Unemployment and Labour Market Institutions: The Failure of the Empirical Case for Deregulation

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Preface

One of the most contentious economics policy debates in recent years is the extent to which labour market institutions and regulations are the cause of the widely varying unemployment experiences among the OECD countries since the mid-1970s. Among the labour market institutions commonly referred to are employment protection policies, unemployment insurance benefits (in terms of both replacement rates and duration), unions, payroll taxes, the coordination of collective bargaining and active labour market policies. The basic line of argument driving this debate is that labour market institutions impose rigidities on the free working of labour markets that in turn give rise to unemployment. Though these debates have largely been informed by empirical evidence for the OECD countries, the impacts of these debates for labour market deregulation have been felt in developing countries as well, many of them coming under strong pressure to deregulate their labour markets.

In this paper, the authors assess the strength of the evidence regarding the effects of labour market institutions and regulations on unemployment, updating their earlier survey of the literature to include the most recent studies. Taking all these studies together and based on their own empirical analyses, the authors argue that the empirical results are largely inconclusive, often showing estimates of opposite sign and, even when signs are consistent, of widely ranging values, thus limiting their usefulness in informing policies on labour market regulations.

More than that, the authors conclude that the most robust relationships found in this literature suggest that stronger labour market institutions are associated with lower unemployment. These beneficial effects of labour market institutions on unemployment are found for active labour market policies and the coordination of collective bargaining. The authors also take a more in-depth look at two success story countries, the Netherlands and Ireland, and argue that it was the coordination of collective bargaining that played an important role in their achieving low unemployment rates. More generally, the authors argue that the cases of weak labour market institutions and low unemployment (such as in the United Kingdom and the United States) must be set against the cases of strong labour market institutions and low unemployment (such as in Austria, Denmark, Ireland, the Netherlands, Norway and Sweden), suggesting that there a range of labour market institutions that are compatible with low rates of unemployment.

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1. Introduction

It has become widely accepted that poor employment performance can only be effectively addressed with fundamental reforms of national labour market institutions. Prominent economists and leading international organizations have argued that these institutions have produced rigidities that account for the relatively slow employment growth and persistent high unemployment experienced by much of the developed world over the last two decades. In particular, it is argued that wages for the less-skilled must be made more flexible, reflecting the interplay of demand and supply in local labour markets. This rigidity account has long been a central tenet of orthodox economics, which has attained increasing prominence with the rise in unemployment since 1973. But there is an equally long, if less influential, dissenting position, most famously illustrated by Keynes' attack on economic orthodoxy during the Great Depression.

A great deal of research effort has been devoted to providing empirical support for the rigidity explanation. Leading multi-national institutions began to aggressively promote the need for large-scale labour market deregulation in the early 1990s, most notably in the OECD's massive Jobs Study (1994). The OECD's subsequent Implementation of the Jobs Strategy reports (OECD 1997, 1999) took, if anything, an even stronger position. The same call for deregulation appears in the very title of one of the most recent entries into this literature, the IMF's Unemployment and Labor Market Institutions: Why Reforms Pay Off (2003). The empirical question appears to have been mainly whether the rigidity account is most strongly confirmed by modeling it as a problem of 1) the levels of institutional intervention (e.g., Layard, Nickell, and Jackman, 1991), 2) the interaction of 1970s-80s economic shocks with strong institutions (e.g., Blanchard and Wolfers, 2000), or 3) the change in institutional strength between the 1960s and 1990s (e.g., Nickell et al., 2002; IMF, 2003).

This paper extends our earlier assessment of the extent to which this literature's use of cross-country statistical evidence can reliably account for the pattern of unemployment across the developed world since the 1960s (Baker et al, 2003). In the next section, we briefly describe the unemployment experiences of the most economically developed OECD member countries. We then turn to the labour market institutions that have played starring roles as explanatory variables – unemployment benefits, employment protection laws, unions, coordinated bargaining, and labour taxes. We ask why labour market institutions designed to provide social protection might pose efficiency problems, and why they might, on the contrary, actually enhance efficiency. We then take a look at whether there is a simple statistical relationship between the standard measures of these institutions and the cross-country pattern of unemployment.

In Section 4 we evaluate the evidence that unemployment trends in the 1990s, including that of countries widely heralded as "success stories" can be explained by the reform (weakening) of labour market institutions. The final section summarizes our argument that the case for labour market reforms in order to reduce unemployment is not well founded empirically. We conclude with some comments on policy implications.

2. Unemployment and Institutions

While welfare state and industrial relations models vary widely across the developed countries, rising unemployment in the 1970s and 1980s afflicted almost all of them. For 15 European countries (the "EU 15"), unemployment grew from 5.5% in 1978 to 10.5% in 1984, and it stayed at about that level until 1998 – albeit with a dip to 8-9% between 1989-91. Figure 1 shows the levels and spread of unemployment rates for 20 OECD-member countries for each 5-year period between 1960 and 1999, and adds figures for 2000-02.

The top two rows of Table 1 show the recent (1998 and 2002) unemployment experience of OECD Europe and six individual countries: four large "high-unemployment" countries (France, Germany, Italy, and Spain), a leading "success story" (the Netherlands) and the "model" country (the U.S.).[1] The 1998 gap in performance is striking – while OECD Europe stood at 9.2% and France, Italy and Spain ranged from 11.5 to 15.4%, the Netherlands and U.S. were far below, in the 4.2-4.5% range. The data show strong improvements in employment performance across European countries between 1998 and 2002, leading to considerable convergence with the United States (which experienced an increase in unemployment to 5.8%). But a large gap between the four high-unemployment countries and the U.S. has remained, and the gaps are even larger with the Netherlands. The empirical question is: To what extent can these differences in unemployment (and their change over time) be explained by "bad" labour market institutions?

What Do Institutions Do?

The rest of Table 1 presents some commonly used measures of key institutions, most of which have been singled out as potentially "employment-unfriendly." Before turning to these data, it is worth reflecting on why these labour market institutions exist in the first place – even in the United States. Employment protection laws, union power, and bargaining coordination across firms and industries can reduce a firm's demand for workers and undermine workplace productivity. Generous unemployment benefits can raise workers' reservation wages and reduce job search. Labour taxes and government mandated active labour market policies may also raise labour costs and reduce hiring. If these components of the social protection system are too protective, poorly designed, or poorly matched with one another, they could have substantial negative effects on employment opportunities.

But there can be benefits as well, and it is notable that these are rarely mentioned in the unemployment-institutions literature. In fact, it is well-known that the case for a strongly regulated labour market has been made on efficiency as well as equity grounds. The Great Depression helped teach the lesson that too much inequality, economic insecurity, and lack of access by large parts of the population to basic needs such as food, health and safety,

[1] The OECD Jobs Study (1994) makes no major recommendation for reform of U.S. institutions, and the IMF (2003) explicitly uses the weakness of U.S. institutions as the benchmark for Europe. For example, as the IMF explains, "Across a range of structural indicators, the EU labor market continues to compare unfavorably to more competitive labor markets. For example, EU unemployment benefits and marginal effective tax rates on additional income are about twice as high as U.S. levels" (p. 139).

housing, and education can cripple economic efficiency. The case for a healthy, safe, decently housed, and adequately educated workforce – all of which requires some minimal level of income, which in turn requires employment and insurance against job loss - can be traced back to Alfred Marshall's Principles of Economics (1890) and even further back to Adam Smith's Wealth of Nations (1776).

In the last several decades there has been an increasing recognition that imperfect information and bargaining power are inherent to labour markets (Barr 1998; Agell 1999; Gregg and Manning, 1997). In real world labour markets, the right to join a union and bargain collectively can increase worker voice, encourage stability in industrial relations, promote on-the-job training, and reduce the pressure on taxpayers to maintain acceptable standards of living by placing the responsibility for decent income and benefits on the firm (and consumer). Co-ordination of bargaining, which would seem to push wage setting further from the competitive ideal, can cause the externalities from wage pressure to be internalized (Calmfors and Driffil 1999, Soskice 1990). The provision of unemployment insurance and assistance not only can help workers in time of need, but can facilitate job search, thereby potentially improving the match between jobs and worker skills and interests. As Agell (1999, p. 119) puts it, "the demand for risk-sharing institutions ought to increase with the fraction of the workforce that faces uncertainty about their future position in the wage distribution." From this perspective, the direction of causation runs mainly from uncertainty (unemployment) to response (institutions), whereas the thrust of the recent deregulation literature has this reversed. Indeed, even the IMF (2003, p.131), citing Blanchard (2002), notes that "it is generally agreed that 'the labor market will not function well without proper institutions,' that is, without an appropriate mix of regulations, taxes, and subsidies affecting the relation between workers and employers."

