from six months to two years and the final abolition of Wages Councils in 1993, after years of threat, removed the only form of minimum wage protection which then existed for low-paid workers. However, a general statutory minimum wage was introduced in 1999.

In New Zealand, the reform process started in the mid-1980s with a reorientation of macroeconomic policies and a liberalisation of financial and product markets. Labour market reforms followed in the early 1990s (International Monetary Fund, 2004). The Employment Contracts Act, which was enacted in 1991, introduced a number of restrictions on the ability of unions to intervene in industrial relations and to engage in industrial action. Major reforms in the welfare system were implemented at about the same time. In particular, eligibility criteria for unemployment-related benefits were tightened and benefit levels reduced. While reductions were not uniform across demographic groups and programmes, in a number of cases, benefits were cut significantly. For example, the maximum unemployment benefit available to single adults between the ages of 20 and 24 without dependent children fell by 25% in 1991. Overall, Maloney (2000) suggests that, on average, benefits were cut by 9.1% over the first half of the 1990s.

By contrast, there is evidence that product market liberalisation tends to facilitate changes in a range of labour market policies (Hoj *et al.*, 2006). And indeed, several countries which have undertaken labour market reforms recently had also deregulated their product markets beforehand (Brandt *et al.*, 2005). Intensified competition lowers product market rents and thereby the scope for rent sharing between employers and workers, which may gradually reduce the support for labour market institutions aimed at capturing or preserving these rents (Blanchard and Giavazzi, 2003). However, as pointed out by Blanchard and Philippon (2003), adjustment to the change in the environment may take time, and in this respect it is worth noting that, in a number of countries, labour market reforms have been comparatively more limited than changes in product market regulation. Moreover, at the first stage of the process, product market reforms may also be faced with strong opposition and, as noted in Hoj *et al.* (2006), they may require a well-designed sequencing of sectoral policy changes. For instance, it

may be useful to cope first with producers of intermediate inputs (*e.g.* freight transport), before moving to reforms that affect final consumer products (*e.g.* passenger transport) which are more likely to be faced with opposition from consumer constituencies insofar as they may generate quality concerns or fears about distributional effects.

The business cycle and the political feasibility of structural reforms

The 1994 Jobs Strategy recognised that “the best moment for the introduction of structural reforms is never obvious”. Both economic recessions and expansions have their own advantages and drawbacks in this respect. As underlined by Drazen and Grilli (1990), the welfare losses associated with economic distortions and crises may help to overcome ongoing social conflict and political stalemate over needed reforms. In other words, high unemployment would increase incentives for co-ordinated collective actions in order to put the economy on a welfare superior path. However, weak labour market performance may increase workers resistance to reforms that have re-allocative consequences by strengthening their support for protective measures even if the latter are inefficient and contribute to high unemployment (Olson, 1965; Saint-Paul, 1998).

More generally, weak macroeconomic conditions may diminish public support for structural reforms insofar as they are likely to delay their beneficial effects on employment. Indeed, during the upturn of the cycle, concern about the effects of certain reforms may be somewhat attenuated (Bean, 1998). For instance it may be easier to reform unemployment benefit systems during upturns, when the outflow rate from unemployment tends to be relatively high and governments may face less budgetary constraints to implement ALMPs. On the other hand, when economic conditions are good, the need for change is less obvious, even if change in these periods would be much less painful.

Overall, this suggests that the political support for structural reforms would be highest right *after* a recession, *i.e.* at the beginning of the economic recovery. Recent studies find a positive association between high unemployment and the advent of economic crises on the one hand, and the propensity to undertake structural reforms on the other (International Monetary Fund, 2004; Duval and Elmeskov, 2005). Economic crises may improve awareness of the existence of inefficient policy settings. The economic recovery that follows the crisis may offer room for manoeuvre for pursuing the reform process. In this respect, accompanying fiscal or monetary policies can make it easier to sell the required reform in the first place, by fostering economic growth and job creation.

