

The Determination of Unemployment Benefits

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While much empirical research exists on labor market consequences of unemployment benefits, there is remarkably little evidence on the forces determining benefits. We present a simple model where workers desire insurance against unemployment risk and benefits increase the unemployment rate. We then conduct one of the first empirical analyses of the determinants of the parameters of the benefit system. Using data for developed countries for 1971–89, controlling for year and country fixed effects and the government’s political color, we find evidence that the level of benefits falls when the unemployment rate is high. This is consistent with Wright’s tax effect.

I. Introduction

Countries differ in the generosity of their unemployment benefit programs. Within each country, unemployment benefit programs change over time. Why? What are the causes of these differences? This article provides an attempt at evaluating how much of these variations can be explained by economic and political factors. In other words, we attempt to study the determinants of unemployment benefits.

Although considerable attention has been paid to the growth of the

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welfare state as measured by total welfare spending (e.g., Ram 1987), there appears to be no previous published empirical work on the determinants of an unemployed worker's benefit allowance. Most of the existing empirical research related to unemployment benefits concentrates on the effects of benefits in unemployment regressions (e.g., Ehrenberg and Oaxaca 1976; Feldstein 1978; Layard, Nickell, and Jackman 1991) without analyzing the possibility that benefits may be endogenously determined. This, and related work, has been interpreted by some economists as indicating that an overgenerous welfare state is behind the poor economic performance of certain European countries. They favor benefit cuts as a cure for the unemployment problem. Yet a policy of cutting unemployment benefits to help the unemployed sounds paradoxical.¹ It seems that before taking any macroeconomic policy actions we should conduct a more careful inquiry into the determinants of unemployment benefits.

This article presents a simple model in which workers desire insurance against unemployment but higher benefits require higher taxes (budget constraint) and bring about higher unemployment (incentive constraint). Using Organization for Economic Cooperation and Development (OECD) data for 1971–89 (OECD 1994), we show how economic and political variables affect the parameters of the unemployment benefit system.

To our knowledge, only two theory articles have looked at the positive aspects of the determination of unemployment benefits.² In Wright (1986), the level of unemployment insurance is set by the employed majority. A prediction of his model is that a higher discount rate lowers the optimal level of benefits for the employed median voter. He also shows that the response of the employed majority to a higher unemployment rate may be to make the system less generous, a result also emphasized in Atkinson (1990). Neither article, however, takes into account the incentive effects of benefits (i.e., neither allows for a positive impact of unemployment benefits on the unemployment rate), an important feature of our model. A relevant article presenting a normative analysis is Boadway and Oswald (1982). They show how a government that has redistributive objectives may optimally intervene in the economy by providing unemployment benefits. Thus, the empirical prediction is that left-wing preferences of

¹ Layard et al. (1991) dedicate their book to “the millions who suffer through want of work.”

² Following Feldstein's criticism of the incentive effects of benefits (Feldstein 1978), there have been considerable efforts on the normative side (see, *inter alia*, Baily 1978; Flemming 1978; Shavell and Weiss 1979). Kiander (1993) derives the optimal unemployment benefit policy for a trade union when search matters, and he shows that it is a decreasing function of the trade union's share of the costs of the insurance fund.

society, which presumably are correlated with a desire for income redistribution, will have a positive effect on benefits.

Our article is related to the recent work of Rodrik (1998; see also Cameron 1978). He finds a positive correlation between a country's level of openness and the amount of government consumption and argues that more open economies compensate their citizens for the higher employment and income risk they have to face. The evidence, however, comes in the form of regressions of social security and welfare expenditures (as a percentage of gross domestic product [GDP]) on openness and terms of trade instability. Three aspects of the link between risk and insurance remain to be established, however. First, from a theory point of view, it would be important to have more evidence on the channel through which the link operates. In other words, we would like to be sure that the measure of external risk of the country affects variables that capture the type of personal risks that people care about (e.g., falling unemployed) and also that the government's reaction involves a program that is related to that risk (e.g., unemployment benefits). Second, and perhaps more important, the measure of social insurance used by Rodrik (social security and welfare spending over GDP) depends directly on the number of claimants. This, in turn, may be affected by risk. That is, for a number of categories of social spending, the left-hand variable may not be defined independently from the right-hand variable.³ This means that he is unable to distinguish insurance effects from tax considerations. Indeed, when risk increases and there is an increase in the number of unemployed claimants, there will be a corresponding pressure for higher tax contributions to fund the system. This will produce both a tendency for lower unemployment benefit allowances and, if the increase in unemployment is high enough, the positive correlation observed by Rodrik (1998). Our article comes closer to avoiding these problems by looking directly at the link between unemployment and the parameters of the unemployment insurance programs.

