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# UNEMPLOYMENT IN THE OECD SINCE THE 1960s. WHAT DO WE KNOW?*

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This paper presents an empirical analysis of unemployment patterns in the OECD countries from the 1960s to the 1990s. Our results indicate the following. First, broad movements in unemployment across the OECD can be explained by shifts in labour market institutions. Second, interactions between average values of these institutions and shocks make no significant additional contribution to our understanding of OECD unemployment changes.

> Explanations (of high unemployment) based solely on institutions also run however into a major empirical problem: many of these institutions were already present when unemployment was low …. Thus, while labour market institutions can potentially explain cross country differences today, they do not appear able to explain the general evolution of unemployment over time.
> (Blanchard and Wolfers, 2000, p.C2)

> Despite conventional wisdom, high unemployment does not appear to be primarily the result of things like overly generous benefits, trade union power, taxes, or wage 'inflexibility'.
> (Oswald, 1997, p.1)

It is widely accepted that labour market rigidities are an important part of the explanation for the high levels of unemployment which are still to be found in many OECD countries. However, this view is not universally accepted and there remain serious problems as the above quotations indicate. One such problem, emphasised by Blanchard and Wolfers (2000), may be summarised as follows: labour market rigidities cannot explain why European unemployment is so much higher than US unemployment because the institutions generating these rigidities were much the same in the 1960s as they are today and in the 1960s, unemployment was much higher in the US than in Europe.

Before going any further, it is worth looking at the actual numbers reported in Table 1. This confirms that the US indeed had the highest unemployment in the OECD in the early 1960s but the picture today is not quite as clear-cut as is commonly thought. For example, at the time of writing, the majority of European countries have lower unemployment rates than the US. Nevertheless, the major

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Table 1

*Unemployment (Standardised Rate) %*

| | 1960–4 | 1965–72 | 1973–9 | 1980–7 | 1988–95 | 1996–9 | 2000–1 | 2002 |
|---|---|---|---|---|---|---|---|---|
| Australia | 2.5 | 1.9 | 4.6 | 7.7 | 8.7 | 7.8 | 6.5 | 6.3 |
| Austria | 1.6 | 1.4 | 1.4 | 3.1 | 3.6 | 4.3 | 3.7 | 4.3 |
| Belgium | 2.3 | 2.3 | 5.8 | 11.2 | 8.4 | 9.2 | 6.8 | 7.3 |
| Canada | 5.5 | 4.7 | 6.9 | 9.7 | 9.5 | 8.7 | 7.0 | 7.7 |
| Denmark | 2.2 | 1.7 | 4.1 | 7.0 | 8.1 | 5.3 | 4.4 | 4.5 |
| Finland | 1.4 | 2.4 | 4.1 | 5.1 | 9.9 | 12.2 | 9.4 | 9.1 |
| France | 1.5 | 2.3 | 4.3 | 8.9 | 10.5 | 11.9 | 8.9 | 8.7 |
| Germany (W) | 0.8 | 0.8 | 2.9 | 6.1 | 5.6 | 7.1 | 6.4 | 6.8 |
| Ireland | 5.1 | 5.3 | 7.3 | 13.8 | 14.7 | 8.9 | 4.0 | 4.4 |
| Italy | 3.5 | 4.2 | 4.5 | 6.7 | 8.1 | 9.9 | 8.4 | 7.4 |
| Japan | 1.4 | 1.3 | 1.8 | 2.5 | 2.5 | 3.9 | 4.9 | 5.4 |
| Netherlands | 0.9 | 1.7 | 4.7 | 10.0 | 7.2 | 4.7 | 2.6 | 2.8 |
| Norway | 2.2 | 1.7 | 1.8 | 2.4 | 5.2 | 3.9 | 3.6 | 3.9 |
| New Zealand | 0.0 | 0.3 | 0.7 | 4.7 | 8.1 | 6.8 | 5.7 | 5.2 |
| Portugal | 2.3 | 2.5 | 5.5 | 7.8 | 5.4 | 5.9 | 4.1 | 5.1 |
| Spain | 2.4 | 2.7 | 4.9 | 17.6 | 19.6 | 19.4 | 13.5 | – |
| Spain* | | | | | | 15.8 | 11.0 | 11.4 |
| Sweden | 1.2 | 1.6 | 1.6 | 2.3 | 5.1 | 8.7 | 5.3 | 4.9 |
| Switzerland | 0.2 | 0.0 | 0.8 | 1.8 | 2.8 | 3.7 | 2.6 | 2.6 |
| UK | 2.6 | 3.1 | 4.8 | 10.5 | 8.8 | 6.9 | 5.2 | 5.1 |
| USA | 5.5 | 4.3 | 6.4 | 7.6 | 6.1 | 4.8 | 4.4 | 5.8 |

*Notes:*
As far as possible, these numbers correspond to the OECD standardised rates and conform to the ILO definition. The exception here is Italy where we use the US Bureau of Labor Statistics 'unemployment rates on US concepts'. In particular we use the correction to the OECD standardised rates made by the Bureau prior to 1993. This generates a rate which is 1.6 percentage points below the OECD standardised rate after 1993. The rates referred to in Spain* refer to recently revised ILO rates. For earlier years we use the data reported in Layard *et al.* (1991) Table A3). For later years we use *OECD Employment Outlook* (2003) and *UK Employment Trends*, published by the UK Department of Education and Employment.

countries of Continental Europe still have relatively high unemployment and no European countries have reached the extraordinarily low levels of unemployment ruling in the early 1960s. The wide variations in unemployment across European countries is a very important fact because any explanation of 'high unemployment in Europe' is not of great value if it cannot explain the low levels of unemployment in the majority of European countries.[1]

Our purpose in what follows is to shed some further light on the patterns of unemployment seen in the OECD from the 1960s to the 1990s. In particular, we want to focus on the problem noted above and, more generally, on the challenges set out in our introductory quotes. Our aim is to see how far it is possible to defend the proposition that the dramatic long-term shifts in unemployment seen in the OECD countries over the period from the 1960s to the 1990s can be explained simply by changes in labour market institutions in the same period. The institu-

[1] A commonplace reaction to this fact is to argue that the numbers are misleading because, in many countries, some 'unemployed' people are hidden in other categories (e.g. disability, early retirement, subsidised employment, prison). In fact, this applies in all countries but in the absence of any serious discussion of the relevant numbers in all the countries, this argument cannot carry much weight. Furthermore, a good number of European countries also have *employment* rates which are comparable to that in the US (e.g. Denmark, Netherlands, Norway, Sweden, Switzerland, UK).

tions concerned will be the usual suspects set out in the Oswald (1997) quotation, namely generous benefits, trade union power, taxes and wage 'inflexibility'.

The alternative hypothesis is that unemployment patterns cannot be explained in this way but can be explained by the interaction between relatively stable institutions and 'shocks', these latter being exogenous shifts in the macroeconomic environment. The idea here is that the shocks drive unemployment but the scale of the unemployment consequences of any particular shock depend on the institutional structure of the economy. This is certainly a plausible hypothesis, although to explain secular shifts in unemployment over 30-year periods, the 'shocks' will certainly have to last for a long time. In what follows, we make some attempt to discriminate between this alternative hypothesis and the basic notion that secular shifts in unemployment are caused by secular shifts in institutions.

The remainder of the paper is set out as follows. In the next Section we look at the various institutions and discuss our data. In Section 2 we lay out our empirical strategy and in Section 3 we present our results. We finish with a summary and conclusions.

## 1. Factors Influencing Unemployment in the OECD, 1960s–1990s

There are innumerable detailed theories of unemployment in the long run. These may be divided into two broad groups, those based on flow models and those based on stock models. Pissarides (2000) and Mortensen and Pissarides (1999) provide good surveys of the former model type. Blanchard and Katz (1997) presents a general template for the latter models. Fundamentally, all the models have the same broad implications. First, unemployment in the short run and in the long run must be consistent with the level of real demand. Second, over the long term, real demand and unemployment generally tend towards the level consistent with stable inflation. This we term the equilibrium level. Various possible mechanisms may be at work here. For example, most OECD countries now set monetary policy on the basis of an inflation target which naturally moves real demand and unemployment towards the equilibrium defined above. Third, the equilibrium level of unemployment is affected first, by any factor which influences the ease with which unemployed individuals can be matched to available job vacancies, and second, by any factor which tends to raise wages in a direct fashion despite excess supply in the labour market. These factors often take the form of labour market institutions.

Our purpose in what follows is to investigate the effect of changes in labour market 'institutions' on the equilibrium unemployment in the OECD from the 1960s to the 1990s. In order to undertake this task, we require long time series for the appropriate countries. In this Section, we describe the information we possess and also indicate the gaps in our knowledge. The variables we consider relate, in turn, to the benefit system, the system of wage determination, employment protection, labour taxes and barriers to labour mobility.

### 1.1. *The Unemployment Benefit System*

There are four aspects of the unemployment benefit system for which there are good theoretical and empirical reasons to believe that they will influence

equilibrium unemployment. These are, in turn, the level of benefits,[2] the duration of entitlement,[3] the coverage of the system[4] and the strictness with which the system is operated.[5] Of these, only the first two are available as time series for the OECD countries. The OECD has collected systematic data on the unemployment benefit replacement ratio for three different family types (single, with dependent spouse, with spouse at work) in three different duration categories (1st year, 2nd and 3rd years, 4th and 5th years) from 1961 to 1995 (every other year).[6] From this we derive a measure of the benefit replacement ratio, equal to the average over family types in the 1st year duration category and an index of benefit duration equal to [0.6(2nd and 3rd year replacement ratio) + 0.4(4th and 5th year replacement ratio)] ÷ (1st year replacement ratio). So our measure of benefit duration is the level of benefit in the later years of the spell normalised on the benefit in the first year of the spell. A summary of these data is presented in Table 2. Note that the product of these two variables gives the average replacement ratio from the 2nd to the 5th year of an unemployment spell.

