

# **Cross-Country Studies of Unemployment in Australia\***

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## **Abstract**

This paper reviews evidence on causes of unemployment in Australia from cross-country studies of the relation between the rate of unemployment and a range of macroeconomic and institutional factors. An overview of the evolution of this literature and of the possible institutional factors that might affect labour market outcomes is presented. The main findings from the different types of studies are summarised, and results from some studies are applied to show the particular set of factors that account for increases in the rate of unemployment in Australia between the 1960s and 1990s. Finally, an evaluation of some problems with cross-country studies is presented.

## **1. Introduction**

This paper reviews findings on the causes of unemployment in Australia from cross-country studies that present empirical analyses of the relation between the rate of unemployment and a range of explanatory factors using data from multiple countries (and generally across several time periods).

There are two main reasons for thinking that a review of these types of studies is important. First, the cross-country aspect of the studies allows a greater focus on the role of institutional factors in explaining unemployment than in other empirical approaches. (The idea here being that cross-country differences in institutions will allow the effect of institutional factors on unemployment to be identified by inter-country variation in those institutions, whereas single country studies, where institutions may remain unchanged over long periods, will not allow such effects to be identified.) Second, the findings of cross-country studies appear to have been particularly influential in guiding the policy prescriptions of some agencies such as the OECD.

In section 2 a brief overview of the evolution of the cross-country literature is presented. Section 3 describes the main institutional variables that have been included in the cross-country studies as potential explanatory factors for unemployment. Section 4 provides a detailed description of the findings from what appear to be the three main recent contributions to the cross-country literature. Section 5 describes some problems with the cross-country methodology, and in section 6 an overall assessment is presented.

## **2. Evolution of literature**

The development of cross-country studies of the determinants of unemployment appears to have proceeded in two stages. In the first stage two main types of studies were undertaken. First, some studies presented summary information or statistics on the cross-country correlation between unemployment and institutions. A notable example would be the work of Calmfors and Driffill (1988) that reported data on the level and change in the rate of unemployment for countries classified as having centralised, intermediate or decentralised wage-setting systems, and also undertook simple regression analysis of the relation between the rate of unemployment and an index of centralisation (see also Freeman, 1988, Calmfors, 1993, and Wooden and Sloan, 1998).

Second, some studies calculated measures of real or nominal wage responsiveness to changes in unemployment and examined the cross-country correlation between the wage rigidity measures and institutional factors such as union density or degree of centralisation in wage-setting. (Examples are Bruno and Sachs, 1985, Bean et al., 1986, Newell and Symons, 1987, and Alogoskoufis and Manning, 1988.)

The second stage of studies have involved estimation of panel regressions for the determinants of the rate of unemployment (using data on multiple countries and for several time periods) incorporating a fairly wide range of institutional factors such as income support provisions and expenditure on labour market programs as well as variables to proxy for wage-setting institutions. This type of approach to cross-country analysis can be seen to begin with Layard et al. (1991), and has been the main methodology applied since that time through to the recent contribution of Blanchard and Wolfers (2000).

Three main features distinguish the ‘first stage’ from ‘second stage’ studies. First, the range of institutional factors considered in the second stage studies has been much broader than in the first stage studies where generally the only factors considered were union density and a centralisation/corporatism wage-setting index. Second, for most first stage studies only a single cross-section of data is examined, whereas the second stage studies use data from at least a 10 year period. Finally, the other important distinction (at least for the purposes of this paper) is that almost all the first stage studies do not include Australia (exceptions are Bean et al., 1986, and Calmfors and Driffill, 1988) whereas the second stage studies mainly draw on data for the OECD group of countries of which Australia is a part.

In the subsequent sections of this paper we focus on presenting a review of research from the second stage studies. This is motivated by the greater relevance of those studies to the case of Australia, and by the fact that the methodology in those studies appears to be considered ‘state of the art’ for cross-country analysis. In particular, we will examine three groups of studies: first, a series of papers which include various combinations of Layard, Nickell and Jackman as authors (Layard et al., 1991, Jackman et al., 1996, Nickell, 1997, and Nickell and Layard, 1999); second, papers associated directly with the OECD (Scarpetta, 1996, and OECD, 1997); and third, papers by

Blanchard (Blanchard, 1999, and Blanchard and Wolfers, 2000). As will be described below, each of these groups of papers uses the same basic approach to cross-country analysis of the determinants of unemployment, but each also has some important distinguishing features.