So the question boils down to whether countries facing high unemployment have the "appropriate mix" of labour market institutions. The IMF's view, shared by the authors of the OECD's *Jobs Study* reports and, in fact, by many economists, is that the U.S. has got the mix and levels of the key institutions about right (see footnote 1 above). As the IMF authors explain, leading international institutions – the IMF, OECD and the European Commission – have long argued that "the causes of unemployment can be found in labor market institutions. Accordingly, countries with high unemployment have been repeatedly urged to undertake comprehensive structural reforms to reduce 'labor market rigidities'" (IMF, 2003 129). Indeed, the IMF authors contend that "high and persistent unemployment can only be solved through structural reforms" (ibid. fn 8, 133). The problem with this view is the assumption that in the absence of protective labour market institutions, textbook-style competitive labour markets would prevail. As Gregg and Manning (1997 395) put it, the orthodox rigidity account reflects less a balanced assessment of the evidence than the "touching faith that many economists have in the view that the de-regulation of the labor market moves it towards the perfectly competitive ideal in which everyone who wants a job can find one at a wage equal to the value of their contribution to society."

For those who believe that labour markets are inherently and nontrivially imperfect, the solution must be the right mix of market pressures and protective labour market institutions. This "right mix" is likely to vary quite significantly across countries and regions. This position has been taken by a number of leading labour market specialists (Freeman 2000; Hall and Soskice, 2001). Recent country case study evidence strongly suggests that good employment outcomes in this new economic environment can be achieved with a variety of combinations of labour market institutions, with social spending far more generous in some countries than others (see Howell, forthcoming 2004). In sharp contrast, the orthodox rigidity account has pointed to the deregulated labour market of the U.S. as the model (e.g., see IMF, 2003).

The Measurement of Institutions

Before examining their relation to unemployment it is worth taking a brief look at the construction and quality of some of the standard measures of labour market institutions. After all, if empirical evidence is to be used to support a call for the deregulation, we should have confidence that the measure of the relevant institutions actually captures their essential features. The good news is that, largely through the work of the OECD, measurement quality has greatly improved for a number of the most frequently used variables.

For example, the measure of unemployment benefits duration that was employed extensively in the 1990s was an estimate of the number of years a representative unemployed worker was eligible for benefits. So, for example, Ireland was given a score of 4 (years), while France received 3, the Netherlands 2 and the U.S. just .5 (see Nickell, 1997, Table 4). In many studies, this measure of duration was found to be closely associated with higher unemployment, which lent support to the case for reduced generosity in length of benefits. But with the increasing recognition of the complexity of each nation's formula for eligibility (previous work experience, previous contributions by workers to the fund, and age), this duration measure has now been largely abandoned, having been replaced by a measure of the first year replacement rate or the ratio of the longer-term generosity of benefits to the one-year replacement rate (see below).

But the bad news is that even one of most carefully constructed measures, the commonly employed first-year replacement rate, almost certainly does not, by itself, provide a reliable measure of the overall generosity of the benefits system. First, the rules covering both eligibility and the duration of benefits are critical elements of the system, and the extent to which they are enforced will matter greatly. There is no cross-country measure of eligibility, but we do know that the share of the unemployed who are receiving unemployment-related benefits varies dramatically across countries.[2] As a measure of generosity, the replacement rate must be supplemented with the share of the unemployed eligible for benefits.

Second, a single average replacement rate may not capture very well the incentive effects of the rate structure. Thus, younger workers, who in many countries account for a large part of the unemployment problem and who may be most sensitive to work incentives, may be either ineligible for benefits in the first place (e.g., Italy) or may be eligible only for lower levels of benefits. For instance, in France in the mid-1990s, workers under 25 were eligible for full benefits for just 7 months, which these declined at 17% every 4 months thereafter for the next 23 months.

[2] One attempt was made by the OECD's *Jobs Study* (OECD, 1994, Table 8.4). Defining their measure as "all beneficiaries as a percentage of labor force survey unemployment" in 1991 (or for some countries, 1989 or 1990) France gets an "accessibility" score of 98 percent, which suggests a far more generous system than the U.S. (34%) or the U.K. (71%), but a less generous system than Austria (132%), Ireland (107%), or the Netherlands (105%) for example. These high scores (over 100%) reflect, among other things, the fact that some may qualify for benefits but not meet the official labor market survey definition of unemployment.

Third, as the OECD noted in *The Jobs Study* and has stressed since in their regular *Benefits and Wages* reports, if we are concerned with work-related incentive effects, we should use net (rather than gross) measures. These produce quite different replacement rate levels and cross-country rankings, since they take into account after-tax outcomes and include various related family and housing benefits. [3]

To take another example, the construction of the standard measure of the strictness of employment protection laws (EPL) has been particularly problematic. Like others, the IMF (2003) study used an EPL indicator taken directly from Nickell et. al. (2002), who in turn relied heavily on Blanchard and Wolfers (2000). The source of Blanchard and Wolfers' EPL measure was a major project on employment protection by the OECD (1999), which was and extraordinarily detailed and careful study, but provided only two data points for major OECD countries, one for "the late 1980s" and another for "the late 1990s." From these two OECD estimates for each country, Blanchard and Wolfers created another for 1990-94 by interpolating between the OECD's late 1980s and late 1990s scores, and still another for the early 1980s simply by using the late 1980s figures, on the grounds that they did not have information to suggest that there were any changes between the early and late 1980s. Thus, from two multi-year averages for the late 1980s and late 1990s (OECD), four 5-year averages were created (Blanchard and Wolfers), and from these, annual data points were created for 1980-95 (Nickell et al. 2002). To make matters even worse, the IMF's EPL data for the remainder of the period they examine (1961-79) comes from another source entirely, one that constructed this indicator on an entirely different basis, and which may be even more suspect. [4]

For the remainder of this paper, we use these same standard measures with some minor corrections. But it should be remembered that substantial questions remain about the quality and meaningfulness of the data, so even apparently strong results should be interpreted with caution.

Unemployment and Institutions: The Bivariate Evidence

The attempt to show that "employment-unfriendly" labour market institutions are largely, or even entirely, responsible for persistent high unemployment is a research program that took off in the 1990s, following the pioneering work of Layard, Nickell and Jackman (1991). Most of the analysis has taken a multivariate form: with country-level data, unemployment rates are regressed against measures of a number of different institutions and perhaps other factors. But there has also been frequent resort to bivariate evidence, often in the form of scatter plots. For example, Layard et. al. (1991) present a graph of long run unemployment against the duration of unemployment benefits (the first generation

[3] The OECD's first-year gross replacement rate (for single persons) puts France squarely among the most generous of the 28 OECD countries. France's replacement rate is 59, while the average rate is just 48, and 18 countries have less generous rates. But on the net measure, France provides almost exactly the average rate, with just 12 countries showing less generous (OECD, 2002, Tables 3.10 and 3.11).

[4] The IMF –via Nickell et. al. (2002) and Blanchard and Wolfers (2000) - use severance pay data from a paper by Edward Lazear for the 1960s and 1970s. Although they are chained together by Blanchard and Wolfers, they are almost certainly not at all comparable. For the late 1980s and late 1990s, the OECD (1999) carefully took into account three dimensions of employment protection: "procedural inconveniences which the employer faces when trying to dismiss; notice and severance pay provisions; and prevailing standards of and penalties for unfair dismissal." Further, their estimates were designed to cover both white and blue collar workers. In contrast, Lazear's index reflects just "severance pay, and months of advance notice before dismissal for blue-collar workers with 10 years of service."

measure discussed above), and imply a causal relationship from duration to unemployment: "It is noticeable… that all the countries where long-term unemployment has escalated have unemployment benefits of some kind that are available for a very long period, rather then running out after 6 months (as in the USA) or 14 months (as in Sweden)." We would note that there are other ways to interpret this rather thin evidence, but the point here is only that bivariate evidence has often been used to make the case for the unemployment-generating effects of labour market institutions.

The data on institutional arrangements in the OECD in recent years (Table 1) show a remarkable degree of diversity, with no immediately obvious connection between the levels of individual institutions and national unemployment rates. With respect to employment protection, for example, the data suggest that while EPL is modestly less strict in the Netherlands than it is in the four high-unemployment countries, Dutch EPL strictness is exactly equal to the average for OECD Europe, and is far higher than that of the United States despite reporting lower unemployment rates in both 1998 and 2002. Union density (the share of workers who are members of unions) is lowest in France and highest in Italy, both high unemployment countries. Unionization rates in the Netherlands are well below the OECD average, but on this score are not much different from Germany, which had far higher unemployment in 1998. It should be noted that on a related measure - workers covered by collective bargaining contracts (not shown in Table 1) - the country rankings look quite different. France, for example, has a high coverage score. On the degree to which wage bargaining involves coordination among employers on one side and unions on the other, Table 1 shows that the high unemployment countries fall between the highly coordinated, low unemployment Netherlands, and the highly atomistic low-unemployment United States.