The key feature of these data is that in nearly all countries, benefit replacement ratios have tended to become more generous from the 1960s to the early 1980s, the exceptions being Germany, Japan and New Zealand. Italy had no effective benefit system over this period for the vast majority of the unemployed. After the early 1980s, countries moved in different directions. Italy introduced a benefit system and those in Finland, Portugal and Switzerland became markedly more generous. By contrast, benefit replacement ratios in Belgium, Ireland and the UK have fallen steadily since the early 1980s.

It is unfortunate that we have no comprehensive time series data on the coverage of the system or on the strictness with which it is administered. This is particularly true in the case of the latter because the evidence we possess appears to indicate that this is of crucial importance in determining the extent to which a generous level of benefit will actually influence unemployment. For example, Denmark, which has very generous unemployment benefits (see Table 2), totally reformed the operation of its benefit system through the 1990s with a view to tightening the criteria for benefit receipt and the enforcement of these criteria via a comprehensive system of sanctions. The Danish Ministry of Labour is convinced

[2] A good general reference is Holmlund (1998). A useful survey of micro studies can be found in OECD (1994) Ch. 8). Micro evidence from policy changes is contained in Carling *et al.* (1999), Hunt (1995) and Harkman (1997), and from experiments in Meyer (1995). Cross-country macro evidence is available in Nickell and Layard (1999), Scarpetta (1996) and Elmeskov *et al.* (1998). The average of their results indicates a 1.11 percentage point rise in equilibrium unemployment for every 10 percentage point rise in the benefit replacement ratio.

[3] There is fairly clear micro evidence that shorter benefit entitlement leads to shorter unemployment duration; see Ham and Rea (1987), Katz and Meyer (1990) and Carling *et al.* (1996).

[4] Variations in the coverage of unemployment benefits are large, see OECD (1994, Table 8.4), and there is a strong positive correlation between coverage and the level of benefit (OECD, 1994, p.190). Bover *et al.* (1998) present strong evidence for Spain and Portugal that the covered exit unemployment more slowly than the uncovered.

[5] There is strong evidence that the strictness with which the benefit system is operated, at given levels of benefit, is a very important determinant of unemployment duration. Micro evidence for the Netherlands may be found in Abbring *et al.* (1999) and Van Den Berg *et al.* (1999). Cross country evidence is available in the Danish Ministry of Finance (1999, Ch. 2) and in OECD (2000, Ch. 4).

[6] See OECD (1994, Table 8.1) for the 1991 data.

Table 2

*Unemployment Benefits, Availability Conditions and Active Labour Market Policies*

| | Unemployment Benefits | | | | | | Strictness of Benefit Conditions‡ | Expenditure on Active Policies§ (% GDP) | |
|---|---|---|---|---|---|---|---|---|---|
| | Replacement Ratio* | | | Duration Index† | | | | | |
| | 1960–4 | 1980–7 | 1999 | 1960–4 | 1980–7 | 1999 | 1995 | 1985 | 1998 |
| Australia | 0.18 | 0.23 | 0.25 | 1.02 | 1.02 | 1.00 | 3.6 | 0.42 | 0.42 |
| Austria | 0.15 | 0.34 | 0.42 | 0 | 0.75 | 0.68 | 2.3 | 0.27 | 0.44 |
| Belgium | 0.37 | 0.50 | 0.46 | 1.0 | 0.79 | 0.78 | 3.1 | 1.31 | 1.42 |
| Canada | 0.39 | 0.57 | 0.49 | 0.33 | 0.25 | 0.42 | 2.8 | 0.64 | 0.50 |
| Denmark | 0.25 | 0.67 | 0.66 | 0.63 | 0.62 | 1.00 | 3.0 | 1.14 | 1.66 |
| Finland | 0.13 | 0.38 | 0.54 | 0 | 0.61 | 0.63 | 2.7 | 0.90 | 1.40 |
| France | 0.48 | 0.61 | 0.59 | 0.28 | 0.37 | 0.47 | 2.7 | 0.66 | 1.30 |
| Germany (W) | 0.43 | 0.38 | 0.37 | 0.57 | 0.61 | 0.75 | 2.6 | 0.80 | 1.26 |
| Ireland | 0.21 | 0.50 | 0.35 | 0.68 | 0.40 | 0.77 | 1.7 | 1.52 | 1.54 |
| Italy | 0.09 | 0.02 | 0.60‖ | 0 | 0 | 0 | – | – | 1.12 |
| Japan | 0.36 | 0.29 | 0.37 | 0 | 0 | 0 | – | 0.17 | 0.09 |
| Netherlands | 0.39 | 0.67 | 0.70 | 0.12 | 0.66 | 0.64 | 3.7 | 1.16 | 1.74 |
| Norway | 0.12 | 0.56 | 0.62 | 0 | 0.49 | 0.60 | 3.3 | 0.61 | 0.90 |
| New Zealand | 0.37 | 0.30 | 0.30 | 1.02 | 1.04 | 1.00 | 2.7 | 0.90 | 0.63 |
| Portugal | – | 0.44 | 0.65 | – | 0.11 | 0.58 | 2.8 | 0.33 | 0.78 |
| Spain | 0.35 | 0.75 | 0.63 | 0 | 0.21 | 0.29 | – | 0.33 | 0.70 |
| Sweden | 0.11 | 0.70 | 0.74 | 0 | 0.05 | 0.02 | 3.7 | 2.10 | 1.97 |
| Switzerland | 0.04 | 0.48 | 0.74 | 0 | 0 | 0.31 | – | 0.19 | 0.77 |
| UK | 0.27 | 0.26 | 0.17 | 0.87 | 0.71 | 0.96 | 2.6 | 0.75 | 0.34 |
| US | 0.22 | 0.30 | 0.29 | 0.12 | 0.17 | 0.22 | 3.3 | 0.25 | 0.17 |

*Notes:*

*Source: OECD. Based on the replacement ratio in the first year of an unemployment spell averaged over three family types. See OECD (1994, Table 8.1) for an example.

†Source, OECD. Based on [0.6 (replacement rate in 2nd and 3rd year of a spell) + 0.4 (replacement rate in 4th and 5th year of a spell] ÷ (replacement rate in 1st year of a spell).

‡Source, Danish Ministry of Finance (1999, Figure 2.4d). This is an index of the strictness of the conditions governing the availability of unemployment benefits. The number for Denmark refers to 1998. In the early 1990s, the corresponding number was 2.3.

§Source, OECD (2001, Table 1.5).

‖This number refers to the 'mobility' benefit, paid to those who become unemployed as a result of a collective layoff. Most Italian unemployed do not fall within this category.

that this process has played a major role in allowing Danish unemployment to fall dramatically since the early 1990s without generating inflationary pressure (Danish Ministry of Finance, 1999, Ch.2). Just to see some of the ways in which systems of administration vary across country, in Table 2 we present indices of the strictness of the work availability conditions in various countries. These are based on eight sub-indicators referring to the rules relating to the types of jobs that unemployed individuals must accept or incur some financial or other penalty. We can see that countries with notably lax systems in the mid-1990s include Austria, Finland, France, Germany, Ireland and the UK, although Ireland and the UK have significantly tightened their benefit operations since that time.

A further aspect of the structure of the benefit system for which we do not have detailed data back to the 1960s are those policies grouped under the heading of active labour market policies (ALMP). We do, however, have data from 1985 which we present in Table 2. The purpose of ALMPs is to provide active assistance to the

unemployed which will improve their chances of obtaining work. Multi-country studies basically using cross section information indicate that ALMPs do have a negative impact on unemployment (Scarpetta, 1996; Nickell, 1997; Elmeskov *et al.*, 1998). This broad brush evidence is backed up by numbers of microeconometric studies[7] which show that under some circumstances, active labour market policies are effective. In particular, job search assistance tends to have consistently positive outcomes but other types of measure such as employment subsidies and labour market training must be well designed if they are to have a significant impact. See Martin (2000) for a detailed analysis.

Turning to the numbers, we see that, by and large, the countries of Northern Europe and Scandinavia devote most resources to ALMPs. It might be hypothesised that they do this because high expenditure on ALMPs is required to offset their rather generous unemployment benefit systems and to push unemployed individuals into work. Such additional pressure on the unemployed is not required if benefits are very low relative to potential earnings in work.

### 1.2. *Systems of Wage Determination*

In most countries in the OECD, the majority of workers have their wages set by collective bargaining between employers and trade unions at the plant, firm, industry or aggregate level. This is important for our purposes because there is some evidence that trade union power in wage setting has a significant impact on unemployment.[8] Unfortunately, we do not have complete data on collective bargaining coverage (the proportion of employees covered by collective agreements) but the data presented in Table 3 give a reasonable picture. Across most of Continental Europe, including Scandinavia but excluding Switzerland, coverage is both high and stable. As we shall see, this is either because most people belong to trade unions or because union agreements are extended by law to cover non-members in the same sector. In Switzerland and in the OECD countries outside Continental Europe and Scandinavia, coverage is generally much lower with the exception of Australia. In the UK, the US and New Zealand, coverage has declined with the fall in union density, there being no extension laws.