Notes

1. Care must be taken, however, in interpreting these findings. The fact that these shocks are estimated to have a significant impact on unemployment does not necessarily imply that labour market performance can be persistently affected by long-run changes in macroeconomic variables. In fact, the macroeconomic variables considered in the analysis of the Bassanini and Duval (2006) are simply “shocks”: in some cases, they are mean-reverting by construction (such as TFP); in other cases, they are characterised by an historical pattern of stationarity (such as real interest rates).
2. The impressive performance of Ireland in terms of NAIRU changes (a yearly -0.8% on average) during the period 1994-2004 influences significantly the correlations and therefore this country is not included in the figure. On the one hand, Irish potential growth over the same period has been more than 7% and this would more than triple the correlation between NAIRU changes and potential growth. On the other hand, the structural primary balance in Ireland has deteriorated during the past decade, so that by including this country the correlation between NAIRU and structural primary balance changes would become almost zero.
3. See Turner *et al.* (1996) for a description of the supply side of the Interlink model.

4. However, it should be kept in mind that the impact of a reduction in the tax wedge could vary across countries. For example, Chapter 7 shows that reductions of tax wedge would be most effective in countries with higher minimum wages or a higher degree of corporatism.
5. For instance, for the OECD countries considered in Bassanini and Duval (2006), a fall in structural unemployment of 1 percentage point would require labour-tax cuts of the order of 3.5% on average. As the private-employee and self-employed income share in total GDP is around 50% for these countries on average, this cut would entail non-negligible up-front budgetary costs of around 1.75% of GDP. Moreover, comparing these costs with medium-term budgetary benefits in Table 6.2 suggests that this measure would not be self-financing, even in the medium-term. Therefore, other budgetary measures would be needed to offset both short- and medium-term budgetary costs stemming from this type of reform.
6. Major labour market reforms are defined as those having an impact on labour market regulation indicators above the median or the mean.
7. The possibility that reforms could have a negative impact on the budget in the short-run has been explicitly recognised by the amended Stability and Growth Pact endorsed by the EU Finance Ministers in early 2005. Among other provisions, the amended Pact establishes that major structural reforms can represent a reason for deviating from the medium-term public finance objective.
8. Denmark and the Netherlands are the most striking examples of this regime of labour market functioning. Along this line, the Danish approach of “flexicurity” has proved to be rather effective in guaranteeing sufficient dynamism in the labour market – notably thanks to moderate employment protection legislation, allowing for a high degree of job mobility – and keeping unemployment low, while providing relatively high social protection. By contrast, the functioning of the Dutch labour market is less clear-cut. While few restrictions are placed on the use of temporary work, employment protection provisions for permanent workers are rather strict and likely impinge on transitions to employment. This may have been translated into – and possibly, partly counterbalanced by – overly high expenditures on active programmes for the unemployed.
9. Provided that this reform does not change the sensitivity of either wage claims or labour demand to market conditions in such a way to thoroughly counter this effect.
10. That is, simulations consider reductions by 6.7, 5.6 and 12.6 percentage points for the tax wedge, the average gross replacement rate and union density, respectively, as well as by 3.3 standard deviations for product market regulation. Such reductions are fairly large from an historical perspective, in-so-far as they exceed in each case the average change observed in OECD countries over the past two decades.
11. For example, while reducing employment protection for permanent workers may potentially threaten job security of all incumbent employees, such a reform will only affect those workers that overly strict dismissal provisions maintain in unproductive jobs. However, the frontier between productive and unproductive jobs is rather unclear and uncertainty, about which jobs will be destroyed, may lead to most incumbent employees opposing the reform.
12. Moreover, these special interest groups have been successful in gathering support from consumers by arguing that regulation is essential for securing quality, safety, security and equity of supply. Price subsidisation has also tended to rally some consumer groups behind existing regulatory arrangements (see also Hoj *et al.*, 2006).
13. As noted in Sub-section 3.1 of Chapter 3, changes to bargaining structures have been rather modest and were often prompted by the social partners themselves or occurred as a result of changes in behaviour adopted by individual agents, rather than being a result of government reform programmes (see also Brandt *et al.*, 2005).