Similarly, Table 1 shows that on the first-year unemployment benefit replacement rate, the large high-unemployment countries fall between the low-unemployment U.S. (28.5%) and the even lower-unemployment Netherlands (70.2%). The "duration" measure, perhaps better described as an index of longer-term replacement rate generosity, shows a wide range of values, from least generous in Italy to most generous in Germany. But it should also be noted that the Netherlands (62%) is much closer to the high unemployment countries (Germany, France and Spain) than it is to the U.S. (21%). On the other hand, countries with a relatively low tax wedge include high-unemployment Spain (45.8%) as well as low unemployment USA and Netherlands. Finally, on this measure of spending on active labour market policies (e.g., for training and job search programs), the two low-unemployment countries are again at the extremes of the distribution, ranging from three times (the Netherlands) the OECD-Europe average to just one-third of it (the U.S.).

Figures 2 through 8 show the simple, bivariate relationships more formally. These figures show scatter plots of unemployment against standard measures of the institutional variables for three 5-year periods and one 4-year period (1995-98) between 1980 and 1998. To say the least, the evidence is unsupportive of the conventional rigidity view. There is nothing approaching a significant cross-country relationship between unemployment and the extent of social protection (as measured by employment protection or the replacement rate) or the level of taxation. Similar plots for union density and bargaining coordination also show no statistical association with unemployment. Only a separate measure of active labour market policies "works," but in this case, more generous ALMPs are associated with *lower* unemployment.

Simple cross country plots can be compelling evidence when they show an unequivocal relationship, and by the same token, the absence of any obvious association between the two indicators should be disconcerting to those with a prior belief that a strong causal relationship exists between them. While bivariate relationships certainly vastly oversimplify the complex inter-relationships between labour market institutions, one robust conclusion that can be safely drawn from these figures is that almost any level of unemployment is consistent with almost *any* observed level of individual labour market institutions as they are currently measured. Countries with high levels of employment protection (Portugal), union density (Sweden), and unemployment benefits (Denmark), for example, can achieve quite low levels of unemployment. This suggests that countries have a menu of options, many of which will sustain low levels of unemployment, including regimes that provide substantial protections relative to the U.S. "ideal."

The empirical literature examining the connection between labour market institutions and unemployment has developed to include much more complex multivariate models that seek to uncover the importance of individual institutional variables whilst controlling for a wide range of other factors. We turn next to the evidence from these models.

3. Unemployment and Labour Market Institutions: the econometric evidence

An Update of the Cross-Country Literature

In an earlier paper (Baker et al. 2003) we examined in some detail the key studies that are cited to support the view that labour market rigidities lie at the heart of the unemployment problem. Before summarizing our main conclusions from that review, this section examines two new studies that build on this prior work: a study published by the OECD (Nicoletti and Scarpetta, 2002), which examines the interaction of labour market institutions and product market regulation, and a study by the IMF which attempts to explain the rise in unemployment over the last three decades by unfavorable trends in labour market institutions (IMF 2003). After examining the contribution of these new studies, the section reassesses the state of the cross-country literature.

Nicoletti and Scarpetta (2002)

Nicoletti and Scarpetta (NS) present an interesting departure in this literature. The paper attempts to merge an analysis of the impact of different types of product market regulation on employment, with a more conventional analysis of labour market protections. In the case of labour market outcomes, the argument is that product market regulations can lead to rigidities, which allow for rents in regulated sectors. These rents, in turn, can result in wage premiums for workers in these sectors, but will likely produce lower overall employment. [5]

NS find evidence consistent with the earlier literature and the view that product market regulation is associated with industry wage premiums. The evidence for this effect is clearer in the case of manufacturing industries than non-manufacturing industries. NS hypothesize that their ambiguous findings for non-manufacturing industries could be explained by the existence of a non-linear relationship, in which government regulators manage to limit wage premiums in the most heavily regulated industries.

[5] NS also examine the impact of labor market regulation on innovation and research and development spending.

For purposes of this discussion, the key question is whether the inclusion of measures of product market regulation strengthen or weaken the evidence linking labour market institutions to unemployment. NS test this hypothesis by running a series of cross-country panel regressions, using annual data for 1982-1998 that include a series of product market regulation variables, in addition to standard labour market variables.

One striking difference between the specification in this regression and the specifications in other studies is that this paper uses non-agricultural employment rates as its dependent variable. The decision to use non-agricultural employment rates, rather than overall employment to population ratios, is explained only briefly in a footnote (#10). Given the large differences in agricultural employment in these countries, and the fact that agricultural employment rates were changing during this period (and the declines may be correlated with changes in the institutional variables), there seems little justification for using the more narrow measure of employment rates[6].

Two regressions that exclude product market regulation variables find no significant relationship between the size of the tax wedge and the employment rate. However, the three published regressions that include product market regulation variables do find a significant negative relationship between the tax wedge and employment rates. The benefit replacement rate is insignificant in two of the five regressions and only significant at the 10 percent level in the other three. The implied effect in these regressions is relatively small, with a 10 percentage point increase in the benefit replacement rate associated with just a 0.6 percentage point decline in the employment rate. Since employment rates vary considerably more than unemployment rates, this would be equivalent to an approximately 0.3 percentage point rise in the unemployment rate. The union density and employment protection legislation variables are both significant in all the regressions and imply a meaningful economic impact. Overall, however, and bearing in mind their unconventional dependent variable, the NS results do not support a strong link between labour market regulation and unemployment. As NS notes: "the findings are only partly consistent with those of inter alia, Nickell and Layard (1999), Elmeskov et al. (1999), Nicoletti et al. (2001b) and OECD (1999b)."

The IMF (2003)

This study largely follows the framework laid out in Nickell et al. (2002), with some minor modifications. Like Nickell et al., it attempts to explain the differences across countries and changes over time in unemployment rates over the period 1960-98 by international differences and changes in institutions, rather than as the result of the interaction between shocks and institutions. Terms reflecting the impact of macro shocks are entered into the regressions separately, and are not interacted with the institutional variables. Like Nickell et al., the IMF also uses annual data. In addition, the IMF study also follows Nickell et al. by including country specific time trends in the regression.

[6] Perhaps the most singular aspect of these regressions is the inclusion of a public employment rate variable in the regression. This variable is highly significant in all five regressions and close to 1.0. The implication of this result is that countries that have a higher percentage of their population employed in the public sector have higher employment rates. Furthermore, the fact that the coefficient is not significantly different from one implies that there is no decline in private sector employment in response to an increase in public sector employment. This result implies that a country could increase its employment rate simply by increasing public sector employment or to put it another way that any adverse effects of high taxation on employment in the private sector would be offset if the taxation was spent to create public sector jobs.

While the basic approach is very similar to Nickell et al., there are some notable differences. First, in addition to using country specific time trends, the IMF also uses country specific terms for the inflation-unemployment trade-off. In other words, unlike prior studies, this one does not impose the restriction that the trade-off between inflation and unemployment is identical for all countries. In another departure from most prior research, the study does not include a benefit duration variable.[7] The IMF also includes somewhat novel specifications for the standard set of institutional variables. Specifically, the regressions include a quadratic term for bargaining coordination.[8] This allows for the possibility that the effect of bargaining coordination on unemployment may not be linear. It also includes (like Nickell et al.) a lagged dependent variable. However, the IMF study also separately includes interaction terms for the lagged unemployment rate multiplied by the benefit replacement rate and the lagged unemployment rate multiplied with the bargaining coordination level. In principle, these additional variables are included to allow for the possibility that these institutions affect the persistence of unemployment through time.

The one other noteworthy departure of the specifications used by the IMF is the inclusion of a variable for central bank independence. This allows for the possibility that independent monetary policy may either lead to higher unemployment – possibly as a result of shielding central bankers from political pressures to try to reduce unemployment – or alternatively, to lower unemployment as a result of consistent well-planned monetary policy. The regressions with the central bank independence term also include an interaction term between central bank independence and bargaining coordination. This allows for the possibility that the effect of central bank independence may depend on the extent of coordination in wage bargaining.

The study's authors describe their results as providing compelling evidence that weakening labour market institutions will lead to lower unemployment: "comprehensive and procompetitive reforms can generate substantial gains" (p 129). But it is not obvious that their evidence unambiguously supports such a claim. At the most basic level, the four sets of regression coefficients published in the study (Table 4.3) show substantial differences in the estimated effects of the institutional variables, some of which are directly at odds with the claim that labour institutions promote unemployment. Table 2 shows the implied impact of particular changes in labour market institutions for each of these specifications.[9]

For example, the column 1 results from the IMF's table 4.3 imply that the impact of employment protection is almost three times as large as the results shown in the third column, whereas the results shown in the fourth column actually imply that increased employment protection leads to lower unemployment. Similarly, the published results shown in the first column imply that an increase in the tax wedge will lead to a substantial increase in the unemployment rate, whereas the results shown in column three imply that an increase in the tax wedge will lead to a drop in the unemployment rate. Increases in bargaining coordination, at levels below the mean level of coordination, are found to

[7] This is explained by the difficulty in obtaining recent data on benefit duration, which is surprising since it is regularly updated by the OECD.

[8] Calmfors and Driffill (1988) and others have posited the existence of a nonlinear relationship, but earlier literature in the style of the IMF paper has generally not included a quadratic term for centralized bargaining.