In Table 3, we also present the percentage of employees who are union members. Across most of Scandinavia, membership tends to be high. By contrast, in much of Continental Europe and in Australia, union density tends to be less than 50% and is gradually declining. In these countries there is, consequently, a wide and widening gap between density and coverage which it is the job of the extension laws to fill. This situation is at its most stark in France, which has the lowest union density in the OECD at around 10%, but one of the highest levels of coverage (around 95%). Outside these regions, both density and coverage tend to be relatively low and both are declining at greater or lesser rates. The absence of complete coverage data means that we have to rely on the density variable to

[7] See Katz (1998), Martin (2000) or Martin and Grubb (2001) for useful surveys.

[8] See the discussion in Nickell and Layard (1999), Section 8 and Booth *et al.* (2000) (particularly around Table 6.2) for positive evidence.

Table 3

*Wage Determination Structures*

| | Collective Bargaining Coverage (%)* | | | Union Density (%)† | | | Extension Laws‡ | Co–ordination (Index, range 1–3)§ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1960–4 | | 1980–7 | | 1995–9 |
| | 60 | 80 | 94 | 60–64 | 80–87 | 96–98 | 1993 | 1 | 2 | 1 | 2 | 2 |
| Australia | 85 | 85 | 80 | 48 | 49 | 35 | ✔ | 2.3 | 2 | 2.3 | 2.3 | 1.5 |
| Austria | – | – | 99 | 59 | 51 | 39 | ✔ | 3 | 2.5 | 3 | 2.5 | 2 |
| Belgium | 80 | 90 | 90 | 40 | 52 | 52 | ✔ | 2 | 2 | 2 | 2.6 | 2 |
| Canada | 35 | 40 | 36 | 27 | 37 | 36 | × | 1 | 1 | 1 | 1.1 | 1 |
| Denmark | 67 | 72 | 69 | 60 | 79 | 76 | × | 2.5 | 3 | 2.4 | 2.5 | 2 |
| Finland | 95 | 95 | 95 | 35 | 69 | 80 | ✔ | 2.8 | 1.5 | 2.8 | 2 | 2.5 |
| France | – | 85 | 95 | 20 | 16 | 10 | ✔ | 1.8 | 2 | 1.8 | 2 | 1.5 |
| Germany (W) | 90 | 91 | 92 | 34 | 34 | 27 | ✔ | 3 | 2.5 | 3 | 2.5 | 2.5 |
| Ireland | – | – | – | 47 | 56 | 43 | × | 2 | 2 | 2 | 2.1 | 3 |
| Italy | 91 | 85 | 82 | 25 | 45 | 37 | ✔ | 1.5 | 1.9 | 1.5 | 1.8 | 2.5 |
| Japan | – | 28 | 21 | 33 | 27 | 22 | × | 3 | 2.5 | 3 | 2.5 | 2.5 |
| Netherlands | 100 | 76 | 85 | 41 | 30 | 24 | ✔ | 2 | 3 | 2 | 2.4 | 3 |
| Norway | 65 | 70 | 70 | 52 | 55 | 55 | × | 2.5 | 3 | 2.5 | 2.7 | 2 |
| New Zealand | – | – | 31 | 36 | 37 | 21 | × | 1.5 | 2.5 | 1.3 | 2.3 | 1 |
| Portugal | – | 70 | 71 | 61 | 57 | 25 | ✔ | 1.8 | 3 | 1.8 | 1.6 | 2 |
| Spain | – | 68 | 78 | 9 | 11 | 18 | ✔ | 2 | 3 | 2 | 2.3 | 2 |
| Sweden | – | – | 89 | 64 | 83 | 87 | × | 2.5 | 3 | 2.4 | 2.5 | 2 |
| Switzerland | – | – | 53 | 35 | 29 | 23 | ✔ | 2.3 | 2 | 2.3 | 2 | 1.5 |
| UK | 67 | 70 | 40 | 44 | 53 | 35 | × | 1.5 | 1.6 | 1.4 | 1.1 | 1 |
| US | 29 | 21 | 17 | 27 | 20 | 14 | × | 1 | 1 | 1 | 1 | 1 |

*Notes:*

*Source: Ochel (2000*a*). Refers to the percentage of the employed labour force whose pay is determined by collective agreement.

†Source: see Data Appendix. Refers to union members as a percentage of employees.

‡Source: OECD (1994), Table 5.11. Tick implies bargained wages are extended to non-union firms at the behest of one party to the bargain. In Switzerland, both parties to the bargain must agree on extension.

§The first series (1) only moves in response to major changes in the extent of co-ordination in wage bargaining. The second series (2) attempts to capture all the nuances. Co-ordination 1 was provided by Michele Belot, see Belot and Van Ours (2000) for details. Co-ordination 2 may be found in Ochel (2000*b*).

capture the impact of unionisation on unemployment. As should be clear, this is only half the story, so we must treat any results we find in this area with some caution.

The other aspect of wage bargaining which appears to have a significant impact on wages and unemployment is the extent to which bargaining is co-ordinated.[9,10] Roughly speaking, the evidence suggests that if bargaining is

[9] See the discussion in Nickell and Layard (1999), Section 8, Booth *et al.* (2000) (particularly around Table 6.1) and OECD (1997, Chapter 3).

[10] One aspect of wage determination which we do not analyse in this paper is minimum wages. This is for two reasons. First, the balance of the evidence suggests that minimum wages are generally low enough not to have much of an impact on employment except for young people. Second, only around half the OECD countries had statutory minimum wages over the period 1960–95. Of course, trade unions may enforce 'minimum wages' but this is only a minor part of their activities. And these are already accounted for in our analysis of density, coverage and co-ordination.

highly co-ordinated, this will offset the adverse effects of unionism on employment (see Nickell and Layard, 1999, for example). Co-ordination refers to mechanisms whereby the aggregate employment implications of wage determination are taken into account when wage bargains are struck. This may be achieved if wage bargaining is highly centralised, as in Austria, or if there are institutions, such as employers' federations, which can assist bargainers to act in concert even when bargaining itself ostensibly occurs at the level of the firm or industry, as in Germany or Japan (Soskice, 1991). It is worth noting that co-ordination is not, therefore, the same as centralisation which refers simply to the level at which bargaining takes place (plant, firm, industry or economy-wide). In Table 3, we present co-ordination indices for the OECD from the 1960s. The first index (*co-ord* 1) basically ignores transient changes whereas the second (*co-ord* 2) tries to capture the various detailed nuances of the variations in the institutional structure. Notable changes are the increases in co-ordination in Ireland and the Netherlands towards the end of the period and the declines in co-ordination in Australia, New Zealand and Sweden. Co-ordination also declines in the UK over the same period but this simply reflects the sharp decline of unionism overall.

### 1.3. *Employment Protection*

Employment protection laws are thought by many to be a key factor in generating labour market inflexibility. Despite this, evidence that they have a decisive impact on overall rates of unemployment is mixed, at best.[11] In Table 4, we present details of an employment protection index for the OECD countries. General features to note are the wide variation in the index across countries and the fact that, in some countries, the basic legislation was not introduced until the 1970s. The countries of Continental Europe tend to have the most strict regulations but even here there remains substantial variation. Notable changes include the relaxation of the laws in Spain and Italy since the 1980s, although they remain comparatively strict. The most significant change has been that instituted in Denmark, where employment protection has been reduced to such an extent that it now joins Switzerland as a Continental European country with an employment protection system which is as weak as that in a typical 'Anglo-Saxon' country.

### 1.4. *Labour Taxes*

The important taxes here are those that form part of the wedge between the real product wage (labour costs per employee normalised on the output price) and the real consumption wage (after tax pay normalised on the consumer price index). These are payroll taxes, income taxes and consumption taxes. Their combined

[11] The results presented by Lazear (1990), Addison and Grosso (1996), Bentolila and Bertola (1990), Elmeskov *et al.* (1998), Nickell and Layard (1999) do not add up to anything very decisive although there is a clear positive relationship between employment protection and long-term unemployment.