ANNEX 6.A1

Principal Component Analysis of Policy Packages and Employment Performance

Principal Component Analysis (PCA) is part of a family of statistical techniques (factor analysis), primarily developed for analysing relationships among a number of measurable entities. It aims at reducing a set of observable variables in terms of a small number of latent factors. The underlying assumption is that there exists a number of unobserved latent variables or “factors” that account for most of the correlations among observable variables.

To take a simple example, the relationship between two variables can be analysed by fitting a regression line into a scatter-plot. This line represents the “best” summary of the linear relationship between the variables. It can be interpreted as a latent factor that captures most of the “essence” of the two variables in that the total variance is maximal on the regression line. In a sense, the two variables are “reduced” to one factor (the latter being a linear combination of the two variables). This example illustrates the basic idea of PCA. When extending this two-variable case to multiple variables, the computations become more involved, but the basic principle of expressing two or more variables by a single factor remains the same (see Box 6.A1.1).

Figure 6.A1.1 gives a synthetic picture of heterogeneity in policy settings and performance of labour markets, as observed at the beginning of the 2000s within the OECD area. The results are derived from a Principal Components Analysis and help to identify existing combinations of policy settings (Panel A) and to highlight similarities and differences across countries (Panel B). The analysis is based on the same set of policy indicators used by Bassanini and Duval (2006) for their base-case estimates.* In addition, it includes two indicators of labour market outcomes: the aggregate unemployment rate (UR) and the employment rate (EPR).

As explained in Box 6.A1.1, the first principal component is the linear combination of all variables (i.e. policies and outcomes indicators) which explains the highest proportion of the total variance of initial data. In this particular case, the first principal component accounts for 39.3% of the variance (see Table 6.A1.1). The second principal component is the linear combination of all variables that explains the highest proportion of the variance

* More precisely, this includes: active labour market programmes (ALMP expenditure per unemployed persons as a percentage of GDP per capita), union co-ordination (COOR), union coverage (COV), employment protection legislation (EPL), product market regulation (PMR), tax wedge (TW) and unemployment benefits (UB average gross replacement rate over a five-year period). These variables were available for 24 OECD countries and data were first standardised since the variances and/or measurement units differ much between variables.

Box 6.A1.1. Principal component analysis: methodological issue

Let us consider a standardised dataset of n observations and p variables, represented by a (n, p) matrix X .¹ In the space defined by the p variables, the corresponding scatter-plot cannot be visualised, but it is still possible to find a line that comes as close to the n observation-points as possible and thus captures most of the variability in the data. Let u_1 denote the unit vector $(p, 1)$ associated with this line. The co-ordinates of the n observation-points on the regression line thus correspond to the n components of the vector Xu_1 . According to the “least squares criterion”, the best fitting line through the data minimises the residual variability in the data, or equivalently, maximises the explained variance. Therefore, u_1 is such as $(Xu_1)'Xu_1 = u_1'X'Xu_1$ is maximal and $u_1'u_1 = 1$. The (p, p) matrix $X'X$ is the covariance matrix of the p variables. It can be shown that u_1 is the eigenvector associated with the largest eigenvalue e_1 of this matrix.² The so-called first principal component has the same direction as this eigenvector and the explained variance is maximal on this component. However, there remains some variability around this line and the second principal component is defined to maximize this remaining variability,³ and so on. More precisely, the eigenvector associated with the second largest eigenvalue determines the direction of the second principal component, and so on.