A potentially important application of the present article has been pointed out by Blanchard and Katz (1997). They suggest that the evidence presented here could be used to evaluate the relative importance of the channels through which hysteresis operates. If countries that experience shocks to the unemployment rate increase their level of unemployment benefits (depending on the political party that is in power), and if this

³ An example clarifies this. Suppose a country experiences an exogenous shock that increases the unemployment rate. If an unemployment insurance program is in place, that year social security and welfare payments as a percentage of GDP will rise automatically, because there are more claimants to the system. Furthermore, even if total payments have increased, the amount of insurance that people actually get will have fallen. The reason is that the cost of risk (the cost of falling unemployed) goes up with unemployment because expected duration increases.

increases the unemployment rate further, we may then have an explanation for why some countries' unemployment rates remain high for such prolonged periods of time. Di Tella and MacCulloch (2000) show how rationally determined institutions can produce hysteresis. Some of the work of Saint-Paul on labor market flexibility is also relevant to the problems we discuss. A recent review article (Saint-Paul 1996) also looks at the determinants of unemployment benefits using a different specification and compares the author's results with those obtained in an earlier version of this article.⁴ For evidence on welfare preferences, see Luttmer (2001) and Di Tella and MacCulloch (1995*b*).

In Section II, we outline the model, while in Section III, we explain our empirical strategy and describe the data. In Section IV, we present the empirical results. In Section V, we present a discussion of the main implications of our results and avenues for further research. In Section VI, we conclude.

II. A Simple Model

In this section we sketch a simple model to provide a motivation for the empirical section. Unemployment benefits are determined by the government, constrained by its financial possibilities and by labor market conditions, which we assume involve equilibrium unemployment.

The government's problem is to find the level of unemployment benefits, b^s , defined as

$$b^s = \arg \max_b W = \phi[(1 - \psi)V^E + \psi V^U] + (1 - \phi)V^F, \quad (1)$$

such that

$$s = ub \quad \text{Budget constraint} \quad (2)$$

and

$$u = \mu(b, \Omega) \quad \text{Labor market equilibrium,} \quad (3)$$

where V^E and V^U are the lifetime expected utilities of an employed and an unemployed worker, respectively, V^F is the value of firms (if we assume workers and owners of firms are distinct individuals), ψ and ϕ are, respectively, the welfare weights given by the government to the unemployed versus the employed and between workers and firms (where $0 \leq \phi \leq 1$ and $0 \leq \psi \leq 1$), and u is the unemployment rate. The weight ψ will in general be a function of unemployment: $\psi(u)$. For example, if W is a utilitarian social welfare function, then $\psi = u$; however, if the level of benefits is set to maximize the welfare of the employed majority, then $\psi = 0$ and $\phi = 1$.

⁴ For example, he includes a different set of controls and uses a different sample. The working paper version of this article is Di Tella and MacCulloch (1995*a*).

Equation (2) is the budget constraint. It assumes that every employed and unemployed worker pays a tax, s , out of his or her gross income to support the welfare state. Equation (3) is the labor market equilibrium in which firms maximize profits at the point where their labor demand is equated to a “wage curve,” so that the function $\mu(b, \Omega)$ describes how benefits are related to unemployment, and Ω is a vector of parameters (including the price of inputs, inflow rate, etc.). The function $\mu(\cdot)$ could represent a variety of models of wage formation, such as efficiency wages or union bargaining models, where there is involuntary unemployment.

We focus on the Stackelberg equilibrium of the game in which the government is able to commit to a level of benefits (e.g., through legislation) and firms subsequently set wages and employment to maximize profits. The (subgame) perfect Nash equilibrium of the Stackelberg game in which the government moves first is characterized by⁵

$$b = \beta(u, \Sigma), \quad (4)$$

where Σ is a vector of parameters including the welfare weights, the rate of time preference, and labor market conditions, including the inflow rate into unemployment and the expected duration of unemployment and other factors that affect the utility of the employed and the unemployed, such as their social status.⁶ In general (provided that firms’ profits are a negative function of benefits), we find that as the welfare weighting of firms versus workers rises the government’s choice of benefits will be lower. Comparative static results for other variables depend on the unemployment/benefit trade-off (these are shown in app. A).