Table 4

*Employment Protection, Labour Taxes and Owner Occupation*

| | Employment Protection Index (range: 0–2)* | | | Total Labour Tax Rate (%)† | | | Owner Occupation Rate (%)‡ | | |
|---|---|---|---|---|---|---|---|---|---|
| | 60–64 | 80–87 | 98 | 60–64 | 80–87 | 96–00 | 60–64 | 80–87 | 88–95 |
| Australia | 0.50 | 0.50 | 0.50 | 28 | 39 | – | 64 | 71 | 70 |
| Austria | 0.65 | 1.27 | 1.10 | 47 | 58 | 66 | 39 | 50 | 55 |
| Belgium | 0.72 | 1.55 | 1.00 | 38 | 46 | 51 | 51 | 60 | 62 |
| Canada | 0.30 | 0.30 | 0.30 | 31 | 42 | 53 | 65 | 62 | 61 |
| Denmark | 0.90 | 1.10 | 0.70 | 32 | 59 | 61 | 44 | 52 | 51 |
| Finland | 1.20 | 1.20 | 1.00 | 38 | 58 | 62 | 57 | 63 | 67 |
| France | 0.37 | 1.30 | 1.40 | 55 | 65 | 68 | 42 | 52 | 54 |
| Germany (W) | 0.45 | 1.65 | 1.30 | 43 | 50 | 50 | 30 | 39 | 38 |
| Ireland | 0.02 | 0.50 | 0.50 | 23 | 37 | 33 | 62 | 77 | 78 |
| Italy | 1.92 | 2 | 1.50 | 57 | 56 | 64 | 46 | 62 | 67 |
| Japan | 1.40 | 1.40 | 1.40 | 25 | 33 | 37 | 69 | 62 | 61 |
| Netherlands | 1.35 | 1.35 | 1.10 | 45 | 55 | 43 | 30 | 43 | 44 |
| Norway | 1.55 | 1.55 | 1.30 | – | 65 | 60 | 53 | 59 | 59 |
| New Zealand | 0.80 | 0.80 | 0.80 | – | 30 | – | 69 | 70 | 71 |
| Portugal | 0 | 1.94 | 1.70 | 20 | 33 | 39 | – | – | – |
| Spain | 2 | 1.91 | 1.40 | 19 | 40 | 45 | 54 | 75 | 78 |
| Sweden | 0 | 1.80 | 1.10 | 41 | 77 | 77 | 36 | 41 | 42 |
| Switzerland | 0.55 | 0.55 | 0.55 | 30 | 36 | 36 | 33 | 30 | 30 |
| UK | 0.16 | 0.35 | 0.35 | 34 | 51 | 44 | 43 | 60 | 68 |
| US | 0.10 | 0.10 | 0.10 | 34 | 44 | 45 | 64 | 67 | 64 |

*Notes:*

*These data are an index of the strictness of employment protection legislation. They are based on an interpolation of the variable used in Blanchard and Wolfers (2000). This was based on the series used in Lazear (1990) and that provided by the OECD for the late 1980s and 1990s. The 1998 number is taken from Nicoletti *et al.* (2000), Table A3. 11 (1st col. rescaled).

†This is the sum of the payroll tax rate, the income tax rate and the consumption tax rate. For further details, see the Data Appendix.

‡These data refer to the proportion of households who are owner-occupiers. The data were supplied by Andrew Oswald. For most countries, the original data are generated by the Population Census and then linearly interpolated.

impact on unemployment remains a subject of some debate despite the large number of empirical investigations. Indeed some studies indicate that employment taxes have no long run impact on unemployment whatever whereas others present results which imply that they can explain more or less all the rise in unemployment in most countries during the 1960–85 period.[12] In Table 4 we present the total tax rate on labour for the OECD countries. All countries exhibit a substantial increase over the period from the 1960s to the 1990s although there are wide variations across countries. These mainly reflect the extent to which health, higher education and pensions are publicly provided along with the all-round generosity of the social security system. Some countries have made significant attempts to reduce labour taxes in recent years, notably the Netherlands and the UK.

[12] A good example of a study in this latter group is Daveri and Tabellini (2000) whereas one in the former group is OECD (1990) Annex 6). Extensive discussions may be found in Nickell and Layard (1999), Section 6, Disney (2000) and Pissarides (1998).

1.5. *Barriers to Labour Mobility*

Oswald (1997) proposes that barriers to geographical mobility, as reflected in the rate of owner occupation of the housing stock, play a key role in determining unemployment. He finds that changes in unemployment are positively correlated with changes in owner occupation rates across countries, US states and UK regions. He also presents UK evidence that owner occupation represents a significant mobility barrier relative to private renting. However, Gregg *et al.* (2000) find that while private renting is significantly negatively related to unemployment both across UK regions and across time in a regional fixed effects model, this relationship becomes significantly positive once other relevant regional characteristics are included. We propose to include owner occupation as a variable in our investigation and the data are shown in Table 4. It must, however, be born in mind that these data are heavily interpolated, so the results should be treated with caution.

## 2. The Basic Empirical Strategy

Our aim is to explain the different patterns of unemployment exhibited across the OECD in the period from the 1960s to the 1990s. Our approach, first, is to see how far we can get with a very simple empirical model based on changes in institutions and second, to compare this model with that focussed on the interaction between shocks and institutions. We have already discussed those factors which can be expected to influence equilibrium unemployment in the long run. Then, since we are, in practice, going to explain actual unemployment, we must also include in our model those factors which might explain the short-run deviations of unemployment from its equilibrium level. Following the discussion in Hoon and Phelps (1992) or Phelps (1994) these factors include aggregate demand shocks, productivity shocks and wage shocks. More specifically, we include the following (see Data Appendix for details):

(*i*) money supply shocks, specifically changes in the rate of growth of the nominal money stock (i.e. the second difference of the log money supply);
(*ii*) productivity shocks, measured by *changes* in TFP growth or deviations of TFP growth from trend;
(*iii*) labour demand shocks, measured by the residuals from a simple labour demand model;[13]
(*iv*) real import price shocks, measured by proportional changes in real import prices weighted by the trade share;
(*v*) the (ex-post) real interest rate.

[13] The series consists of the residuals $\hat{\varepsilon}_t$ of the following regression estimated for each of the 20 countries separately:

$$\ln ET_t = \beta_0 + \beta_1 \ln ET_{t-1} + \beta_2 \ln ET_{t-2} + \beta_3 \ln ET_{t-3} + \beta_4 \ln YQ_t + \beta_5 \ln WTP_t + \varepsilon_t$$

$ET$ = total employment, $YQ$ = real GDP, $WTP$ = real labour cost per employee. Including $\hat{\varepsilon}_t$ in the unemployment regression will control for short-run employment shocks. Given the number of lags in the equation, $\hat{\varepsilon}_t$ will typically be serially uncorrelated.

With the exception of the real interest rate, these variables are genuine 'shocks' in the sense that they are typically stationary and tend to revert to their mean quite rapidly. Nevertheless, their impact may persist for some time, since we shall also include the lagged dependent variable in our model to capture endogenous persistence.

Some further specific points are worth noting. The first of these is the role played by residuals from a labour demand equation for each country. The idea here is to capture aggregate labour demand shocks. Second, productivity shocks and real import shocks are included to capture the effects of real wage resistance. Increases in real import prices or falls in trend productivity growth will lead to temporary increases in unemployment if real consumption wages do not adjust appropriately; see Grubb *et al.* (1983) or, more recently, Ball and Moffitt (2001). Third, we include the real interest rate because some have accorded it a significant role in the determination of unemployment even in the long run (Phelps, 1994; Blanchard and Wolfers, 2000).

### 2.1. *Related Literature*

Before going on to present our results, it is helpful to look at some of the other work which attempts to explain the time series patterns of OECD unemployment since the 1960s. There are several different approaches that have been used. First there is a basic division between studies that use econometric techniques to fit the data and those which use calibrated models which typically distinguish between a stylised 'European' economy and a stylised 'US' economy. Second there is another division between those which focus on changes in the institutions and those which consider 'shocks' or baseline factors which shift over time and are typically interacted with average levels of institutional factors.

Looking first at panel data econometric models which interact stable institutions with shocks or baseline variables, good examples include Layard *et al.* (1991, Ch. 9 pp. 430–7), Blanchard and Wolfers (2000), Bertola *et al.* (2001) and Fitoussi *et al.* (2000). All these focus on the time series variation in the data by including country dummies.[14] Layard *et al.* (1991) present a dynamic model of unemployment based on annual data where the baseline variables include wage pressure (a dummy which takes the value one from 1970), the benefit replacement ratio, real import price changes and monetary shocks. Their impact on unemployment differs across countries, since it depends on time invariant institutions, with different sets of institutions affecting the degree of unemployment persistence, the impact of wage pressure variables including the replacement rate and import prices, and the effect of monetary shocks. The model explains the data better than individual country autoregressions with trends.

Blanchard and Wolfers (2000) use five-year averages to concentrate on long-run effects. The shocks or baseline variables consist of the level of TFP growth, the real

[14] This distinguishes these studies from those which focus on the cross-country variation in the data by using cross-sections or random effects panel data models (Scarpetta, 1996; Nickell, 1997; Elmeskov *et al.*, 1998).

interest rate, the change in inflation and labour demand shifts (essentially the log of labour's share purged of the impact of factor prices). With the exception of the change in inflation, these 'shocks' are not mean reverting which is why we prefer the term baseline variables. These variables are driving unemployment, so that, for example, the fact that annual TFP growth is considerably higher in the 1960s than in the 1990s in most countries is an important reason why unemployment is typically higher in the latter period. Quite why this should be so is not wholly clear. Many mechanisms are discussed in Saint-Paul (1991) but there is no evidence that they are important or robust in Bean and Pissarides (1993) for example. Nevertheless, interacting these observed baseline variables with time invariant institutional variables fits the data well. In an alternative investigation, Blanchard and Wolfers replace the observed shock variables with unobserved common shocks represented by time dummies. When these are interacted with time invariant institutions, the explanatory power of the model increases substantially.

The basic Blanchard and Wolfers model is extended in Bertola *et al.* (2001) who include an additional baseline variable, namely the share of young people (age 15–24) in the population over 15 years old. The model explains a substantial proportion of the divergence between US and other countries unemployment rates (48 to 63%) over the period 1970 to 1995, although an even higher proportion is explained when the observed baseline variables are replaced by time dummies.