[9] The IMF states that all four specifications are reasonable representations of reality. For example, the IMF writes that "the very simple model [in variant one] does a good job in explaining unemployment variation across countries (although not across time)." (p. 148) The IMF's preferred specification is arguably variant three, but this equation includes complicated interactions between institutions and the lagged dependent variable that make it difficult to use in various simulation exercises. Variant four is based on variant three, but without these interaction terms.

substantially reduce unemployment in the regression results shown in the first column, and to lead to more modest reductions in the results shown in second and third columns, while the results shown in the fourth column (the one used for the simulations in the paper) imply that higher levels of bargaining coordination have a very small positive effect on the unemployment rate. The implied impact of changes in union density has the same sign in all four sets of regression results, but the magnitude of the implied impact varies substantially. The results from the regression shown in column 2 imply an impact of changes in union density that is nearly twenty times as large as the results from the regression in column four. Only the coefficients for the replacement rate variable are roughly similar across the four regressions.

There are two other striking aspects of the results of the IMF study. The large positive coefficient found on the quadratic bargaining coordination term, coupled with the negative coefficients on the linear terms, imply that the lowest levels of unemployment will be associated with medium levels of coordination, and that very high levels of coordination will lead to high unemployment. This result contrasts with a significant body of literature which has generally assumed that greater bargaining co-ordination (as distinct from centralization – see Soskice (1990)) would lead to improved employment outcomes.[10]

Another striking finding is that greater central bank independence, in the presence of low rates of bargaining coordination, leads to higher unemployment. For example, the regression results in the third column imply that in the United States, which has a measure of 1.0 on the bargaining coordination index, a one standard deviation increase in the measure of central bank independence would lead to a 1.44 percentage point increase in the unemployment rate. If the results in these regressions are taken at face value, then they imply that a simple method of lowering unemployment in the United States and other countries with limited bargaining coordination is to reduce the political independence of the central bank. (This finding is consistent across the three sets of regression results that include a central bank independence variable.)

However, there are reasons to question whether these regression results should be taken at face value. As noted earlier, three of the four published regressions follow the methodology in Nickell et al. of including country specific time trends.[11] This appears to be even more problematic in this set of regressions as some of the estimated coefficients are both large and highly significant. For example, a re-estimation of the regression shown in column three (the preferred regression in IMF (2003)) found that Sweden had a time

[10] The IMF includes a warning against extrapolating results based on panel regressions using measures of national coordination to coordination at the level of the euro area (footnote 13). This warning seems misplaced. While it may be politically more difficult to achieve coordination across the euro zone than within a nation, presumably the economic effects of a given level of coordination would be the similar. In other words, there is no reason to believe that the economic forces affecting labor markets operate differently in the euro zone taken as a whole, than they would in any individual nation.

[11] This discussion relies on the estimated coefficients in our replications of the IMF regressions. The study does not publish its estimates for country specific time trends, country specific inflation terms, or country dummies.

trend of 0.998 annually. Due to the presence of the lagged dependent variables, a time trend of this size implies that Sweden would have seen an increase of 16 percentage points in its unemployment rate over this period, as a result of factors that are beyond the scope of the analysis. (This increase is at least partially offset by the fact that the estimated value of the country dummy for Sweden is -69.4, implying that factors specific to Sweden lower its unemployment rate by 69.4 percentage points relative to the OECD average.)

There is one final point worth noting about the methodology by the IMF. Our earlier assessment (Baker et al 2003) of Nickell et al. (2002) noted the questionable merits of using annual data, given both the expected lags involved in the impact of institutional changes, and the fact that annual data did not exist for many of these institutions in any case (the annual data are constructed by interpolating). The IMF methodology is vulnerable to this same criticism, although it compounds the problem by including a lagged bargaining coordination variable (one of the interpolated variables) in two sets of published regression results. While the coefficients of these variables are both highly significant, given the nature of the data, it is difficult to have much confidence in these estimates.

In conclusion, the IMF study does not provide much evidence to support the labour market institutions explanation for unemployment. Contrary to the discussion in the text, there are important differences in the estimates across regressions. Furthermore, there are serious methodological problems – most notably implausible estimated values for country specific time trends, country specific dummies, and country specific inflation terms – that further suggest that the IMF results are unreliable.

Assessment

Our prior assessment of this literature led us to question the extent to which it supported the view that labour market rigidities were the primary cause of high unemployment in the 1980-90s. These two additional studies provide little reason to change this earlier assessment. Table 3, which extends the results reported in Baker et al (2003), shows the implied impacts of specified changes in each of the labour market institutions, based on the regression results from six prior studies and the two additional studies discussed in this section.[12] Following the approach in Baker et al. we focus only on the most supportive results (for the rigidity view) from each study.

Our earlier assessment noted the fact that the coefficients of the labour market institution variables were not always significant, and even when they were, they took widely differing values. The results from these two additional studies reinforce this assessment. Their findings are not entirely consistent with the prior research and increase the already wide range of estimates found in this literature.

For example, while the preferred regression in the IMF study finds that increasing the tax wedge actually lowers the unemployment rate, the tax rate variable was the only labour market institution variable in the prior studies which consistently had a significant positive coefficient. The coefficients on the employment protection legislation variable are

[12] The appendix table in Baker et al. (2003) describes the construction of the variables in each set of regressions.

consistently positive and significant, but the implied effects on unemployment differ substantially. The same is true of the union density variable, although most of the prior studies examined found that union density either had no effect or even a negative effect on the unemployment rate (Belot and Van Ours 2002, for example). The coefficient for the replacement rate variables is both positive and highly significant, although the size of the estimated effect is substantially smaller than in most earlier research.

This mixed evidence is consistent with our prior assessment and suggests three main conclusions:

1. The wide range of coefficient estimates for the labour market institution variables does not provide compelling evidence linking these institutions to unemployment. In many cases, these coefficients are insignificant even in the preferred regression within a study. In the cases where the coefficients are generally significant (e.g. the replacement rate or tax wedge variables), the range of estimates is so large that it raises questions about the credibility of the results and particularly to undermine their usefulness for policy. Where trade-offs are involved, policy makers need to know more than just the sign of a coefficient; they must also have a reasonable estimate of the expected economic impact of a policy change.

2. Some of the explanatory power of these regressions is attributable to the positive impact of "good" labour market institutions. The new studies provided limited evidence to reinforce this conclusion. The NS study excludes both active labour market policy and bargaining coordination variables. The IMF study includes a bargaining coordination variable, but not an indicator for active labour market policies. Three of the IMF's four published sets of regression results, but not the fourth one used in the IMF's policy simulations, imply greater bargaining coordination will lead to lower rates of unemployment. This is curious because the beneficial effects of bargaining coordination on unemployment are perhaps the most robust finding in this literature.

3. The NS and IMF studies contribute new concerns to the list noted in Baker et al. In the case of NS, the use of the non-agricultural employment to population ratio, instead of the overall employment to population ratio, seems difficult to justify given the set of countries and time-period under examination. Also, the finding that increased public sector employment increases total employment almost one to one is somewhat unusual. In the case of the IMF, the use of country specific time trends (following Nickell et al.) is troubling, especially since the economic importance of the estimated value of these trends is quite large. The fact that this study also includes country specific inflation terms, and finds implausibly large effects, provides further grounds for concern.

In our prior assessment, we concluded by citing Blanchard and Wolfers (2000) on the possibility that the selection of variables and specifications was influenced by the desire to obtain certain results:

> "One must worry however that these results are in part the result of economic Darwinism. The measures used by Nickell have all been constructed ex-post facto, by researchers who were not unaware of unemployment developments. When constructing a measure of employment protection for Spain, it is hard to forget that unemployment in Spain is very high … Also, given the complexity in measuring institutions, measures which do well in explaining unemployment have survived better than those that did not." (p18)

Our assessment of these two new studies suggests that this warning is still well taken.

4. The Pay-Off to Labour Market Reforms

The analysis of the impact of labour market institutions on unemployment is frequently taken to justify the advocacy of comprehensive labour market deregulation in Europe. In this section we derive from the OECD's comprehensive assembly and classification of reforms, an indicator of the "volume" of labour market reforms carried out by individual OECD countries in the 1990s and compare this to the OECD's own estimates of the decline in structural unemployment over the 1990s. Next we briefly examine two of the spectacular examples of labour market improvement since the mid-1980s –Ireland and Netherlands--to see what light they throw on the role of reforms.

The Effects of Structural Reform

The approach adopted in the IMF study mentioned earlier was to simulate the impact of policy changes on the basis of the estimated effect on unemployment of the relevant policy variables. An alternative approach is to examine directly the labour market reform packages which have been implemented and then compare them to unemployment outcomes. The most comprehensive enumeration of reforms was carried out by the OECD as part of its follow-up program on *Implementing the Jobs Strategy*. Their 1999 survey provide an extremely comprehensive and careful listing of changes in unemployment benefits, EPL, minimum wages and the like, focused on the period from 1995 but with summary data from the earlier 1990s. The OECD listed all the reforms suggested for each country in its labour market reviews, developed a weighting system for assessing their significance, and then analyzed whether the reform had been fully implemented, partially implemented, ignored, or even flouted in the sense that policy had moved in the "wrong" direction.