To see the intuition behind those results, first assume that benefits do not affect unemployment. As long as the weight $\psi < u$, we do not have full insurance. The effect of a higher level of unemployment (due to an exogenous shock) on the level of benefits is ambiguous. On the one hand, higher unemployment means a higher tax burden for the employed (so benefits would fall, as in Wright [1986] and Atkinson [1990]), but it also means that they should expect spells of longer duration if they were to fall unemployed (so they would like to see higher benefits). Appendix A shows conditions under which the first effect dominates. A higher dis-

⁵ Note the element of dynamic inconsistency: the government must be able to commit to the Stackelberg benefit level, since, given the unemployment rate, it has a profitable deviation. Such extensions are important when dealing with practical issues on policy reforms, although they are outside the scope of this article. Results for the Nash equilibrium are available in our working paper (Di Tella and MacCulloch 1995a).

⁶ An interesting feature of the model is that we can define political ideology using economics: a left-wing political party is one that values more an extra util (in the social welfare function) achieved through extra insurance than an extra util achieved through lower taxes. The opposite is true for a right-wing party.

count rate leads to lower benefits, because the employed do not want to pay taxes now for benefits they will receive in the future, an effect already present in Wright (1986). To the extent that a higher discount rate would increase the level of unemployment (as in some efficiency wage models), we would expect to find a negative tax effect that would reinforce the Wright effect and a positive effect through longer expected duration (as the employed want better insurance).⁷ Higher inflows, on the other hand, lead to higher benefits as the employed want more insurance. To the extent that inflows increase the unemployment rate, we would again expect to find a negative effect on benefits (because of the higher tax burden) and a positive effect because of the longer expected duration when the unemployment rate is higher.

The case when benefits increase unemployment is more complicated. A general point is that the unemployment costs of benefits mean there is not full insurance, even if $\psi = u$. Thus, now falling unemployed is more costly, and any factor that increases the duration of unemployment has a more positive effect on benefits. Furthermore, reducing benefits has the advantage that, *ceteris paribus*, it reduces unemployment (hence taxes) and the expected duration of unemployment spells (for details, see app. A).

III. Empirical Strategy and Data

The following linear form of equation (4) in Section II is estimated:

$$\begin{aligned} \text{Benefits}_{iT} = & \alpha \text{Unemployment}_{iT} + \beta \text{Inflows}_{iT} + \gamma \text{Right wing}_{iT} \\ & + \delta \text{Time preference}_{iT} + \eta_i + \omega_T + \epsilon_{iT}. \end{aligned} \quad (5)$$

We control for both country (η_i) and time (ω_T) fixed effects so the basic estimator is least-squares dummy variables (LSDV). Our dependent variable (*Benefits*) is calculated as the pretax average of the unemployment benefit replacement ratios for two earnings levels, three family situations, and three durations of unemployment (see app. B for the exact variable definitions). As an index, this summary measure is not necessarily close to the initial replacement ratio people are entitled to after losing a job or to the average level of benefit currently received by unemployed people. It is not weighted, for example, by the composition of unemployment in each country and year. Importantly, since it covers a variety of typical cases (e.g., single, married with or without a dependent spouse), it is not prone to the weakness of other benefit data that do not reflect a common practice whereby cuts in one type of benefit are simply offset by a cor-

⁷ In a model in which saving is allowed, a higher rate of interest (maybe because monetary policy is tight) may make individuals less willing to vote for a generous welfare state. This would happen if the return from investing the tax contributions becomes larger than the expected benefit from having benefits if one falls unemployed.

responding increase in another type.⁸ Although our data still have a number of weaknesses (e.g., there is no allowance for the fact that, in some countries, governments support the unemployed through subsidies linked to their previous employers rather than through benefits), we believe it represents a significant improvement over previously available benefit data. Furthermore, many of the other differences in labor market institutions between countries can be controlled for by the use of the country dummies, η_i , in our regression equations.

One potential problem with the data is that they mix insurance payments with social assistance. The latter is typically not linked to previous employment and contributions to an insurance fund. In other words, the logic of such payments may have more to do with reducing inequality than with providing insurance. We obtained the raw OECD data and constructed the average benefits corresponding to the first year in unemployment and called it *Benefits short*. We also calculated the average level of benefits for people who have been unemployed for more than 3 years. This variable is called *Benefits long* and is presumably driven by a different economic logic than first-year unemployment insurance. In fact, the raw correlation coefficient between the two measures of benefit generosity is 14%. In figures A1–A5 in appendix B we graph these three measures for five selected countries (United States, Canada, France, United Kingdom, and Ireland). *Benefits short* and *Benefits long* appear to behave differently. Appendix B also provides a brief description of the unemployment benefit programs in place in each country in a typical year. It shows that the primary component during most of the first year is an unemployment insurance system (the exceptions are Australia and New Zealand). The duration of this program varies across countries. It also shows that when one gets past the third year, the main component of unemployment compensation is unemployment and social assistance (notable exceptions are Belgium and France). Assistance refers to means-tested income support whereby the government acts to secure a minimum standard of living. See appendix B.