Fitoussi *et al.* (2000) proceed in a slightly different way. First they interact the baseline variables with country dummies and then investigate the cross-section relationship between these and labour market institutions. The baseline variables include non-wage support (income from private wealth plus social spending) relative to labour productivity and the real price of oil as well as two in common with Blanchard and Wolfers (2000), namely the real rate of interest and productivity growth.[15] In all these four papers, the explanation of long-run changes in unemployment has the same structure. The changes depend on long-run shifts in a set of baseline variables, with the impact of these being much bigger and longer-lasting in some countries than others because of stable institutional differences. The persuasiveness of these explanations depends on whether the stories associated with the baseline variables are convincing. For example, the notion that a fall in trend productivity growth, a rise in the real price of oil or a downward shift in the labour demand curve leads to a *permanent* rise in equilibrium unemployment is one which many might find unappealing.

An interesting alternative, still in the context of the institutions/shocks framework is the calibration analysis discussed in Ljungqvist and Sargent (1998). The idea here is that in 'Europe', benefits are high with a long duration of eligibility whereas in the 'US', benefits are modest and of fixed duration. In a world where turbulence is low, the probability of large skill losses among the unemployed is low and the difference in the unemployment rates in 'Europe' and the 'US' is min-

[15] In fact they differ a little because in the Fitoussi *et al.* (2000) paper, the real rate of interest is a world average and productivity growth refers to labour productivity.

imal, because the chances of an unemployed person in 'Europe' finding a job with wages exceeding the benefit level are high. In a world where turbulence is high, the probability of large skill losses among the unemployed is high. As a consequence the high level of benefits relative to past earnings and hence the high reservation wage in 'Europe' now bites and unemployment is much higher than in the 'US'. So we have a situation where the relevant institution, namely the benefit system, remains stable but the consequences are very different in a world of high turbulence from those in a world of low turbulence.

While this model captures a particular feature of the situation, in order for it to be a persuasive explanation of recent history it must pass two tests. First, we need evidence that turbulence has indeed increased and second it must explain why many countries in Europe now have relatively low unemployment. Indeed the variation in unemployment (and employment) rates across European countries is far larger than the difference between Europe and the US. To justify the assumption of increasing turbulence, Ljungqvist and Sargent point to the increasing variance of transitory earnings in the US reported by Gottschalk and Moffitt (1994). There has also been a rise in the transitory variance in the UK, noted by Dickens (2000). However these facts hardly add up to a full empirical test of the theory. For example, in Europe, TFP growth has been much lower since 1976 than it was in the earlier period and we might expect TFP growth to be positively associated with turbulence. Indeed, the *fall* in TFP growth is one of the main factors generating a rise in unemployment in Blanchard and Wolfers (2000). Furthermore, there is no evidence of any significant changes in the rates of job creation and job destruction over the relevant period (Davis and Haltiwanger, 1999). Finally, no evidence is presented which explains why the various European countries have such widely differing unemployment patterns. So while the Lungqvist and Sargent model may capture an element of the story, it hardly comes close to a full explanation.

Turning now to studies which simply rely on changing institutions to explain unemployment patterns, the work of Belot and Van Ours (2000, 2001) provides two straightforward examples and is closer in spirit to our analysis. They provide a good explanation of changes in unemployment in 18 OECD countries, although in order to do so they make extensive use of interactions between institutions, something which has a sound theoretical foundation; see Coe and Snower (1997) for example. Their model is, however, static like that of Blanchard and Wolfers.

In the light of this discussion, we propose first, to see how much the institutional information described in Section 1 can explain if it is taken more or less straight and second, we shall add interactions between institutions and shocks (captured by time dummies) to investigate whether they provide additional explanatory power.

## 3. Explaining Unemployment

In this Section we report on our empirical investigation of the changes in unemployment in the OECD since the 1960s. This we do in two ways. First, we see how

much we can explain by simply considering changes in institutions along with the shocks which explain deviations between actual and equilibrium unemployment. Second, we investigate how much extra we can explain by including interactions between fixed institutional averages and 'shocks' as captured by time dummies. This method of specifying the shocks/institutions interaction model is the one which fits the data best (Blanchard and Wolfers, 2000, Tables 1 and 5).

Table 5

*Explaining OECD Unemployment,* 1961–95

| | Dependent Variable: $u_{it}$ (%) | | |
|---|---|---|---|
| Independent Variables | 1 | 2 | 3 |
| $u_{it-1}$ | 0.86 (48.5) | 0.86 (44.2) | 0.87 (47.6) |
| *Employment protection*$_{it}$ | 0.15 (0.9) | 0.09 (0.5) | 0.15 (0.9) |
| *Employment protection*$_{it} \times u_{it-1}$ | | 0.03 (1.5) | |
| *benefit replacement ratio*$_{it}$ | 2.21 (5.4) | 2.40 (5.4) | 2.20 (5.2) |
| *benefit duration*$_{it}$ | 0.47 (2.5) | 0.38 (1.6) | 0.40 (2.1) |
| *ben.dur.*$_{it} \times$ *ben. rep.ratio*$_{it}$ | 3.75 (4.0) | 4.12 (4.0) | 3.07 (3.2) |
| $\Delta$ *union density*$_{it}$ | 6.99 (3.2) | 3.29 (1.5) | 5.97 (2.6) |
| *Coordination*$_{it}$ | −1.01 (3.5) | −0.93 (3.2) | −0.90 (3.0) |
| *coord*$_{it} \times$ *union density*$_{it}$ | −6.98 (6.1) | −6.22 (5.0) | −7.48 (6.5) |
| *total employment tax rate*$_{it}$ | 1.51 (1.7) | 2.29 (2.4) | 1.59 (1.8) |
| *coord*$_{it} \times$ *tot.emp.tax rate*$_{it}$ | −3.46 (3.3) | −2.87 (2.5) | −3.63 (3.4) |
| *owner occupied*$_{it}$ | | | 3.02 (1.2) |
| *labour demand shock*$_{it}$ | −23.6 (10.4) | −27.1 (10.6) | −24.9 (10.6) |
| *tfp shock*$_{it}$ | −17.9 (14.1) | −18.9 (14.1) | −17.5 (3.3) |
| *real import price shock*$_{it}$ | 5.82 (3.3) | 6.25 (3.5) | 5.00 (2.8) |
| *money supply shock*$_{it}$ | 0.23 (0.9) | 0.56 (1.9) | 0.24 (1.0) |
| *real interest rate*$_{it}$ | 1.81 (1.6) | 1.36 (1.1) | 2.54 (2.1) |
| time dummies | ✔ | ✔ | ✔ |
| country dummies | ✔ | ✔ | ✔ |
| country specific trends | ✔ | ✔ | ✔ |
| $N$ | 20 | 20 | 19 |
| $NT$ | 600 | 600 | 579 |

*Notes*

*Estimation*:

Generalised least squares allowing for heteroscedastic errors and country specific first order serial correlation. Each equation contains country dummies, time dummies and country specific trends.

Tests

(a) *Poolability*: the large sample version of the Roy (1957), Baltagi (1995) test for common slopes is $\chi^2(190) = 87.7$, so the null of common slopes is not rejected.

(b) *Heteroscedasticity*: with our two way error component model, the error has the form $\alpha_i + \alpha_t + \varepsilon_{it}$. The null we consider is that $\varepsilon_{it}$ is homoscedastic. Using a groupwise likelihood ratio test, the null is rejected ($\chi^2(19) = 843.9$) so we allow for heteroscedasticity.

(c) *Serial Correlation*: assuming a structure of the form $\varepsilon_{it} = p\varepsilon_{it-1} + v_{it}$, the null $p = o$ is rejected using an LM test ($\chi^2(1) = 77.3$). So we allow for first order autoregressive errors with country specific values of p.

(d) *Cointegration*: for most of the variables, the null of a unit root cannot be rejected (except for the shock variables). To test for cointegration, we use the Maddala and Wu (1999) test. Under this test, using Dickey-Fuller tests for individual countries, the null of no cointegration is rejected ($\chi^2(40) = 75.9$). This test relies on no cross-country correlation. Our use of time dummies should capture much of the residual cross-correlation in the data.

*Variables*:

The benefit replacement ratio, union density, employment tax rate and the owner occupation rate are proportions (range 0–1), benefit duration has a range (0–1.1) and employment protection, co-ordination are indices (ranges 0–2, 1–3). All variables in the interaction terms are expressed as deviations from the sample means.

### 3.1. *The Model Based on Changing Institutions*

The basic idea is to explain unemployment, first by those factors that impact on equilibrium unemployment and, second, those shocks which cause unemployment to deviate from equilibrium unemployment. These would include the demand shocks, productivity and other labour demand shocks and wage shocks described in Section 2.[16] In Table 5, we present three basic equations, each equation having country dummies, time dummies and country specific trends as well as a lagged dependent variable. The inclusion of these latter variables is to ensure that the estimated coefficients on the institution variables are not distorted by omitted trended variables in each country or common shocks. A standard cointegration test confirms that our equation explains unemployment in the long run despite the rather high value of the coefficient on the lagged dependent variable. This reflects a high level of persistence and/or the inability of the included variables fully to capture what is going on. Recall that we are eschewing the use of shock variables that last for any length of time, so we are relying heavily on our institution variables.