### **3. Institutional factors**

Cross-country studies (second stage) of the determinants of unemployment have tended to consider fairly similar sets of explanatory variables. Five main aspects of the institutional setting are covered by these explanatory variables: taxes; employment protection; wage-setting system; active labour market programs; and income support arrangements.

Cross-country differences in taxes are generally represented by a tax wedge variable. This variable is intended to capture the size of the gap between the real cost of labour per worker and the consumption wage per worker. The tax wedge will be a function of the income tax rate, payroll tax rate, and consumption tax rate. For example, Nickell and Layard (1999) express the tax wedge as:

$$(1 - \text{income tax rate}) * (1 - \text{payroll tax rate}) / (1 - \text{consumption tax rate}).$$

Employment protection relates to the nature of labour standards and job security provisions. As a proxy for this variable cross-country studies use an 'employment protection index' that assigns each country some ranking on a specified scale. For example, Nickell and Layard (1999) use a scale (from 0 to 10) that is constructed from a set of sub-indices that rank countries according to their degree regulation of working hours; scope for fixed term employment contracts; employment protection provisions; minimum wage provisions; and employee representation rights.

Income support arrangements are generally represented in cross-country studies by variables for unemployment benefit duration (for example, on a scale from 0 to 4 where 4 = indefinite in Nickell and Layard, 1999), and the unemployment benefit replacement rate (unemployment benefit divided by a measure of average income or wages). Use of active labour market programs in a country is most usually proxied for using expenditure on those programs as a percentage of GDP.

Explanatory variables to proxy for cross-country differences in wage-setting systems seek to represent two main dimensions of those systems. First, variables for union density and union coverage (percent of the workforce covered by collective agreements) seek to capture the role of collective organisation of employees in wage-setting. Second, variables for the degree of coordination and centralisation in wage-setting represent respectively the extent to which unions and/or firms coordinate their activities in wage bargaining, and the locus at which wage bargaining occurs. The degree of coordination and centralisation in wage-setting is proxied for by indices – for example, Nickell and Layard use a coordination index (value for each country between 2 and 6) that is the sum of indices for union coordination and employer coordination (each ranges from 1 to 3 where 1=low; 2=medium; and 3=high).

A theoretical motivation for using these types of institutional factors as explanatory variables for unemployment can come from a variety of sources. First, some theoretical modelling focuses on the relation between one of the types of institutional factors and unemployment; an example would be Calmfors and Driffill's (1988) analysis of the relation between the degree of centralisation in wage bargaining and unemployment. Second, there have been some attempts to develop more general models that can encompass the role of multiple institutional factors.

As an example of the second approach Nickell and Layard (1999) develop a simple theoretical model of the aggregate labour market where wage-setting at each firm occurs through an efficient bargains model between a union and the firm, and where the firm has the unilateral right to set employment (after wages are determined). In this model equilibrium unemployment is shown to be positively related to union power, negatively related to the extent to which the union takes into account the effects of wage outcomes on employment; negatively related to worker search effectiveness; and positively related to the level of unemployment benefits.

These relationships in the theoretical model can be used to motivate inclusion in the empirical unemployment model of union density/coverage variables (as proxies for union power); employment protection and centralisation/coordination variables (as proxies for the extent to which unions take into account wage effects on employment); active labour market program expenditure (as a proxy for worker search effectiveness);

and replacement rate and benefit duration variables (as a proxy for the effects of unemployment benefits). The one type of variable that it is difficult to motivate from the general theoretical framework is the tax wedge variable. Where unemployment benefits are indexed to post-tax earnings then changes in taxes will have equivalent effects on a worker's opportunities inside and outside a firm – hence taxes will not affect wage outcomes or employment determination. Hence, for taxes to have an effect in the type of model considered by Nickell and Layard it is necessary for benefits to not vary proportionately with post-tax earnings.