The variable *Right wing*, a measure of how far the political preferences of the government lean toward the right, proxies for both the relative power of firms over workers $1 - \phi$ and that of employed workers over the unemployed, $1 - \psi$. This variable is similar to those employed by political scientists to indicate the left/right position of a government and is constructed in two steps. In the first step, we collect the number of

⁸ The OECD produced the data in 1994. They are available every 2 years, so we use 2-year averages for all the other variables used, and a period in eq. (5) equals 2 years. Interpolating the benefit data would allow us to run regressions with 320 observations, although it may give the impression that we have more information than we actually do.

Table 1
The Determinants of Unemployment Benefits in 16 OECD Countries,
1971–89

	Regression					
	(1) LSDV	(2) LSDV	(3) LSDV	(4) IV	(5) IV	(6) IV
<i>Unemployment</i>	-.547** (.269)		.104 (.397)	-1.574** (.600)		2.102 (1.610)
<i>Unemployment</i> (-1)		-.832** (.258)	-.920** (.404)		-1.547** (.570)	-3.647** (1.609)
<i>Interest rate</i>	.352* (.213)		.236 (.204)	.449** (.230)		-.052 (.276)
<i>Interest rate</i> (-1)		.452** (.197)	.447** (.205)		.530** (.210)	.644** (.257)
<i>Right wing</i>	-1.181 (2.380)		2.519 (3.115)	-.879 (3.048)		2.781 (3.655)
<i>Right wing</i> (-1)		-4.611* (2.725)	-5.549* (3.102)		-3.934 (2.845)	-2.714 (4.043)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	160	158	158	160	158	158
R^2 (adjusted)	.87	.89	.88	.86	.88	.84

NOTE.—*Benefits* is the dependent variable for this table. Standard errors appear in parentheses. LSDV denotes least-squares dummy variables; IV denotes instrumental variables. Openness and its lag are used as instruments in regression (4). Lagged openness is used as an instrument in regression (5). Regression (6) uses the level of home ownership, the lag of openness, and the level and lag of oil and military spending as instruments. *Right wing* has been scaled down by a factor of 1,000.

* Significant at the 10% level.

** Significant at the 5% level.

votes received by each party participating in the cabinet and express them as a percentage of the total votes received by all parties with cabinet representation. This percentage of support is then multiplied in the second step by a left/right political scale (from Castles and Mair 1984) and summed across all the cabinet parties to give a continuous variable. Workers' discount rate is proxied by the long-run real interest rate paid by the government on long-term bonds (*Interest rate*), which we obtained from the *OECD Historical Statistics* (OECD, various issues). Budget constraint effects are captured by including the unemployment rate (*Unemployment*). An important limitation for our empirical efforts is the lack of suitable inflow data. Some regression specifications we will use can be reinterpreted so that the change in the unemployment rate ($\Delta Unemployment$) acts as a proxy for the inflow rate. Appendix B (tables A1 and A2) presents the raw data and all data definitions.

IV. The Empirical Evidence

Regression (1) in table 1 estimates a basic version of equation (5). It reveals a significant negative coefficient on the unemployment rate, consistent with budget constraint effects as described in the model in Section II and earlier in Wright (1986) and Atkinson (1990). The size of the

coefficient predicts that an increase of 3.4 percentage points (one standard deviation) in the level of unemployment, *ceteris paribus*, reduces benefits by 1.9 percentage points or 14% of a standard deviation in the benefits variable ($-0.547 \times 0.034/0.129$). The coefficient on the real interest rate is positive, though the effect is significant only at the 10% level. Although multicollinearity is a potential source of concern, we note that this result stands in contrast to the predictions of models with no incentive effects of benefits, such as Wright (1986). Regression (1) reveals no significant effects of the political inclination of the government (*Right wing*) on unemployment benefits (although the coefficient is negative, consistent with Boadway and Oswald [1982]).⁹ Thus, controlling for economics, the basic evidence shows no effects of politics on benefit determination, which is perhaps surprising.