Looking further at how well we are doing, we see in Table 6 that with the exception of Portugal, the time dummies and the country specific time trends are not close to significance. So how well does our model fit the data? Given the high

Table 6

*Time Dummies, Time Trends* (Units: Percentage Points)

*Time Dummies*

| | | | | | |
|---|---|---|---|---|---|
| 1966 | 0.07 (0.3) | 1976 | 0.69 (0.6) | 1986 | 0.62 (0.3) |
| 1967 | 0.02 (0.1) | 1977 | 0.61 (0.5) | 1987 | 0.79 (0.4) |
| 1968 | 0.11 (0.3) | 1978 | 0.72 (0.5) | 1988 | 0.56 (0.3) |
| 1969 | −0.06 (0.1) | 1979 | 0.59 (0.4) | 1989 | 0.53 (0.2) |
| 1970 | 0.11 (0.2) | 1980 | 0.55 (0.4) | 1990 | 0.98 (0.4) |
| 1971 | 0.37 (0.6) | 1981 | 1.14 (0.7) | 1991 | 1.33 (0.5) |
| 1972 | 0.50 (0.7) | 1982 | 1.41 (0.8) | 1992 | 1.62 (0.6) |
| 1973 | 0.28 (0.3) | 1983 | 1.21 (0.7) | 1993 | 1.55 (0.6) |
| 1974 | 0.08 (0.1) | 1984 | 0.69 (0.4) | 1994 | 1.14 (0.4) |
| 1975 | 0.92 (0.9) | 1985 | 0.52 (0.3) | 1995 | 0.58 (0.2) |

*Time Trends*

| | | | |
|---|---|---|---|
| Australia | −0.054 (0.5) | Japan | −0.059 (0.6) |
| Austria | −0.059 (0.6) | Netherlands | −0.045 (0.5) |
| Belgium | −0.022 (0.2) | Norway | −0.067 (0.7) |
| Canada | −0.072 (0.8) | NZ | 0.003 (0.0) |
| Denmark | −0.078 (0.8) | Portugal | −0.107 (1.1) |
| Finland | 0.017 (0.2) | Spain | 0.042 (0.4) |
| France | −0.019 (0.2) | Sweden | −0.078 (0.8) |
| Germany (W) | −0.006 (0.1) | Switzerland | −0.041 (0.4) |
| Ireland | 0.022 (0.2) | UK | −0.007 (0.1) |
| Italy | −0.015 (0.2) | US | −0.026 (0.3) |

*Note:*
Taken from regression reported in column 1 of Table 5. t ratios in brackets.

[16] See Layard *et al.* (1991, pp. 370–4) or Nickell (1990), for a simple derivation.

level of the lagged dependent variable coefficient, we feel that presenting a dynamic simulation for each country is a more revealing measure of fit than country specific $R^2$, and these are presented in Figure 1. Overall, the equation appears to do well, particularly for those countries with big changes in unemployment. To summarise the importance of the institution variables, we see in Table 7 that if we exclude the institutions, the average fit of the model worsens by about 50%, even if we already include country and time dummies, country trends and shocks. Given that the institutions are generally measured with error, this level of impact is not at all bad.

So what sort of effects do the institutions have on unemployment? Both employment protection and employment taxes have a positive effect with the latter being modified in economies with co-ordinated wage bargaining. However, the impact of employment protection mainly operates via its impact on

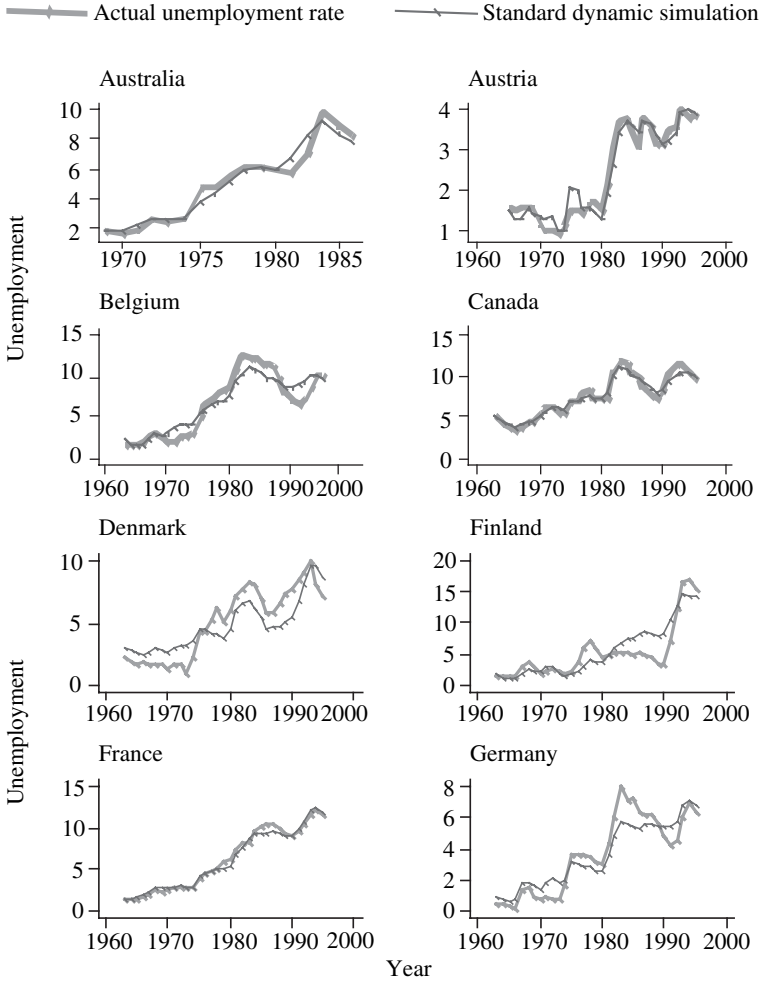


Fig. 1. *A Dynamic Simulation of the Baseline Unemployment Model*

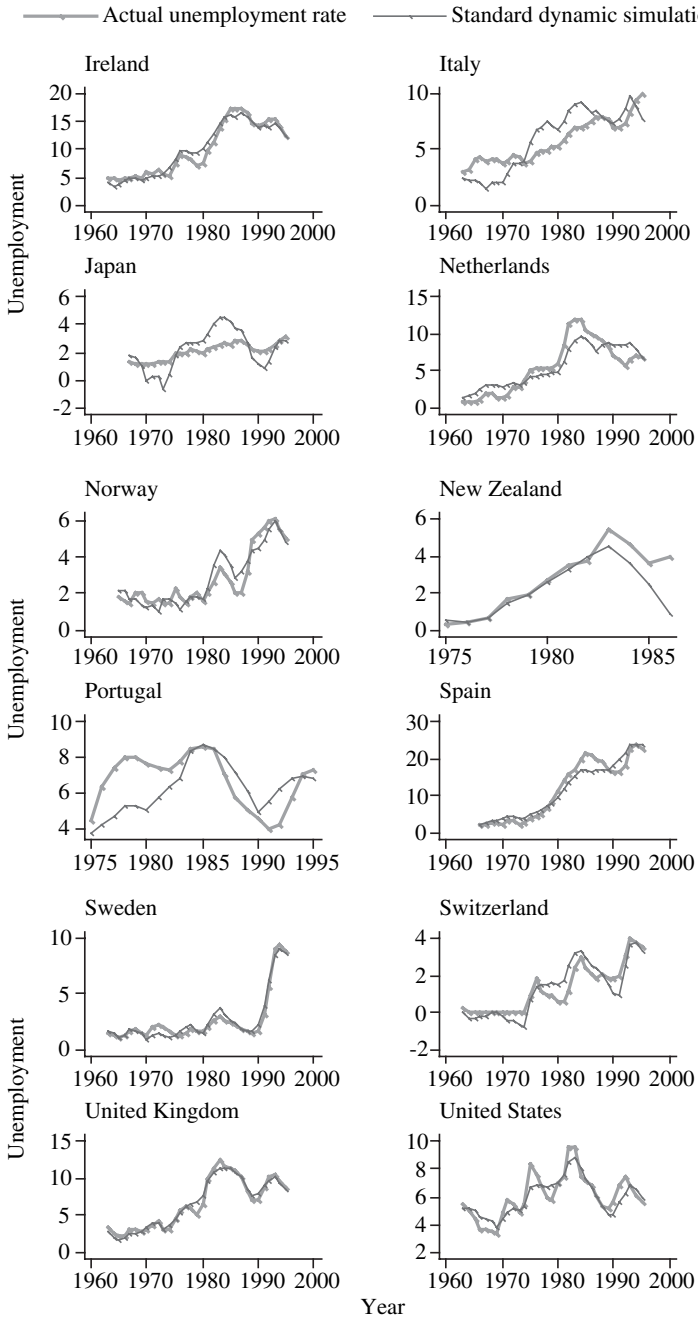


Fig. 1. *Continued*

raising unemployment persistence (see column 2). Our tax effects are not nearly as large as those of Daveri and Tabellini (2000) with a 10 percentage point increase in the total employment tax rate leading to around a 1 percentage point

Table 7

*Squared Deviations of Unemployment from the Fitted Value Generated by a Dynamic Simulation*

| Variables Included | Average Squared Deviation | Average Squared Deviation (excluding Japan) |
|---|---|---|
| Country Dummies | 1 | 1 |
| Country Dummies, Time Dummies, LDVs, Shocks | 0.56 | 0.36 |
| Country Dummies, Time Dummies, LDVs, Shocks, Country trends | 0.45 | 0.27 |
| Country Dummies, Time Dummies, LDVs, Shocks, Country Trends, Institutions | 0.32 | 0.18 |

*Notes*: The average squared deviation is defined as

$$1/20 \sum_i \left[ \frac{1}{T_i} \sum_t (u_{it} - \hat{u}_{it})^2 / \mathrm{Var} u_{it} \right]$$

where $\mathrm{Var} u_{it} = 1/T_i \sum_i (u_{it} - \bar{u}_{it})^2$, $\bar{u}_{it} = 1/T_i \sum_t u_{it}$, $\hat{u}_{it}$ is the fitted value of $u_{it}$ generated by a dynamic simulation.

rise in unemployment in the long run at average levels of co-ordination (see column 1).