#### **4. Review of main findings**

In this section the main findings from three cross-country studies (each chosen to be representative of one of the main groups of second stage cross-country studies) are reported. Findings for a benchmark regression from each study are presented in Table 1.

The Nickell and Layard (1999) study uses data for 20 countries and for two time periods (1983-88 and 1989-94) to estimate a random effects model for the determinants of the log rate of unemployment. The study includes a single macro variable – the change in the rate of inflation – that is found to be negatively related to the rate of unemployment. Of the institutional variables, the tax wedge is positively related, employment protection is not significantly related, and expenditure on active labour market programs is positively related to unemployment. Higher union density and union coverage raise unemployment, but this effect can be offset by coordination in wage bargaining between employers and unions which has an inverse relation to unemployment. Both the replacement rate and benefit duration are found to be positively related to the rate of unemployment. Finally, the study also includes a variable for the proportion of the population who are home owner-occupiers, which is found to have a positive relation to the rate of unemployment.

*Table 1*

	<b>Nickell and Layard (1999)</b>	<b>Study: Scarpetta (1996)</b>	<b>Blanchard and Wolfers (2000)</b>
Countries	20	17	
Time period	1983-88 and 1989-94	1983 to 1991	1960-64 to 1995+
Observations	40	181	131
Dependent variable:	Log (rate of unemployment)	Rate of unemployment	Rate of unemployment
Explanatory variables:			
Total tax wedge (%)	0.027 (4.0)		0.033 (2.4)
Employment protection index (1-20)		0.37 (2.64)	0.095 (2.7)
Union density (%)	0.010 (2.3)	0.11 (4.94)	0.033 (3.2)
Union coverage index (1-3)	0.38 (2.7)		-0.501 (1.1)
Coordination (union+ employer) (2-6)	-0.43 (6.1)	-3.08 (5.74)	0.414 (2.9)
Replacement rate (%)	0.013 (3.4)	0.13 (6.96)	0.025 (3.7)
Benefit duration (years)	0.010 (2.2)		0.267 (3.0)
Active LMPs (expenditure as %GDP)	-0.023 (3.3)	-0.05 (1.67)	0.028 (1.4)
Owner occupation rate (%)	0.013 (2.6)		
Change in inflation (% points pa)	-0.21 (2.2)		
Dummy for 1989-94	0.15 (1.5)		
Output gap		-0.52 (16.40)	
TFP growth			0.71 (5.0)
Real rate of interest			0.47 (5.1)
Labour demand 'shift'			0.19 (2.7)

Sources: a) Nickell and Layard (1999, Table 15, column 1; b) Scarpetta (1996, Table 1, column 2); and c) Blanchard and Wolfers (2000, Table 5, column 1).

Notes: t-statistics are in parentheses.

Scarpetta (1996) uses data for 17 countries and annual observations between 1983 and 1993 to estimate a random effects model for the determinants of the rate of unemployment. To explore the role of alternative sets of explanatory variables a range of model specifications are estimated (following Hendry's 'general to particular' estimation approach). This study includes an output gap measure to control for macro effects, and finds that the gap is inversely related to the rate of unemployment. (Nickell and Layard, 1999, p,3055 criticise the use of this variable on the grounds that measures of deviation of trend output can be highly sensitive to the method for calculating the trend component.)

Of the institutional factors in Scarpetta's study the tax wedge is found to be not significantly related, employment protection is positively related, and expenditure on active labour market programs is not significantly related, to the rate of unemployment. (That is, the pattern of variable significance is the exact reverse of Nickell and Layard's findings.) Union density is positively related to the rate of unemployment, and the degree of coordination in wage-setting is inversely related to the rate of unemployment. Substituting a centralisation index for the coordination variable provides some evidence of a hump-shaped relation between centralisation in wage-setting and the rate of unemployment. An index for the level of income support from unemployment benefits (average replacement rates over different benefit durations) is positively related to the rate of unemployment. From other variables that are tested there is some evidence of a positive relation between an index of trade restrictions and the rate of unemployment, but no relation appears to exist with terms of trade or the real interest rate.