Regression (2) allows for a lag in the determination of unemployment benefits. Although our model does not consider such dynamics explicitly, it may be reasonable to expect some delay until political and economic changes affect unemployment benefits. A possible motivation is that legislators need to take notice of such changes or, in extreme cases, need to be replaced by individuals more sensitive to the new demands.¹⁰ The results suggest this is largely the case. The coefficient on the unemployment rate is 52% larger in absolute value (i.e., more negative) than that in regression (1), while the standard error is of similar size. It is also economically significant. A one standard deviation increase in the unemployment rate is associated with a decrease in benefits of 2.8 percentage points 1 period later. This equals 22% of a standard deviation in benefits. There is still evidence of a positive effect of the interest rate, this time significant at the 5% level. The political inclination of the government is significant at the 10% level. A change in government equivalent to replacing François Mitterrand with Margaret Thatcher (equal to 3.5 standard deviations in the variable *Right wing*) is expected to bring about a reduction in unemployment benefits of 2.5 percentage points (or 20% of a standard deviation in the benefits variable). Using these estimates, it seems that substituting Thatcher for Mitterrand is equivalent (in terms of benefits and other things equal) to increasing the unemployment rate by

⁹ The regression results look almost identical if *Right wing* is excluded and if estimation is by generalized least squares (GLS) random effects (Balestra-Nerlove) instead of LSDV. This section reports a number of results that are not included in the tables but are available upon request.

¹⁰ In other words, we assume there is indirect democracy. Note that, because the data are available only for every 2 years and a lag in these variables involve data from previous periods, we estimate effects of up to 4 years (i.e., within one legislative period). The average election in our sample occurs every 4 years.

2.9 percentage points.¹¹ To get a better feel for the relative size of these effects, note that in terms of a one standard deviation increase in each variable, the politics effect is equal to 26% of the unemployment effect. Regression (3) presents a more general specification using current and lagged values with largely similar results.

Although our model does not lead us to believe that fiscal or income variables would have an independent impact on benefits, we check if our results are robust to the inclusion of such control variables. We include government debt over GDP and government deficit over GDP (from the International Monetary Fund's International Financial Statistics) to control for the government's fiscal position. The main results are unchanged. For example, in a specification similar to regression (2), which also includes the debt and deficit variables, we find very similar results in terms of size, sign, and significance. If we include the debt and deficit variables, as well as a country's GDP per capita (to see whether there are "wealth" effects), the coefficient on *Unemployment* (-1) keeps its sign but falls (in absolute value) by almost 24% and is significant at the 6% level.

Another potential objection to regressions (1)–(3) is that the unemployment effects may simply be capturing reverse causality. A large literature in economics has found positive effects of benefits in unemployment regressions, so a simultaneity bias may be present in the unemployment coefficient. The first thing to note is that the coefficient on *Unemployment* in regressions (1)–(3) is actually negative, and the presumed simultaneity bias is positive. Hence, if there were a bias at all, it would only mean that the true coefficient on *Unemployment* is larger in absolute value (i.e., more negative). Second, we run regressions of the form $Y = f[Unemployment(-1), Unemployment(-2), Benefits(-1), Benefits(-2)]$, for both $Y = Unemployment$ and $Y = Benefits$ for 19 OECD countries during 1971–89. When $Y = Unemployment$, at least one coefficient on lagged benefits was significant in 12 of the 19 cases, although in three of them the coefficient was negative. When $Y = Benefits$, at least one of the coefficients on *Unemployment* was significant in 10 of the 19 cases, of which four indicated that positive changes in unemployment increased the level of *Benefits*, four suggested that higher levels of *Unemployment* reduced *Benefits*, and one had a positive coefficient. These results suggest that, in terms of Granger causality, it is just as likely that causality runs from unemployment to benefits as it is that causality runs the opposite way. Third, we look at the effect of the oil crisis by comparing the change in benefits during the 4-year periods 1971–75 and 1977–81. In both cases, the increase in unemployment ben-

¹¹ The election of Mitterrand may itself have been the endogenous response of voters for the party with more generous welfare policy in bad times. Such dynamics are beyond the scope of this article.

efits was larger in the countries that were more dependent on oil, measured by the price of oil (adjusted by exchange rates and weighted by the country's net oil imports divided by GDP).

Another approach is to instrument the unemployment rate. The instrument used in regression (4) in table 1 is the level of openness in the economy (defined as exports plus imports over GDP) and its lag. The coefficient on *Unemployment* is negative, significant, and larger in absolute value than the ordinary least squares (OLS) estimate. This is to be expected, as the presumed simultaneity bias is positive. The coefficients on *Interest rate* and *Right wing* are similar to the OLS estimates. We experimented with other variables as instruments, such as the import-weighted, country-specific price of oil, an index of military expenditures (suggested by Phelps 1994), and the proportion of home ownership (as in Oswald 1997), with very similar results.¹² The instruments pass standard tests for instrument validity, although the low power of such tests is a source of concern. A similar picture emerges from focusing on the lagged values in regression (5). This specification uses the lag of openness as an instrument for *Unemployment* (−1). The instruments used in regression (6) are the level of home ownership, the lag of openness, and the level and lag of the import-weighted price of oil and the index of military spending.