Turning to the benefit system, benefit levels have an important impact on unemployment as does benefit duration and their interaction. By contrast, we can find no significant effect of union density on unemployment although we do find a positive rate of change effect. This suggests that increasing union pressure on wages signalled by a rise in unionisation raises unemployment. But this effect dies away if union density subsequently stabilises at the new higher rate.[17] We do find a positive role for owner occupation but it is not very significant (see column 3). Finally, the impact of the import price and TFP shocks seem sensible, so a rise in import prices or a slow down in TFP growth will generate temporary rises in unemployment. However, while money supply shocks do not have any effect, aggregate demand shocks as captured by labour demand equation residuals have a strong effect, as might be expected. The real interest rate does have some positive impact.

So it appears that, overall, changing labour market institutions provide a reasonably satisfactory explanation of the broad pattern of longer-term unemployment shifts in the OECD countries. With better data, e.g. on union coverage or the administration of the benefit system, we could probably generate a more complete explanation, in particular one which did not rely on such a high level of endogenous persistence to fit the data. To see how well the model is performing

[17] There is some evidence that unemployment has a negative long-run effect on union density, although the initial impact is lagged one year (Checchi and Visser, 2002). This might generate a downward bias on the positive short-run density effect which we find in Table 5. Absence of suitable instruments means we are unable to pursue this further.

from another angle, we present in Figure 2 a dynamic simulation of the model *fixing* all the institutions from the start. In the following countries, changing institutions explain a significant part of the overall change in unemployment since

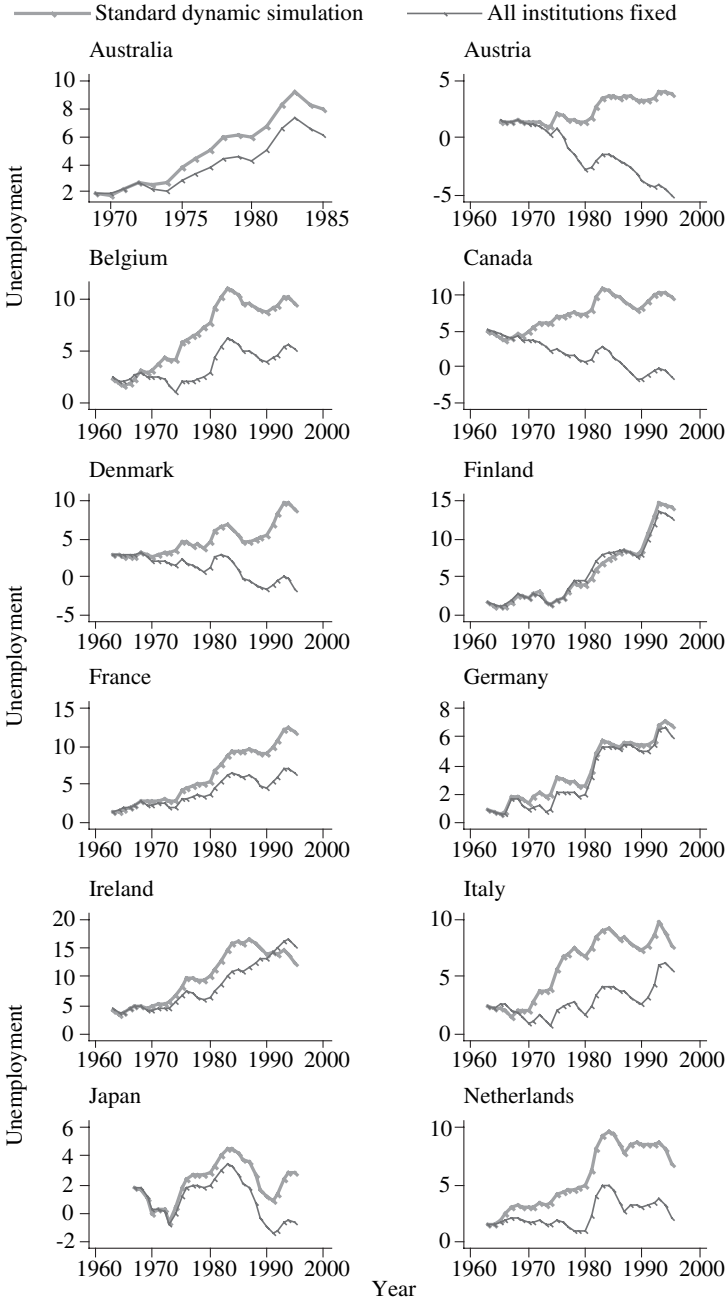


Fig. 2. *A Dynamic Simulation of the Baseline Unemployment Model with the Institutions Fixed*

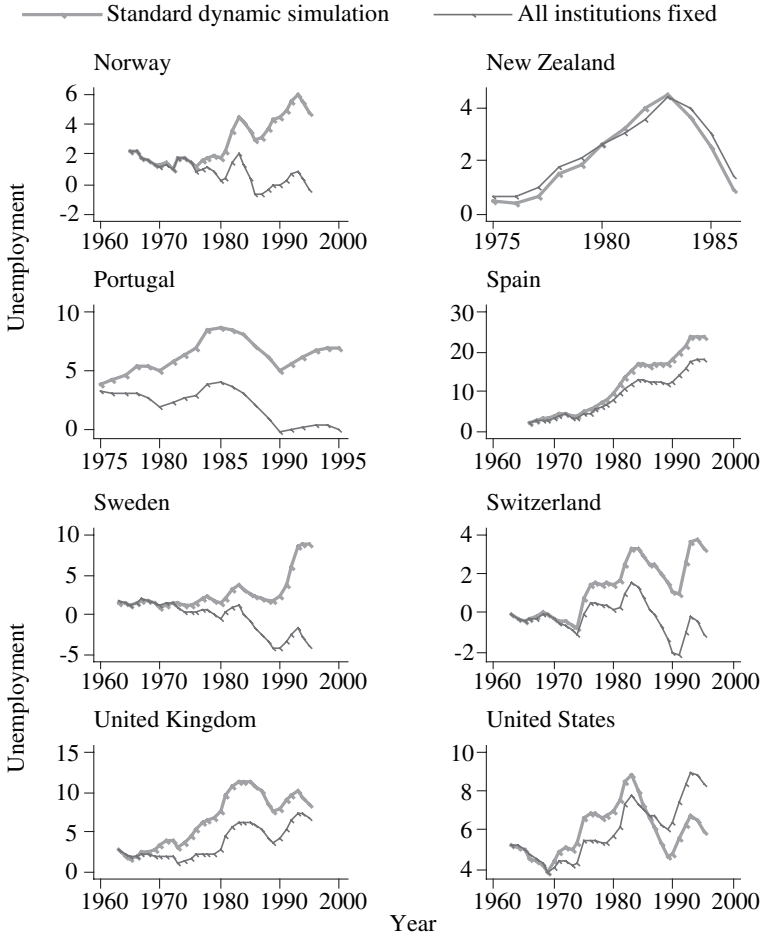


Fig. 2. *Continued*

the 1960s: Australia, Austria, Belgium, Denmark, France, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK. They explain very little in Finland, Germany, New Zealand.

So given the dramatic rise in European unemployment from the 1960s to the 1980s and early 1990s, how much of an overall explanation do our institutional variables provide? Consider the period from the 1960s to 1990–5. Over this period, the unemployment rate in Europe, as captured by the European OECD countries considered here,[18] rose by around 6.8 percentage points. How much of this increase do our institutional variables explain? Based on the dynamic simulations keeping institutions fixed at their 1960s values shown in Figure 2, the answer is around 55%. Given that the period 1990–5 was one of deep

[18] We are excluding Greece, Luxembourg and Eastern Europe.

recession in much of Europe, this level of explanation is highly significant. So what proportions of this latter figure are contributed by the different types of institution? Changes in the benefit system are the most important, contributing 39%. Increases in labour taxes generate 26%, shifts in the union variables are responsible for 19% and movements in employment protection law contribute 16%. So the combination of benefits and taxes are responsible for two-thirds of that part of the long-term rise in European unemployment that our institutions explain.