The Blanchard and Wolfers study represents a significant extension of the other studies. First, and most importantly, it introduces the idea that cross-country differences in rates of unemployment can be explained by the interaction of macro shocks to each country, and the institutions in those countries. Second, it extends the time period of analysis, using data for eight time periods from 1960-64 to 1995+ for 20 OECD countries, and also undertakes a quite detailed robustness analysis (for example, using alternative measures for institutional factors, and checking the effect of dropping countries).

Blanchard and Wolfers argue that whereas macro shocks can explain the broad time-series pattern of movements in the rate of unemployment they do not explain country-

specific heterogeneity in rates of unemployment; and whereas differences in institutions can explain country-specific heterogeneity in unemployment they cannot explain time-series movements in unemployment between the 1970s and 1980s. However, it is suggested that the interaction of macro shocks and institutions may be able to explain both time-series movements and cross-country differences in rates of unemployment.

Blanchard (1997) has suggested that two main types of macro shocks can explain the broad pattern of time-series movements in unemployment in Europe (and Australia). First, in the 1970s large adverse shifts in ‘labour supply’ occurred. The main source of these shifts is generally considered to have been the failure of wages to adjust to the sustained decline in TFP growth and other adverse supply shocks such as oil price increases. The effect was to decrease profit rates and capital shares, causing firms to shift away from labour thereby resulting in an increase in unemployment. Second, from the early 1980s onwards labour markets have been affected by adverse shifts in ‘labour demand’. Potential explanations for the decrease in labour demand are a shift in the distribution of rents from workers to firms, or technological bias that has decreased the marginal product of labour at a given capital/labour ratio. The adverse shift in labour demand has been an important cause of persistence in unemployment observed in European countries (and Australia) during the 1980s and 1990s. Blanchard (1997) and Blanchard and Wolfers (2000) shows that the set of macro shocks, changes in TFP and in labour demand, as well as movements in real interest rates, seem able to explain the broad evolution of European unemployment. However cross-country differences in the magnitude those macro shocks does not seem sufficient to explain cross-country differences in rates of unemployment.

Theoretical analysis suggests that institutional factors can affect the level and composition of unemployment. Blanchard and Wolfers (2000) argue that – consistent with the theory - existing empirical evidence shows that cross-country differences in institutional factors do a good job of explaining differences in rates of unemployment in the late 1980s and 1990s. However, it does not seem that the way institutions have changed since the early 1970s bears any relation to time-series movements in the rate of unemployment since that time.

That macro shocks or institutional factors alone do not seem able to explain both time-series movements and cross-country differences in rates of unemployment causes Blanchard and Wolfers (2000) to propose that it may be the interaction of those factors that is the key explanatory factor. Interactions between macro shocks and institutions could be important for explaining unemployment movements in two ways. First, institutions can affect the impact of the shocks that increase unemployment. Second, institutions can affect the persistence of unemployment in response to shocks. For example, the effect on unemployment of a slowdown in productivity growth will depend on whether (and how quickly) a corresponding slowdown in wage growth can occur. This is likely to depend on institutional factors such as the degree of centralisation in wage-setting, and union power in wage negotiations.

To examine the role of macro shocks and institutions Blanchard and Wolfers (2000) estimate the model:

$$(1) \quad u_{it} = c_i + \left( \sum_k Y_{kit} a_k \right) \left( 1 + \sum_j X_{ij} b_j \right) + \varepsilon_{it}$$

where  $u_{it}$  = rate of unemployment in country  $i$  in period  $t$ ;  $c_i$  = country-specific intercept;  $Y_{kit}$  = macro shock  $k$  for country  $i$  in period  $t$ ; and  $X_{ij}$  = institutional factor  $j$  for country  $i$ .