The OECD then constructed a measure showing the degree to which countries had followed their suggestions (so for example, one policy proposal fully adopted, one policy partially adopted (counting as 50%) and one ignored would count as an average "follow-through" rate of 50% - assuming the three policies were of equal significance). The OECD found a significant positive relation between this index of compliance and the extent to which the NAIRU fell in the 1990s (1999 figure 2.7). But such a measure ignores the very different number of suggestions for labour market reforms that countries received from the OECD (varying from 4 in the case of USA and Australia to 21 for Finland and 23 for Germany). The effect of reforms on unemployment should presumably depend on how many were implemented, not simply the *proportion* of OECD suggestions which were followed. Accordingly we constructed an alternative index showing the "volume" of reforms carried out, which is in effect the OECD's compliance rate multiplied by the number of reforms advocated by the OECD (see Data Appendix which describes the weighting system used to reflect the significance of the various types of reform measures). We limited our index to reforms connected with the benefit system, employment protection and wage bargaining as these constitute the core of the program for Labor Market Deregulation (see the Appendix).[13]

[13] The Fondazione Debeneditti has also assembled a mass of information on European Labor Market reforms which covers the period from 1985 onwards (see Bertola and Boeri 2002): some simple experiments using an index of reforms based on a crude count of reforms from this dataset yielded a similar conclusion of no strong relationship with NAIRU changes.

Figure 9 below compares this index of labour market deregulation in the 1990s with the OECD's own estimate of change in the NAIRU over the same period. It is clear that there is no significant relationship between these measures of deregulation and the change in unemployment across OECD countries (the t value from a regression is 0.3). Obviously Ireland is an extreme case with the most dramatic fall in the NAIRU accompanied by rather little labour market reform. However even if Ireland is excluded the impact of reforms on structural unemployment still appears very weak (t value of 1.3, significant only at the 20 per cent level and with only about one tenth of the variance in the NAIRU change being "explained"). It appears that the changes in structural unemployment which have occurred in the 1990s are not closely linked to the extent of labour market reform.

Two Success stories – Netherlands and Ireland

Netherlands and Ireland are two outstanding success stories in European unemployment experience since the mid-1980s. The OECD suggested in the mid-1990s that the Netherlands pursue a large number of "reforms" to labour market institutions. Analysis of the Dutch response is striking. Some of the OECD's recommendations have been partially or fully carried out (including tightening conditions for receipt of unemployment benefits and sickness benefits and relaxation of restrictions on fixed term contracts and use of agency labour) so that the Netherlands scores quite highly in terms of the extent of labour market reforms (see figure above). But other OECD recommendations, notably cutting benefit replacement rates and duration and modifications to the minimum wage and the system of extending collective agreements, were not acted on (see OECD 1999). In any case, leading contributors to the debate on European unemployment are quite clear that the most important factor behind the decline in Dutch unemployment has been the wage bargaining system:

> "…in the case of the Netherlands, much informal evidence points to a change in the attitudes of unions as the main factor behind wage moderation: By the early 1980s, the large increase in unemployment led to a national agreement, known as the Wassenaar agreement, in which the unions recognized the need for wage moderation in exchange for a number of concessions from both firms and the state (in particular more generous early retirements and a shorter workweek.) Most observers agree that this agreement played a major role in the reduction of unemployment" (Blanchard and Philippon 2003, p. 27).

This echoes the conclusion of Nickell and van Ours (2000, p. 173), "Since 1983, the unions in the Netherlands have been very co-operative and they operate within a highly co-ordinated wage bargaining system. As a consequence when the labour market becomes tight, there is no excessive upward pressure on wages and this enables a low level of unemployment to be maintained".

Ireland has shown an even more spectacular decline in the NAIRU since the late 1980s than the Netherlands (see Figures 1 and 9). That the early years of expansion could be achieved without much inflationary pressure was not so surprising – unemployment was still very high and additional labour supply was available from the UK (see Blanchard's comment on Honahan and Walsh 2002). However, the continuation of wage moderation after unemployment had fallen sharply has been more surprising and it seems highly likely that the series of co-ordinated social partnership agreements, involving very modest pay increases in return for some tax cuts played a strong supporting role. The outcome was a very slow rate of increase of real wages (hardly more than 1% per year) despite very rapid increase in productivity. This wage moderation was the more striking since profitability was pushed to very high levels as relative unit labour costs *halved* as compared to Ireland's competitors (see Glyn 2003 for more discussion). Honahan and Walsh's authoritative study notes that "most observers regard the coincidence of timing of the reversal of the deteriorating trend in competitiveness with the new approach to pay bargaining as suggestive that the latter did pay dividends" (2002 p 33) and they suggest that the agreements were one of the key elements in the Irish boom. Even the OECD noted in its

1997 Economic Survey of Ireland that "The central wage agreements have helped to reduce industrial unrest; the number of days lost to labour disputes was the lowest since 1923. Moreover, they may have had a positive effect in moderating pay settlements during a period of rapid growth" (p.91).

Ireland had a relatively deregulated labour market to begin with and the OECD did not call for many labour market reforms. Those that were carried through could not possibly explain the huge fall in the NAIRU. Honahan and Walsh report that "there was no radical reform of the Irish welfare system in the 1990s to which the dramatic improvement in the labor market can be attributed" (p. 35). The Dutch and Irish cases suggest that a significant role should be assigned to the co-ordination of bargaining for sustaining the fall in unemployment in the context of a very strong boom. They also suggest that structural reforms of the labour market of the orthodox type played very little role.

5. Conclusion

The rise in the unemployment rate in many countries over the last three decades is probably the most striking economic phenomenon of recent decades. Economists have struggled to find a compelling explanation for this development. There is a great temptation, especially for economists, to blame labour market protection – it is generally believed that interferences with smooth market adjustments will produce less than optimal outcomes. It is, therefore, understandable that the conventional wisdom has been that the villains in this story are protective labour market institutions such as employment protection legislation, unemployment benefit generosity, and labour unions.

This paper critically assesses some of the leading evidence employed as support for this labour market rigidity account. Expanding on an earlier review of recent literature, we find that the results of prior studies are in many cases problematic and often contradictory. Many of the results that report significant relationships between unemployment and labour market institutions appear dubious – for example finding large country specific trends in unemployment rates – which would preclude the regression results from being taken literally in other contexts. The extraordinarily wide range of estimates of the economic impact of the labour market institutions undermines their usefulness for policy purposes, even when the measured effects are found to be statistically significant. In order to intelligently assess the merits of labour market reform, policy makers need a fairly precise range of estimates of the unemployment-reducing benefits to be expected from weakening specific labour market institutions. These benefits can then be weighed against the costs, both in the form of reduced security for workers and reduced labour-market efficiency. In our view, this extensive literature clearly does not provide the basis for such a benefit-cost assessment. In sharp contrast, it has become commonplace to use these results as the rationale for deregulating the labour market and rolling back the welfare state.

Furthermore, our general skepticism regarding the quality of the data as well as our own efforts at analyzing them strongly suggests that these cross-country results are highly unreliable. At the most basic level, it is apparent in bivariate regressions that there is no simple relationship between any of the labour market institutions and the unemployment rate. While it is possible to construct multivariate regressions that find significant relationships between various labour market institutions and the unemployment rate, it is also easy to construct equally plausible regressions that do not. In short, the econometric evidence on this issue is at best inconclusive. It is certainly not the sort of evidence that governments should use for making public policy.

A large part of the empirical problem in this literature may be the difficulty of adequately measuring the relevant labour-market institutions. Many of the academic researchers cited here, together with the OECD and ILO, have made important contributions to improving such measures, but much work remains to be done. Labour markets and the institutions that shape and regulate them are highly complex. Quantitative measures that will be useful enough to shed light on the real-world workings of key labour-market institutions will have to be sufficiently standardized to be meaningful across countries, yet flexible enough to factor in important national differences. Balancing such considerations will not be easy and will undoubtedly involve creation of multidimensional measures of labour-market institutions. Some of the necessary advances can come from ongoing improvements within and continued coordination across national statistical agencies. Some of the needed progress, however, will only come from greater investment in data gathering, analysis, and dissemination.

This review of the literature and the recent sharp convergence in unemployment rates across OECD nations strongly suggests that there is not a single path to successful employment performance. Countries with very different institutional frameworks have managed to achieve unemployment rates substantially below the OECD average. While the United States and United Kingdom stand out as countries that have achieved low rates of unemployment with relatively weak labour market protections, the OECD also includes examples of countries that have achieved comparable results – Austria, Denmark, Ireland, Netherlands, Norway, and Sweden – with quite high levels of labour-market protection. A complete and convincing analysis of the relationship between labour-market institutions and employment performance must explain the success of these more-regulated countries as well.