### 3.2. *Institutions Interacted with Shocks*

In Table 8, we look at the contribution of institution/shock interactions to OECD unemployment patterns. In column 1, we present the basic model where

Table 8

*Explaining OECD Unemployment,* 1961–95

| | Dependent Variable: $u_{it}$ (%) | | |
|---|---|---|---|
| Independent Variables | 1 | 2 | 3 |
| $u_{it-1}$ | | 0.85 (38.9) | 0.85 (38.1) |
| *employment protection*$_{it-1} \times u_{it-1}$ | | | 0.068 (2.3) |
| *employment protection*$_{it}$ | | −0.37 (1.4) | −0.36 (1.4) |
| *benefit replacement ratio*$_{it}$ | | 1.93 (3.4) | 1.88 (3.4) |
| *benefit duration*$_{it}$ | | 0.36 (1.2) | 0.34 (1.1) |
| *ben.dur.*$_{it} \times$ *ben.rep.ratio*$_{it}$ | | 2.91 (2.2) | 2.57 (1.9) |
| $\Delta$ *union density*$_{it}$ | | 4.36 (1.7) | 4.16 (1.9) |
| *co-ordination*$_{it}$ | | −0.70 (2.30) | −0.70 (2.3) |
| *co-ord*$_{it} \times$ *union density*$_{it}$ | | | −5.50 (3.4) |
| *employment tax rate*$_{it}$ | | 1.25 (1.1) | 1.49 (1.3) |
| *co-ord*$_{it} \times$ *emp.tax rate*$_{it}$ | | −1.35 (0.9) | −1.49 (1.0) |
| $\lambda_t$ | ✔ | ✔ | ✔ |
| $\lambda_t \times$ *employment protection*$_i$ | 0.43 (5.9) | 0.11 (0.7) | 0.22 (1.5) |
| $\lambda_t \times \Delta$ *union density*$_i$ | 6.03 (2.8) | | |
| $\lambda_t \times$ *union density*$_i$ | | 0.12 (0.2) | 0.12 (0.2) |
| $\lambda_t \times$ *benefit replacement ratio*$_i$ | 1.31 (6.8) | 2.34 (3.9) | 2.38 (4.0) |
| $\lambda_t \times$ *benefit duration*$_i$ | 0.98 (8.6) | 1.24 (4.4) | 1.17 (4.3) |
| $\lambda_t \times$ *coordination*$_i$ | −0.38 (6.4) | −0.18 (1.3) | 0.26 (1.8) |
| $\lambda_t \times$ *employment tax rate*$_i$ | −1.69 (6.0) | −0.90 (1.2) | −0.99 (1.3) |
| *labour demand shock*$_{it}$ | | −22.1 (8.6) | −22.1 (8.6) |
| *tfp shock*$_{it}$ | | −21.5 (13.5) | −21.5 (13.6) |
| *real import price shock*$_{it}$ | | 3.83 (2.1) | 3.22 (1.7) |
| *money supply shock*$_{it}$ | | 0.42 (1.6) | 0.45 (1.8) |
| *real interest rate*$_{it}$ | | 2.07 (1.7) | 2.58 (2.1) |
| *country dummies* | ✔ | ✔ | ✔ |
| *country trends* | ✔ | ✔ | ✔ |
| $N$ | 20 | 20 | 20 |
| $NT$ | 646 | 600 | 600 |
| $R^2$ | 0.78 | 0.98 | 0.98 |

*Notes:*
The institution variables are the same as in Table 5. Those interacted with the time dummies are sample averages.
The interaction of time dummies with institutions is a non-linear specification (i.e. it has the form $\lambda_t (1 + \sum_k X_{ik} b_k)$ where $\lambda_t$ are time dummies and $X_{ik}$ are labour market institutions) and so the model is estimated by non-linear least squares.

unemployment is explained by time dummies interacted with the institution variables averaged over the sample period. This corresponds to the basic equation in Table 1 of Blanchard and Wolfers (2000), although we use annual data rather than five-year averages. The time effects are highly significant and generate a rise in unemployment between 1995 and the mid-1960s of 6.9 percentage points at average levels of the institution variables. This is almost identical to the 7.2 percentage points reported in Blanchard and Wolfers (2000) despite the differences in the institution variables and the use of annual data rather than five-year averages.

In columns 2 and 3, we add these interactions to the basic models of Table 5 (columns 1 and 2). Because this augmented model has to be estimated by nonlinear least squares, it cannot be directly compared with the GLS estimated models of Table 5, but what we find is that the interacted time effects are first, insignificant (i.e., the estimated time dummies are jointly insignificant) and second make no contribution to the overall rise in unemployment. Indeed the estimated contribution of the time dummies at the average institution values from the mid 1960s to 1995 is negative. So while the institutions/shock model explains the data quite well in Table 8, column 1, the variables of this model make no real contribution to understanding unemployment changes when used to augment the simple institutional change model reported in Table 5.

## 4. Summary and Conclusions

We have undertaken an empirical analysis of unemployment patterns in the OECD countries from the 1960s to the 1990s. This has involved a detailed study of shifts in unemployment in twenty countries. The aim has been to see if these shifts can be explained by changes in those labour market institutions which might be expected to impact on equilibrium unemployment. In this context, it is important to recall that unemployment is always determined by aggregate demand. As a consequence we are effectively trying to understand the long-term shifts in both unemployment and aggregate demand (relative to potential output). We emphasise this because it is sometimes thought that the fact that unemployment is determined by aggregate demand factors is somehow inconsistent with the notion that unemployment is influenced by labour market institutions. This is wholly incorrect.

Our results indicate the following. First, broad movements in unemployment across the OECD can be explained by shifts in labour market institutions. To be more precise, changes in labour market institutions explain around 55% of the rise in European unemployment from the 1960s to the first half of the 1990s, much of the remainder being due to the deep recession ruling in the latter period. Second, interactions between average values of these institutions and shocks, captured by time dummies, make no significant additional contribution to our understanding of OECD unemployment changes.

## Data Appendix

*The countries in the sample are:*

| | | | |
|---|---|---|---|
| Australia | Finland | Japan | Spain |
| Austria | France | Netherlands | Sweden |
| Belgium | Germany | Norway | Switzerland |
| Canada | Ireland | New Zealand | United Kingdom |
| Denmark | Italy | Portugal | United States |

Where possible, the data refer to West Germany throughout.
The latest version of these data (mostly 1960–95) may be found attached to D.P.502 at http://cep.lse.ac.uk/papers/

*Benefit Replacement Rate*
Benefit entitlement before tax as a percentage of previous earnings before tax. Data are averages over replacement rates at two earnings levels (average and two-thirds of average earnings) and three family types (single, with dependent spouse, with spouse at work). They refer to the first year of unemployment. Source: OECD (Database on Unemployment Benefit Entitlements and Replacement Rates). The original data are for every second year and have been linearly interpolated.

*Benefit Duration Index*
[0.6 × replacement rate in 2nd/3rd year of an unemployment spell + 0.4 × replacement rate in 4th/5th year of an unemployment spell] ÷ [replacement rate in 1st year of an unemployment spell]. Replacement rate defined as above. Source: OECD, as above.

*Trade Union Density*
This variable is constructed as the ratio of total reported union members (less retired and unemployed members), from Ebbinghaus and Visser (2000).

*Co-ordination Index* (*1-3*)
This captures the degree of consensus between the actors in collective bargaining. 1 low, 3 high. There are two series. 1. Based on interpolations of OECD data (*OECD Employment Outlook* 1994, 1997) and data made available by Michèle Belot, described in Belot and van Ours (2000). 2. Based on data reported in *OECD Employment Outlook* (1994, 1997), Traxler (1996), Ferner and Hyman (1998), Windmüller (1987), Bamber and Lansbury (1998). For full details, see Ochel (2000*b*). The first series is used in all the regressions reported in the paper.

*Employment Protection Index* (*0-2*)
This captures the strictness of employment protection laws. 0 low, 2 high. Made available by Olivier Blanchard. Based on the series used by Lazear (1990) and that reported in *OECD Employment Outlook* (1999). The series is an interpolation of 5 year averages.

*Labour Taxes*
This consists of the payroll tax rate plus the income tax rate plus the consumption tax rate. These are taken from the CEP-OECD Dataset (Centre for Economic Performance, London School of Economics) and are mainly based on OECD National Accounts.

(*i*) Payroll tax rate = $EC/(IE - EC)$, $EC = EPP + ESS$. $EPP$ = employers' private pensions and welfare plans contributions, $ESS$ = employers' social security contributions, $IE$ = compensations of employees;
(*ii*) Income tax rate = $(WC + IT)/HCR$. $WC$ = employees' social security contributions, $IT$ = income taxes, $HCR$ – households' current receipts;
(*iii*) Consumption tax rate = $(TX - SB)/CC$. $TX$ = indirect taxes, $SB$ = subsidies, $CC$ = private final consumption expenditure.

*Owner Occupation Rate*
Refers to the percentage of the housing stock classified as owner occupied. The data were supplied by Andrew Oswald and have been heavily interpolated. Not available for Portugal.

*Unemployment Rate*
Where possible, these correspond to OECD standardised unemployment rates and conform to the ILO definition. For Italy; the data correspond to 'unemployment rates on US concepts' from the US Bureau of Labor Statistics. For earlier years, we use data reported in Layard *et al.* (1991), Table A3. For later years we use *OECD Employment Outlook* (2000), Table A and *UK Employment Trends* Table C 51.

*Real Import Prices*
Defined as the import price deflator normalised on the GDP deflator. Source: OECD, *National Accounts* and *Main Economic Indicators*. The real import price shock is the change in the log of real import prices times the share of imports in GDP (OECD *Main Economic Indicators*).

*Trend Productivity*
Based on the Hodrick-Prescott trend of (log real GDP – log employment).

*Real Interest Rate*
Long term nominal interest rate less the current rate of inflation from the OECD Economic Outlook Database.

*Total Factor Productivity* (*TFP*)
Based on the Solow residual for each country, smoothed using a Hodrick-Prescott filter. We then the deviation of the Solow residual from its HP filter trend. This is used in the unemployment equations as the TFP shock.

*Labour Demand Shock*
Residuals from country specific employment equations, each being a regression of employment on lags of employment, real wages and output (see footnote13).

*Money Supply Shock*
$\Delta^2$ ln (*money supply*) from OECD Economic Outlook database.

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