In the empirical analysis the macro shock variables are all significant with expected effects on unemployment: a decrease in TFP growth, an increase in the real interest rate, and a decrease in an adjusted labour share measure (to proxy for labour demand), all raise the rate of unemployment. Of the institutional variables increases in the replacement rate and benefit duration increase the rate of unemployment. Union density is positively related, and the degree of coordination in wage-setting inversely related, to the rate of unemployment; but union coverage is not significantly related to unemployment. The tax wedge and employment protection variables are positively related to unemployment; however, no significant relation exists with expenditure on active labour market programs. From a series of robustness checks such as dropping countries one at a time Blanchard and Wolfers conclude that their findings are relatively robust; the main exception is the introduction of time-varying replacement rate and employment protection measures.

One interesting application of the Blanchard and Wolfers model is to examine what factors explain differences in the change in the rate of unemployment between Australia and other countries. Table 2 reports the findings from this type of decomposition exercise. It examines sources of changes in the rate of unemployment differential between Australia and the United States from 1970-74 to 1995+. Over this period the rate of unemployment in Australia rose from 2.2 per cent to 8.5 per cent, and in the United States was relatively steady at 5.4 and 5.5 per cent. Hence the change in the Australia-US differential was 6.2 percentage points.

Table 2 shows that overall macro effects account for about 1.2 percentage points of the rise in the Australia-US unemployment rate differential. Larger increases in the real rate of interest in Australia than the US are primarily responsible for this effect. Of the interactions between institutional variables and the macro shocks differences between income support arrangements and in wage-setting appear particularly important in accounting for the growth in the Australia-US unemployment rate differential. First, differences in replacement rates between Australia and the US can account for a rise of 0.6 percentage points, and longer benefit duration in Australia accounts for a rise of 2.7 percentage points, in the unemployment rate differential. Second, higher union density in Australia than the US accounts for 3.0 percentage points of the growth in the unemployment rate differential, but this is offset by a greater degree of coordination in wage-setting in Australia the effect of which was to lower the differential by 2.1 percentage points. Third, differences in employment protection provisions and the tax wedge also account for a small fraction of the rise in the unemployment rate differential.

*Table 2: Decomposition of sources of differences in changes in rates of unemployment in Australia and United States, 1970-74 to 1995+*

	<b>Effect on change in AUS-US ue rate differential: (percentage points)</b>
<b>A. Macro shocks</b>	
TFP	+0.5
Real rate of interest	+1.9
Labour demand	-1.2
<b>B. Interaction of macro shocks and institutions</b>	
Replacement rate	+0.6
Benefit duration	+2.7
Employment protection	+0.9
Tax wedge	+0.5
Union density	+3.0
Coordination in wage-setting	-2.1
Total	+6.8
Actual change	+6.2

Notes: The change in the Australia-US rate of unemployment differential equals  $(u_{AUS,95+} - u_{AUS,70-74}) - (u_{US,95+} - u_{US,70-74})$ . Data for the decomposition are taken from <http://web.mit.edu/blanchar/www/articles.html>.

Several main points emerge from this review of the main recent cross-country studies of the determinants of unemployment:

1. Modelling that specifies country-specific unemployment as a function of interactions between macro shocks and institutions seems better able to explain time-series movements in unemployment and to capture cross-country heterogeneity than do modelling approaches that include macro shocks or institutional factors separately as explanatory factors for unemployment.
2. The group of cross-country studies reviewed in this section provide consistent support for a relation between the rate of unemployment and income support arrangements, and between the rate of unemployment and wage-setting system. The studies provide mixed evidence on the role of the tax wedge, expenditure on active labour market programs, and employment protection in the determination of unemployment.

3. Applying the Blanchard and Wolfers findings to an analysis of the sources of changes in the Australia-US unemployment rate differential suggest that the main factors that can account for growth in that differential are: higher increases in real interest rates in Australia than the US, and the longer duration of unemployment benefits in Australia than the US. Higher union density in Australia than the US also accounts for a large increase in the unemployment rate differential; but this is mostly offset by the greater degree of coordination of wage-setting in Australia.

## **5. Problems with the cross-country methodology**

Important methodological issues arise in interpreting the findings from the second-stage cross-country studies of the determinants of unemployment. One set of issues concerns the robustness of the empirical findings; the other issue involves theoretical interpretation.