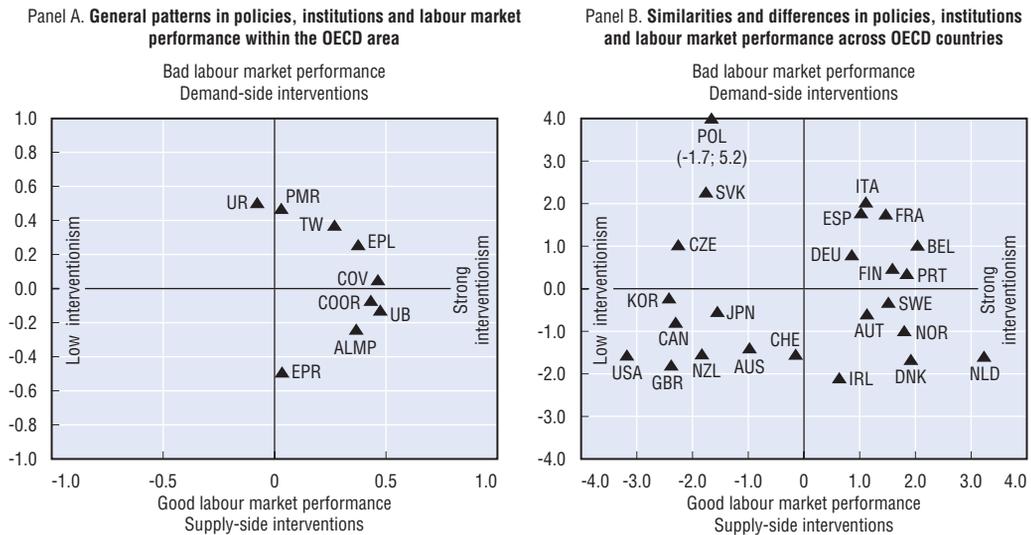
By construction, consecutive factors or components, denoted by $\psi_\alpha = Xu_\alpha$ are independent of each other – i.e. they are uncorrelated or orthogonal to each other – and satisfy the following relations: $\sum_{i=1 \dots n} \psi_{\alpha i} = 0$ and $\psi_\alpha' \psi_\alpha = e_\alpha$. Hence, the total variance on the principal component ψ_α equals e_α (the total variance in the data being equal to $\sum_\alpha e_\alpha$). Finally, the co-ordinate of an observation-point i on the so-called “principal axis” α is given by $\psi_{\alpha i} = \sum_{j=1 \dots p} u_{\alpha j} x_{ij}$ and illustrates the extent to which the corresponding observation contributes to the variance associated with that axis.

Considering now the scatter-plot associated with the p variable-points expressed in the space defined by the n observations, the same principle can be applied. The best fitting line through the data has the same direction as the $(n, 1)$ vector denoted by v_1 and such as $(X'v_1)'X'v_1 = v_1'XX'v_1$, where $v_1'v_1 = 1$. Hence, v_1 is the eigenvector associated with the largest eigenvalue of the (n, n) matrix XX' , and so on. It can be shown that the eigenvalues of the matrixes $X'X$ and XX' are the same and that $v_\alpha = e_\alpha^{-1/2}Xu_\alpha = e_\alpha^{-1/2}\psi_\alpha$. The co-ordinates of the p variable-points on the “principal axis” α correspond to the p components of the vector $X'v_\alpha = e_\alpha^{-1/2}X'\psi_\alpha$ and are given by: $\varphi_{\alpha j} = \sum_{i=1 \dots n} e_\alpha^{-1/2} \psi_{\alpha i} x_{ij}$. Therefore, each variable co-ordinate on a given principal axis equals the correlation coefficient between that variable and the corresponding principal component – these correlations are also called factor loadings. In turn, the interpretation of a principal component is closely related to those observable variables most contributing to it, i.e. most correlated with it or equivalently, with high factor loading.