One result that appears relatively robust throughout much of the literature on labour-market institutions and unemployment, including detailed analysis of individual countries, is that the nature of bargaining coordination can have a substantial impact on the unemployment rate. Research on the link between bargaining coordination and unemployment, in particular research on how policy can exploit the beneficial effects of bargaining coordination in low bargaining coordination countries, seems like an especially fruitful area for further research. As noted above, even if reducing labour-market protections can be shown to lower unemployment, such a course of action may still entail substantial costs to workers, their families and their communities, and before major structural reforms are adopted attention should be paid to the longer run net benefits. Increasing bargaining coordination, in contrast, may allow for lower unemployment without the same welfare costs for workers.

Our assessment of the evidence is that it does not support the conventional view that high-unemployment countries should restructure their labour-market institutions along the lines of the US model. Before the late 1980s, many countries with highly regulated labour markets had unemployment rates well below U.S. levels, and since the late 1990s many countries have shown greatly improved employment performance without significant labour market deregulation. What this evidence does not suggest is that there is a single model that guarantees successful employment performance.

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Tables and Figures

Table 1: Summary of labour market institutions, 1998

	OECD Europe	France	Germany	Italy	Spain	Nether-lands	United States
Unemployment (1998)	9.2	11.5	8.9	11.9	15.4	4.2	4.5
Unemployment (2002)	7.0	8.8	8.6	9.0	11.3	2.8	5.8
Employment protection	1.22	1.50	1.41	1.41	1.62	1.23	0.10
Union density	29.6	10.1	24.3	37.3	18.0	20.0	13.9
Bargaining coordination	2.01	1.70	2.50	2.30	2.00	3.00	1.00
Benefits							
Replacement rate	45.9	58.5	35.6	43.4	63.5	70.2	28.5
Duration	0.541	0.465	0.763	0.033	0.290	0.616	0.214
Labour tax wedge	55.7	69.0	51.5	69.3	45.8	47.0	48.9
Active labour market policies	0.127	0.113	0.141	0.094	0.045	0.382	0.039

Notes: Standardized unemployment rates for 2002 from OECD, www.oecd.org; remainder of data from authors' analysis of IMF labour-market-institutions data base, with minor modifications described in Appendix. Unemployment is percent of labour force. Employment protection is an index from 0 to 2, with higher numbers indicating greater protections. Union density is the percent of employed workers who are members of unions. Bargaining coordination is an index ranging from 1 to 3, with 3 indicating the greatest degree of coordination. The benefit replacement ratio is the average first-year unemployment benefit level as a percentage of average before-tax earnings. Benefit duration is an index ranging from zero to one (calculated as a weighted-average of the ratio of the average benefit levels at the during the second, third, and fourth years of unemployment to the average benefit level during the first year of unemployment). The tax wedge is the sum, in percent terms, of the employment tax rate, the direct tax rate, and the indirect tax rate. Active labour market policies are measured as the share of GDP spent on ALMPs per percentage point of unemployment. All figures for OECD Europe are labour force-weighted averages.

Table 2: The implied effect of labour market changes on the unemployment rate in IMF 2003

	Regression Number			
	I	II	III	IV
Employment Protection index (+1 unit)	1.47	0.30	0.52	-0.44
Replacement Rate (+10 PP)	0.68	0.53	0.51	0.57
Union Density (+10 PP)	1.57	3.90	2.37	0.21
Bargaining Coordination Index (+1 unit)	-2.46	-0.48	-0.27	0.01
Tax Wedge (+10 PP)	2.66	0.67	-0.51	1.12

Source: IMF 2003 and authors' calculations. These calculations use the published regression results in IMF 2003, Table 4-3. The estimated impact for interacted variables assumes that the interacted variable has the mean value for the OECD nations for 1998. The calculation for the impact of a one unit increase in bargaining coordination assumes that the index rises from 0.5 units below the mean to 0.5 units above the mean.

Table 3: Summary of the implied impacts of differences in labour market institutions on unemployment

	Nickell 1997[a]	Elmeskov 1998[b]	Belot &VO 2002[c]	Nickell et al 2001	Blanchard / Wolfers 2000	Bertola et al 2001	Nicoletti/ Scarpetta 2002[d]	IMF 2003
Institutions								
EPL (1 unit increase)	No effect	1.43	0.87	4.45	0.24	0.20	0.91	0.52
UB Repl. Ratio (+ 10 PP)	0.88	1.29	0.10	1.24	0.70	No effect	0.30	0.51
UB Duration + 1 yr	0.70	--	--	0.88[e]	1.27	1.43	--	--
ALMP + 10 PP	-1.92	-1.47	--	--	No effect	No effect	--	--
Union Density +10 PP	0.96	No effect	-1.06	No effect	0.84	No effect	1.00	2.37
Union Coverage +10 PP	3.60[f]	--	--	--	No effect	No effect	--	--
Co-ordination + 1 unit	-3.68	-1.48[g]	-0.70	-11.64	-1.13	-1.11	--	-0.27[h]
Taxes + 10 PP	+2.08	0.94	1.79	1.69	0.91	0.97	0.8	-0.51[i]

Notes: Column (1) is based on Nickell 1998, Table 2: column 1; Column (2): Elmeskov et.al 1998, table 2 column 1; Column (3): Belot and Van Ours 2002, Table 7, column 5; Column (4): Nickell et al 2001, Table 13, column 1; Column (5): Blanchard and Wolfers, 1999, Table 5, column 1; Column (6): Bertola et al 2001, Table 9, column 1; Column (7): Nicoletti/ Scarpetta 2002, Table 5.1 column 6; Column (8): Debrun et. al 2003, Table 4.3, column 3. "No effect" means not statistically significant; -- means variable not included in regression.

[a] Shows the impact of differences in the independent variable on a country with the mean unemployment rate for the sample. [b] Shows impact of a change of one standard deviation in the independent variables.

[c] The calculation of the change in EPL assumes a 10 unit increase in the index. Effects shown include the effect of the interaction terms, under the assumption that that the interacted institutional variable is set at the sample mean for the last period. [d] The dependent variable in this regression is the percent of the population employed in the non-agricultural sector. To make these results more comparable to the results shown in the other regressions, the negative of the implied effect on the employment rate is divided by two (e.g. an implied increase in the employment rate of two percentage points is assumed to be equivalent to a reduction in the unemployment rate of one percentage point.) [e] Assumes an increase of 0.12 in the duration index, which is equivalent to adding an additional year of benefits at a replacement rate of 40 percent. [f] Assumes a rise of one unit in an index that ranges from 1 to 3. [g] The effect of being a country with either a low or high degree of coordination and centralization, compared to a country with intermediate levels for these measures. [h] Since the bargaining coordination variable is entered into this regression with a quadratic term, in order to best reflect the impact of these hypothetical changes on a typical country, it is assumed that an increase in the measure of bargaining coordination is from 0.5 units below the mean to 0.5 units above the mean. [i] This number is extremely sensitive to rounding. The implied effects based on the coefficients we found in our re-estimation of this equation, rather than the published results, is an increase of 0.29 percentage points.