One empirical issue is about measurement of the institutional variables. First, for those aspects of institutional factors that are represented there is often a high degree of subjectivity in how to measure the institution. For example, there has been much debate concerning the correct ordering of and degree of difference between countries in their degree of centralisation or corporatism in wage setting (see for example, the critique of Calmfors and Driffill's ranking by Soskice, 1990). Second, for some institutional factors whether the proxies that have been included as explanatory variables for unemployment provide a comprehensive representation of those factors seems in doubt. For example, studies that seek to proxy for income support provisions by including replacement rate and benefit duration measures, but do not include controls for the extent of work activity tests, could be argued to fail to provide a sufficiently detailed representation of income support policies. To the extent that included aspects are correlated with omitted aspects (for example, benefit duration and strength of work activity tests seem likely to be positively correlated), there may be some bias introduced into the model estimates. Third, almost all of the studies that have been reviewed have institutional variables that do not vary over time (Blanchard and Wolfers, 2000, do experiment with allowing some variables to change over time). Where there have been fairly significant changes in institutions over time (for example, in the degree of

centralisation of wage setting in Australia) this would seem to make interpretation of the findings from the studies difficult.

A second empirical issue concerns model specification. First, it has been suggested that important complementarities may exist between institutional factors (Coe and Snower, 1997). For example, it might be argued that the efficacy of active labour market policies in reducing unemployment, or the effect on unemployment of removing minimum wage restrictions, will be higher where unemployment benefit arrangements are less generous. To the extent that policy complementarities exist it would be necessary to include interactions between the institutional factors as explanatory variables for unemployment. Second, it could be argued that some important institutional factors have been omitted from the analysis. The set of factors included as explanatory variables for unemployment tend to mainly represent labour market or income support-related institutions. One type of factor that is therefore not included is the extent of product market competition. However, the extent of product market competition is likely to have important effects (through its impact on the elasticity of product demand and hence labour demand) on the scope of unions to affect wage-setting (for example, Danthine and Hunt, 1994). With regard to labour market factors or institutions notable omissions from the set of explanatory variables are measures for the skill distribution of the workforce and institutional influences on regional mobility of the workforce. The general point being made here is that it may be necessary to consider a broader set of institutional factors that might affect unemployment, and also interactions between the omitted factors and variables that have been included in existing studies.

A third empirical issue is causality. For some of the institutional factors included as explanatory variables for unemployment there must be significant concern regarding feedback effects from unemployment to the institution. One example is that expenditure on labour market programs is positively related to the rate of unemployment. This example is recognised in some studies, and an attempt made to control for potential joint endogeneity by instrumenting the labour market program variable (for example, Nickell and Layard, 1999). However, joint endogeneity would also seem a potential problem for other institutional factors. For example, in Australia changes to wage-

setting arrangements and income support arrangements have usually been justified in terms of their effects on inflation and unemployment.

The other issue regarding interpretation of results from the cross-country studies is the absence of an underlying theoretical framework. Although some of the explanatory variables for unemployment that have been included in these studies can be loosely motivated using a simple theoretical framework (for example, Nickell and Layard, 1999), the empirical modelling has largely proceeded in an 'ad-hoc' manner without reference to theory. This has two main consequences. First, it is not possible to attach any structural interpretation to the findings from the regression analysis; that is, to understand the behavioural channels through which variables such as union density and the replacement rate affect unemployment. Second, it leaves considerable scope for what Blanchard and Wolfers (2000, p.C22) refer to as "...research Darwinism" where the process of empirical modelling is more about getting significant coefficients on a specified set of explanatory variables, rather than attempting to find the correct model.

## **6. Conclusion**

Cross-country studies appear to have the potential to make a useful contribution to understanding the causes of unemployment. Most notably this type of study offers considerable scope for assessing the role of institutional factors. However, the existing studies using the cross-country methodology do appear to have significant shortcomings that must cast some doubt on the robustness of their findings. Fruitful avenues for future research using this methodology would be to seek to extend the Blanchard and Wolfers modelling approach by dealing with the empirical issues described above, and perhaps adopting a more structural approach to modelling.

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