A third potential objection to regressions (1)–(3) is that the benefit data mix up data on unemployment insurance programs with traditional income support programs (welfare). In some countries—the United States and Canada are two examples—people using unemployment insurance programs are a very different group of individuals than people on welfare, so that very different political and economic dynamics may drive movements in these components of the benefit measure. In order to investigate this issue, we obtained the raw data used to construct the benefit index from the OECD and calculated two different measures of benefits.¹³ The first one, called *Benefits short*, is a summary measure of the benefits received by a typical person during his or her first year unemployed. The second one, *Benefits long*, is a summary measure of the benefits received by a typical person after his or her third year unemployed.

¹² The first-stage regressions show that openness is positively related with unemployment. Interestingly, Rodrik (1998) shows that openness increases welfare spending (i.e., benefits times unemployment). He argues that more open economies are more risky, so benefits are higher. However, the alternative hypothesis (that spending increases because there are more claimants at an unchanged level of benefits) should not be discarded, particularly since we show that the parameters of the unemployment benefit system are negatively correlated with the level of unemployment.

¹³ We thank Pascal Marianna and David Grubb at the OECD for providing us with the raw benefit data and generous explanations regarding their construction.

Table 2 repeats some of the basic specifications in table 1 but using *Benefits short* as the dependent variable (in regressions [7]–[9]) and *Benefits long* as the dependent variable (in regressions [10]–[12]). The estimated effects using *Benefits short* are larger than those presented in table 1. Regression (7), for example, estimates that a one standard deviation increase in the unemployment rate leads to a cut of 8.5 percentage points in the *Benefits short* variable, or 40% of a standard deviation in this variable. Regression (8) presents the general specification with similar results. Regression (9) uses the same instrument as is used in table 1 for this specification, lagged openness. It shows that the instrumental variables (IV) estimate is much closer to the OLS estimate when the dependent variable is *Benefits short* than when it is *Benefits*. In regressions (10)–(12), which examine the determinants of long-term benefits, *Benefits long*, the results are much weaker. Most of the economic dynamics that appear to be driving short-term benefits are absent here. There is some evidence that political pressures affect *Benefits long*. Regression (10) shows that a change in government equivalent to replacing François Mitterrand with Margaret Thatcher is expected to bring about a reduction in unemployment benefits of 3.1 percentage points, or 26% of a standard deviation in the *Benefits long* variable. Regression (12) shows that the same variable, lagged openness, now performs badly as an instrument for lagged unemployment.

Movements in interest rates (even at 2-year frequencies) could be influenced by transitory movements in monetary and fiscal policy, and such changes may not influence people's decision to fund the welfare state. We repeated all the regressions presented excluding the interest rate. All the main results continue to hold. The main exception is regression (1) in table 1, where the coefficient on *Unemployment* is significant only at the 7% level. Regression (13) in table 3 illustrates with the simple lagged specification.

A related question deals with the nature of unemployment. Economists have observed that an unemployment rate driven by a large number of people who spend little time unemployed could involve lower social costs than a similar rate of unemployment made up by few people who spend a long time unemployed. Accordingly, it may be argued that long-run unemployment may bolster political demands for unemployment benefits more than short-run unemployment. Data of this kind are available for only some of the countries in our sample, and often for a limited number of years. Thus, the evidence we provide is only suggestive, and a proper test of how robust our main findings are to these considerations must be left to future research. Table 3 shows how benefits are related to the two measures of unemployment. It is suggestive that higher rates of long-run unemployment (the number of individuals who have been unemployed longer than 6 months divided by the labor force) tend to be associated

Table 2
The Determinants of Short-Term and Long-Term Unemployment Benefits, 1971–89

	Dependent Variable: <i>Benefits short</i>			Dependent Variable: <i>Benefits long</i>		
	Regression (7) LSDV	Regression (8) LSDV	Regression (9) IV	Regression (10) LSDV	Regression (11) LSDV	Regression (12) IV
<i>Unemployment</i>		-.579 (.706)			.641 (.466)	
<i>Unemployment</i> (-1)	-2.507** (.459)	-2.056** (.718)	-2.121** (.986)	-.001 (.308)	-.518 (.474)	.994 (.686)
<i>Interest rate</i>		.420 (.362)			.274 (.239)	
<i>Interest rate</i> (-1)	.688** (.350)	.630* (.364)	.646* (.364)	.278 (.235)	.314 (.240)	.170 (.253)
<i>Right wing</i>		1.778 (5.537)			5.433 (3.657)	
<i>Right wing</i> (-1)	-4.008 (4.839)	-5.189 (5.516)	-4.373 (4.923)	-5.584* (3.246)	-7.308** (3.642)	-6.526* (3.422)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	158	158	158	158	158	158
R ² (adjusted)	.87	.87	.87	.82	.82	.80