Figure 1

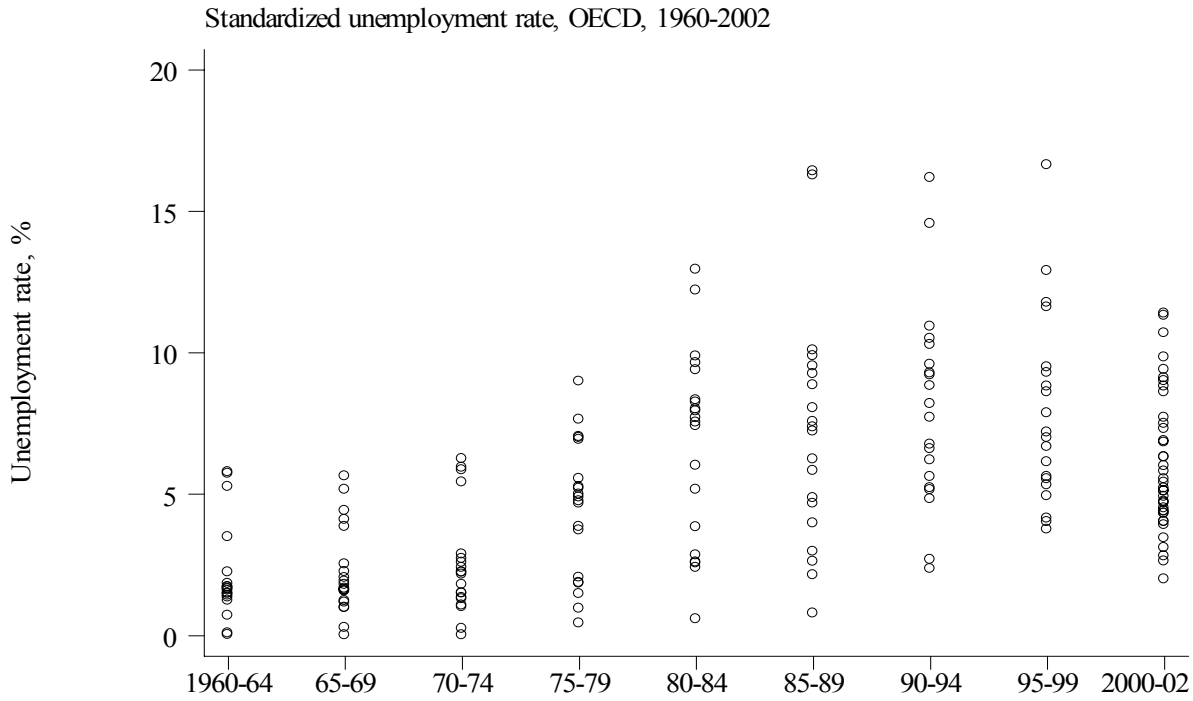


Figure 2

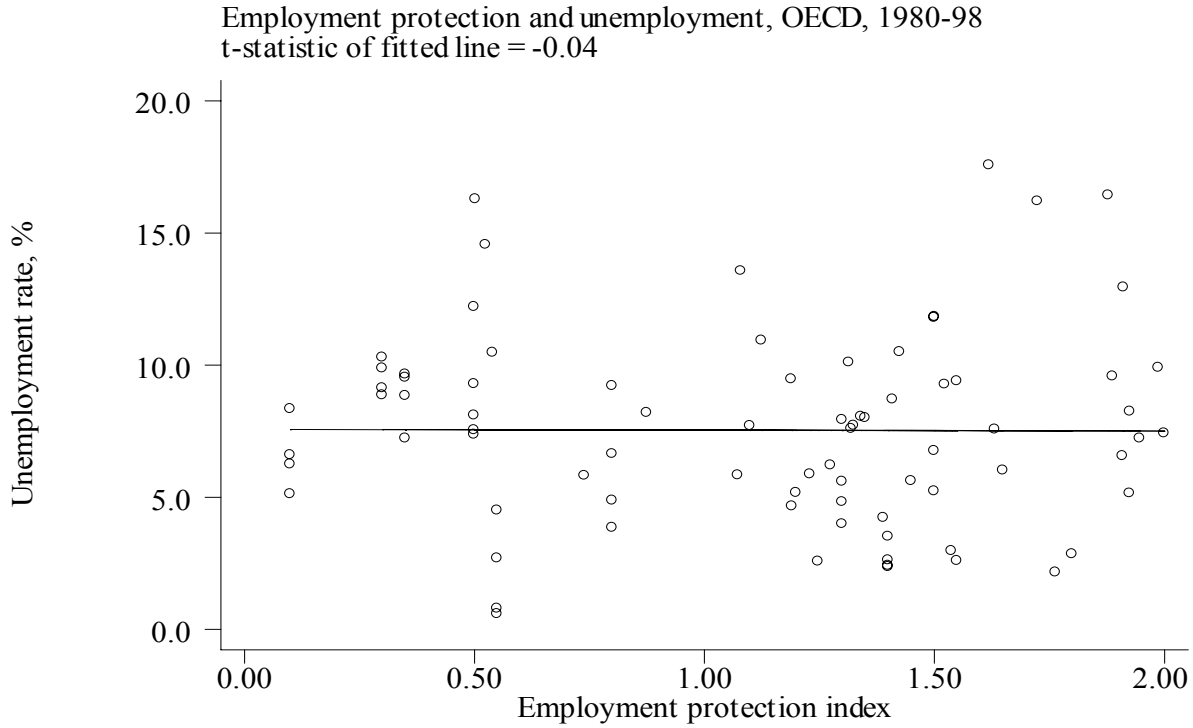


Figure 3

Figure 4

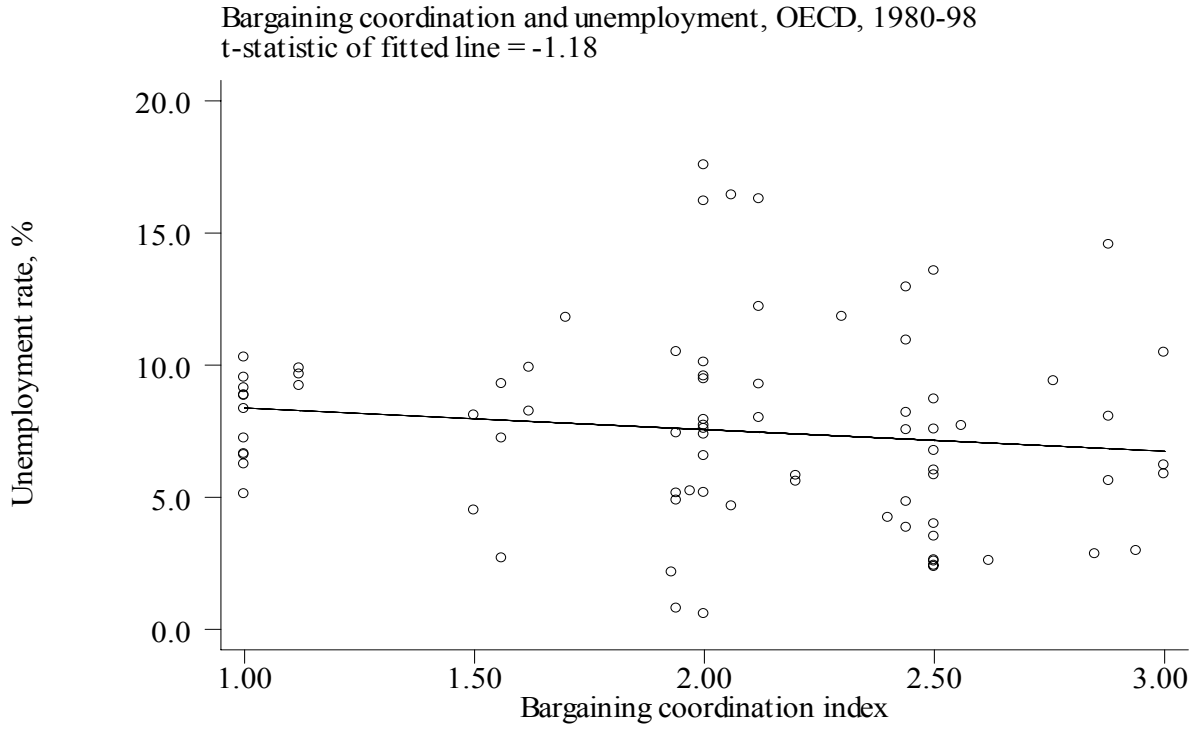


Figure 5

Figure 6

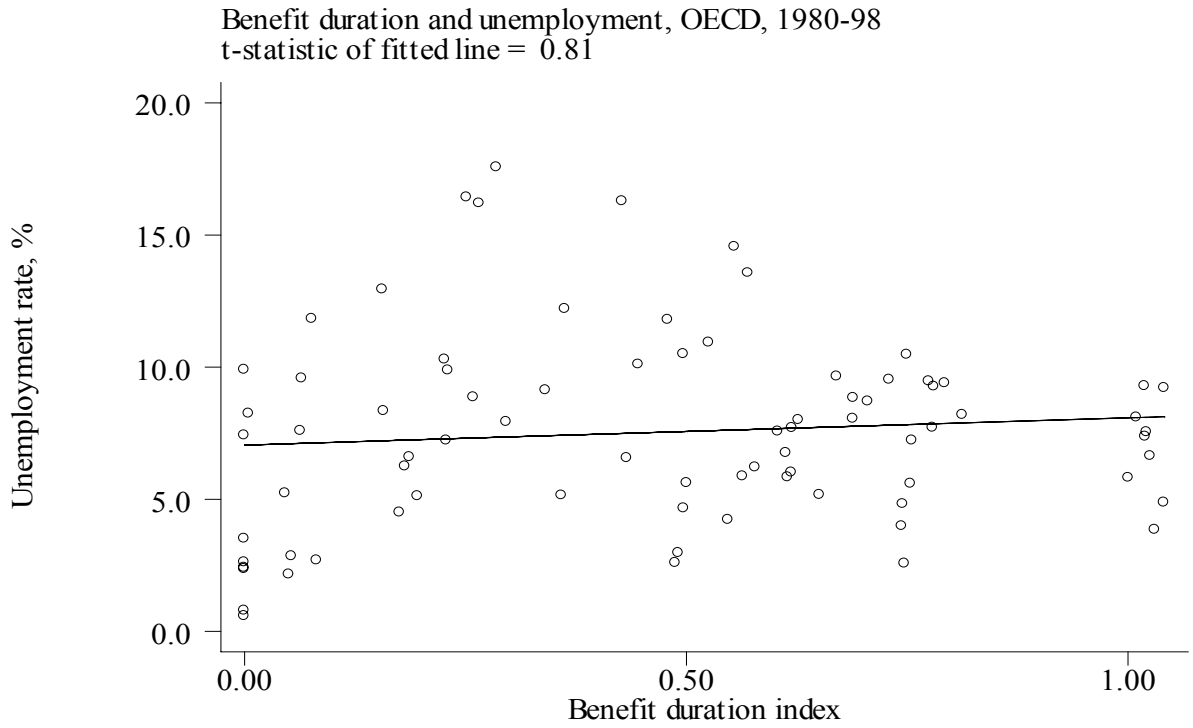


Figure 7

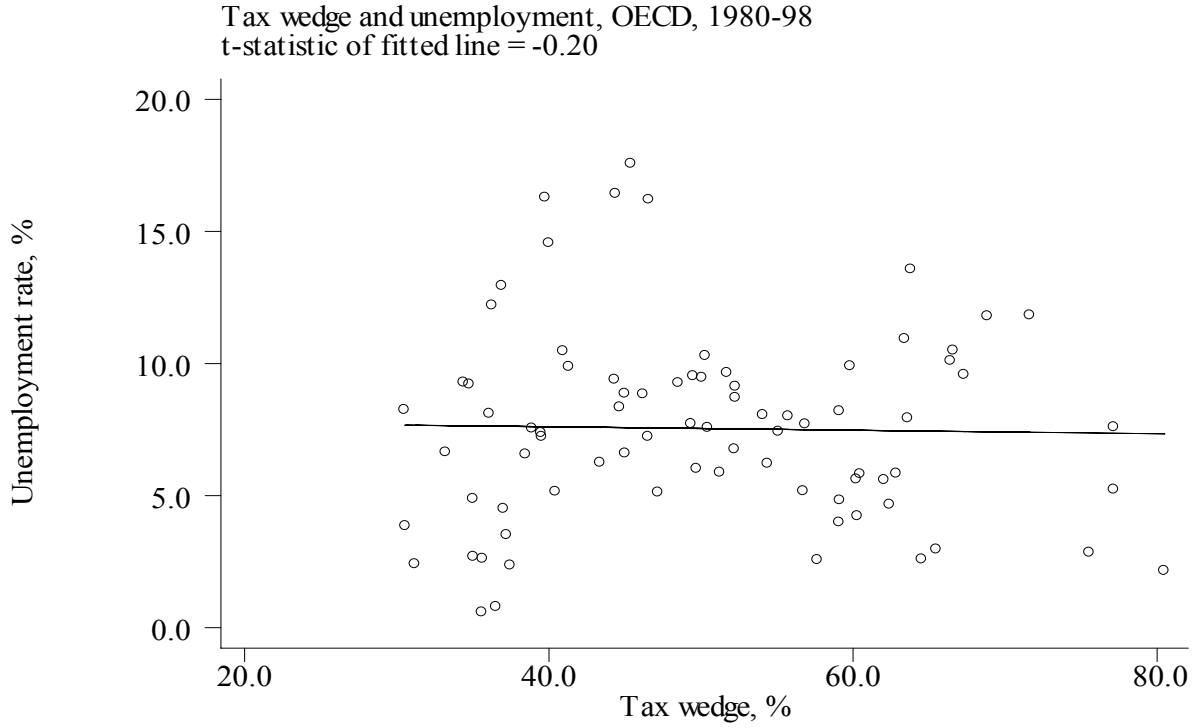


Figure 8