1. When the variances and/or measurement units differ much between variables, data first have to be standardised (by subtracting mean and dividing by the standard error). Then, performing a PCA on a standardised data matrix has the same effect as performing the analysis on the correlation matrix since the covariance matrix from standardised data is equal to the correlation matrix of these data
2. Any square matrix A of rank n , admits n eigenvalues (e_i) and n eigenvectors (u_i) defined by: $Au_i = e_i u_i$, $u_i'u_i = 1$ and $u_i'u_j = 0$.
3. The corresponding $(p, 1)$ vector, denoted by u_2 , is such as $(Xu_2)'Xu_2 = u_2'X'Xu_2$ is maximal with $u_2'u_2 = 1$ and $u_2'u_1 = 0$.

which is not explained by the first principal component. It accounts for 34.1% of the total variance. Therefore, taken together, these two components capture most of the variability in the data (the two principal components together account for 73.4% of the total variance).

Figure 6.A1.1. **A synthetic picture of heterogeneity in the policy settings and performance of labour markets^{a, b}**



- a) The horizontal axis accounts for 39.3% of total variance of the data. The vertical axis accounts for 34.1% of total variance. Overall, these two Principal Components account for 73.4% of total variance.
- b) ALMP: active labour market programmes; COOR: union co-ordination; COV: union coverage; EPL: employment protection legislation; EPR: employment rate; PMR: product market regulation; TW: tax wedge; UB: unemployment benefits; UR: unemployment rate.

Source: OECD calculations using data from Bassanini and Duval (2006).

Statlink: <http://dx.doi.org/10.1787/323044064232>

Table 6.A1.1. **Explained variance**

Eigenvalues of the covariance matrix

Principal component:	Eigenvalues: variance on the extracted principal components	Eigenvalues expressed as a percentage of total variance	Cumulative variance extracted
First	3.54	39.3	39.3
Second	3.07	34.1	73.4
Third	0.58	6.4	79.9
Fourth	0.54	6.0	85.8
Fifth	0.47	5.3	91.1
Sixth	0.34	3.8	94.9
Seventh	0.22	2.5	97.4
Eighth	0.13	1.4	98.7
Ninth	0.11	1.3	100.0

Source: See Box 6.A1.1.

Statlink: <http://dx.doi.org/10.1787/246275145081>

The results, as shown in Panel A, suggest a straightforward interpretation of the two principal components:

- The horizontal axis in Panel A reports correlation coefficients between, on the one hand, policy and outcome variables, and the first principal component on the other. All policy variables (with the exception of PMR) are positively correlated with the first principal component. By contrast, there is no correlation between the two outcomes variables (EPR and UR) and the first principal component. This result is remarkable and suggests that the first principal component can be interpreted as an aggregate indicator of the degree of interventionism of labour market policies – with interventionism increasing from left

to right along the horizontal axis. The weakly negative correlation between PMR and the first principal component suggests that there is no simple cross-country association between PMR and the labour market institutions and policies included in this analysis.

- The vertical axis in Panel A reports the correlation coefficients between policy and outcome variables on the one hand, and the second principal component on the other. Interestingly, the correlation coefficient between the unemployment rate and the second principal component is strongly positive (and it is strongly negative in the case of the employment rate). This suggests that the second principal component provides an indicator of labour market performance. All policy variables range along the second axis between bipolar values of the coefficients for the two outcome variables. ALMP and UB – which predominantly act on the supply side of the labour market – turn out to be associated with good performance. By contrast, PMR, EPL and TW – policy planks acting mainly on the demand side – tend to be associated with bad performance.

This analysis suggests that: i) favourable employment outcomes can be associated with different degrees of policy interventionism; and ii) the mix between demand- and supply-side policies matters. This finding is consistent with econometric estimates discussed in Sub-section 2.2 of this chapter coming from Bassanini and Duval (2006).

Finally, Panel B locates countries within the space defined by both principal components. It suggests that countries can be grouped into four categories – based on: i) countries' degree of policy interventionism (as measured along the first principal component, *i.e.* the horizontal axis); and ii) employment performance as well as the mix between demand- and supply-side policies (as measured along the second principal component, *i.e.* the vertical axis). For each category, the higher the co-ordinates of a country on both axes, the more representative is this country of the corresponding regime of labour market functioning.