NOTE.—Standard errors appear in parentheses. Short-term unemployment benefits are defined as having duration of less than 1 year. LSDV denotes least-squares dummy variables; IV denotes instrumental variables. Regressions (9) and (12) use lagged openness as an instrument. *Right wing* has been scaled down by a factor of 1,000.

* Significant at the 10% level.

** Significant at the 5% level.

Table 3
The Determinants of Unemployment Benefits, Further Specifications

	Regression (13) LSDV <i>Benefits</i>	Regression (14) LSDV <i>Benefits</i>	Regression (15) LSDV <i>Benefits short</i>	Regression (16) LSDV <i>Benefits long</i>	Regression (17) SGMM <i>Benefits</i>	Regression (18) SGMM <i>Benefits</i>
<i>Benefits</i> (−1)					.928** (.053)	.944** (.051)
<i>Unemployment</i> (−1) < 6 months		−.998 (.892)	−2.450 (2.223)	−.262 (.923)		
<i>Unemployment</i> (−1) > 6 months		.743* (.430)	−.236 (1.072)	1.156** (.445)		
<i>Unemployment</i>						.871 (.545)
<i>Unemployment</i> (−1)	−.748** (.260)				−.418* (.237)	−1.255* (.662)
<i>Interest rate</i>						−.049 (.215)
<i>Interest rate</i> (−1)		−.016 (.317)	.375 (.789)	.051 (.328)	.058 (.143)	.033 (.130)
<i>Right wing</i>						−.792 (1.031)
<i>Right wing</i> (−1)	−5.176* (2.758)	3.418 (3.066)	4.855 (7.348)	4.392 (3.173)	−2.829** (1.011)	−2.866** (1.026)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	158	71	71	71	158	158
R ² (adjusted)	.88	.94	.89	.93	.94	.94

NOTE.—*Benefits*, *Benefits short*, and *Benefits long* in column headings are the dependent variables for the regressions. Standard errors are in parentheses. LSDV denotes least-squares dummy variables. Regression (17) uses the lags of openness, home ownership, and military spending as instruments, while regression (18) uses the lags and levels of the price of oil, military spending, and the lags of openness and home ownership. *Right wing* has been scaled down by a factor of 1,000.

* Significant at the 10% level.

** Significant at the 5% level.

with higher benefits, while the opposite is true for the short-run unemployment rate. For example, we can reject the hypothesis that the coefficient on long-run unemployment is equal to that on the short-run unemployment rate in regression (14) at the 8% level. Regressions (15)–(16) in table 3 look for differential effects of short- and long-run unemployment on *Benefits short* and *Benefits long* using the lagged specification (which is the one yielding more precise estimates). The evidence tends to favor the hypothesis that long-run unemployment bolsters demands for more generous long-duration benefits.

Last, it could also be argued that we should include a lagged dependent variable. Although our theory does not lead us to expect that the long-run response of benefits to exogenous variables differs in the short run and the long run, it is important at this stage of our theoretical knowledge to keep our empirical strategy open. We repeat regressions (2) and (3) but include a lagged dependent variable. The maximum number of periods available equals 10, so a bias on the lagged dependent variable may be present. To correct for this, the System Generalised Method of Moments (SGMM) technique developed by Arellano and Bond (1991) for dynamic panel data is used to estimate regressions (17)–(18).¹⁴ Although this estimator controls for the bias in the lagged dependent variable and for the omitted-variable bias that occurs in OLS estimation, we still have to deal with the potential endogeneity of *Unemployment* and *Unemployment* (–1). Hence, we use openness, military spending, and home ownership as instruments. In regression (17), the coefficient on the lagged dependent variable is large and significant, while that on *Unemployment* (–1) is negative and significant at the 10% level. *Right wing* (–1) also has a negative coefficient that is now significant at conventional levels. Its size implies that an increase in the right-wing inclinations of the government equal to 3.5 standard deviations (equivalent to replacing Mitterrand with Thatcher) reduces the benefit replacement rate by 1.6 percentage points in the short run. The long-run effect is to cut benefits by 22 percentage points. The coefficient on the rate of interest is insignificant. Regression (18) repeats the exercise including current values.