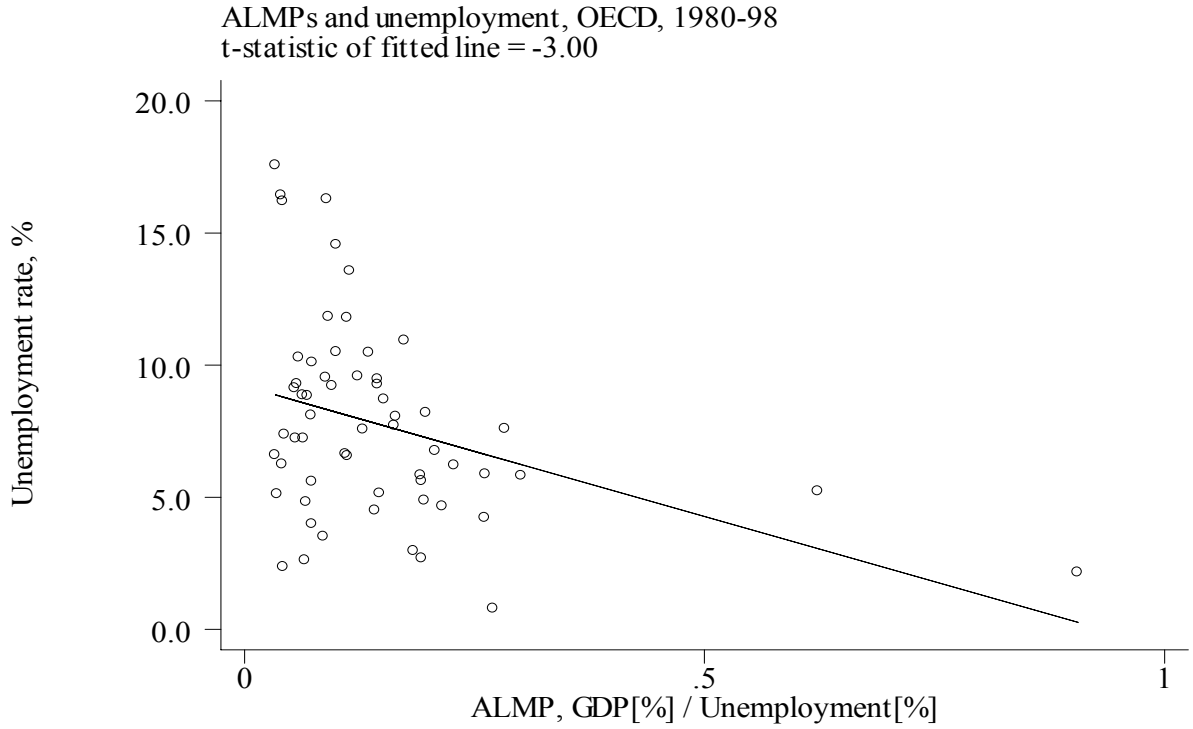
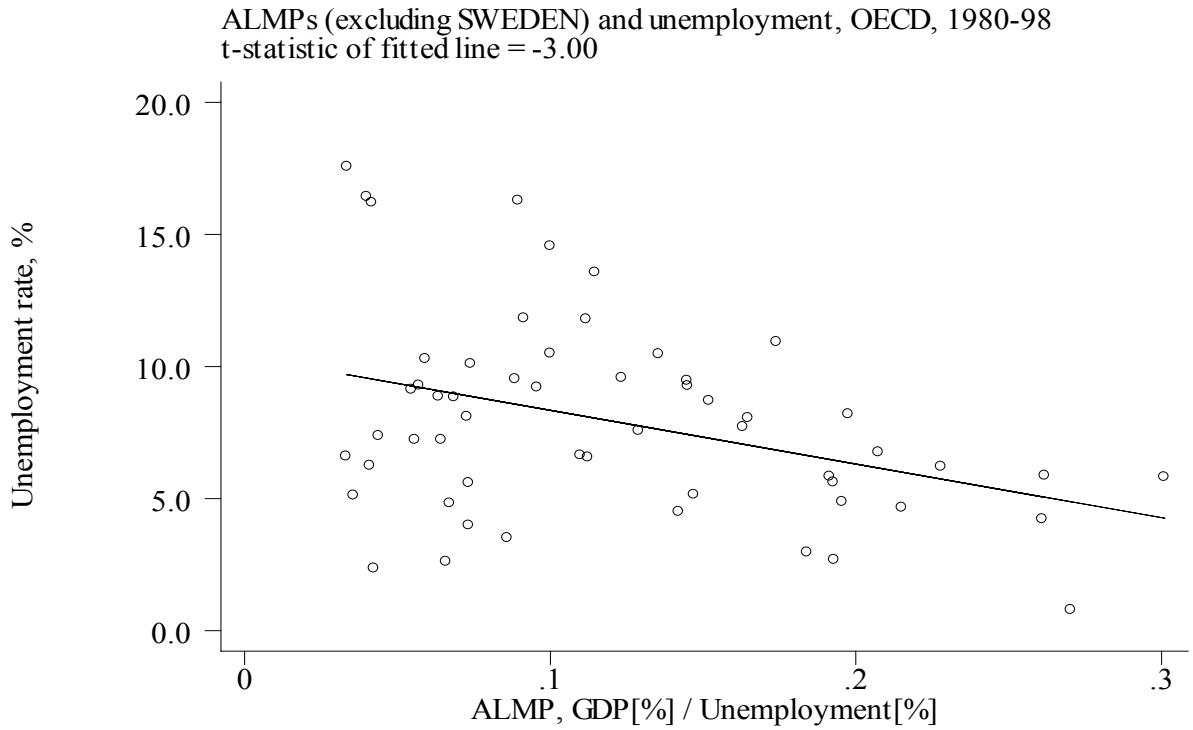


Figure 9


ALMPs (excluding SWEDEN) and unemployment, OECD, 1980-98
t-statistic of fitted line = -3.00
Unemployment rate, %
20.0
15.0
10.0
5.0
0.0
0
.1
.2
.3
ALMP, GDP[%] / Unemployment[%]

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