V. Discussion and a Puzzle for Future Research

An important implication of the evidence gathered here concerns models of hysteresis. Blanchard and Katz (1997) have remarked that if insti-

¹⁴ The estimator works by combining moment conditions for equations in first differences with moment conditions for equations in levels. By exploiting the information contained in the levels and the first-differenced equations at each point in time, the estimator is the most efficient available to correct for the bias arising in panels with lagged dependent variables that control for fixed effects (for more details, see Arellano and Bond [1991]).

tutions are affected by economic conditions (apart from political forces), then a channel for unemployment persistence is opened. The empirical message of our article is simple. On the one hand, economics matters much in the determination of unemployment benefits, even more than politics. On the other hand, the regression evidence we present shows that higher unemployment reduces the level of benefits with a lag. This is consistent with the models of Wright (1986) and Atkinson (1990) but casts doubt on the possibility of hysteresis through endogenous unemployment benefits.

A puzzle remains, however. There are a number of instances where increases in unemployment (albeit during very turbulent times) seem to be associated with increases in the generosity of unemployment benefits. One example concerns the birth of the American welfare state, which took place during the Great Depression. Another example is the increases in unemployment benefits that took place in a number of OECD countries following the first oil shock. Our conjecture is that higher risk is an omitted variable. Our regressions do not properly control for the level of risk in the economy, a variable that our model suggests may have an important role in the determination of unemployment benefits. Individuals, even if currently employed, may vote to have higher unemployment benefits when the environment becomes more risky or if falling unemployed becomes more costly. Lack of adequate data (e.g., on inflows) means that a proper test of this hypothesis must be left for future research. Separating cyclical from structural unemployment may also help resolve this puzzle. The following two small pieces of evidence suggest that it is important to explore the existence of such “insurance effects” in benefit determination.

A. Regression Evidence

The first involves a simple reinterpretation of the regressions where both levels and lags of the unemployment rate are included. Such regressions, for example, regression (3) in table 1, could be interpreted as including a contemporaneous term and a term denoting the change in the unemployment rate (because $AUnemployment_t + BUnemployment_{t-1} = (A + B)Unemployment_t - B\Delta Unemployment_t$). This is important because the change in the unemployment rate could be interpreted as a very crude measure of the inflow rate from employment into the unemployment pool. For the limited sample where we also have data on short-run unemployment (which is closer to inflow data than the aggregate unemployment rate), we observe that the correlation coefficient of the change in this variable with $\Delta Unemployment$ is 0.66. But the available evidence does not suggest that all changes in unemployment are driven by changes in short-run unemployment. It should be noted that $\Delta Unemployment$ is

also highly correlated with changes in long-run unemployment (correlation coefficient equal to 0.88) and that changes in short- and long-run unemployment are correlated (0.28). Consequently, the use of $\Delta Unemployment$ also captures changes in unemployment duration.¹⁵

When we reinterpret the results in regression (3), the coefficient on the current unemployment rate is -0.8 (significant at the 1% level), while the coefficient on the change in the unemployment rate is 0.9 (significant at the 2% level). The effects are economically significant. A one standard deviation increase in $\Delta Unemployment$ increases the level of benefits by 1.2 percentage points, or 9% of a standard deviation in the benefits variable. From a policy perspective, these results suggest that governments may not want to reduce unemployment benefits (and taxes) when unemployment is rising, even when the unemployment rate is high.

B. Direct Evidence

This section provides direct evidence on the effect of the economic environment on benefit generosity (mainly concerning duration), as stated in the laws defining benefit provision in several countries. Its main interest lies in the fact that these laws seem to specify a channel whereby increases in unemployment can be traced to higher unemployment benefits.

In the United States, the Federal/State Extended Compensation Act of 1970 established a second layer of benefits for claimants who exhaust their regular entitlement during periods of relatively high unemployment in a state. This program provided for up to 13 extra weeks of benefits at the claimant's usual weekly benefit amount. The benefits are triggered on if the state's insured unemployment rate for the past 13-week period is at least 5% and is 20% higher than the average rate (for the corresponding period) in the past 2 years. Extended benefits cease to become available when the insured unemployment rate does not meet either the 20% requirement or the 5% requirement.

Over the years there were some changes to this law. The 1975 change could also be traced back to an "insurance effect." In that year, as labor market conditions worsened after the first oil shock from the relatively stable period in the early 1970s, federal law made unemployment insurance payable "for additional 26 weeks in cases of high unemployment." This ruled until 1983, when federal law reduced the extension back to 13 weeks

¹⁵ Note, however, that if average duration increases, our model suggests that workers may demand more insurance because of the higher cost of risk (falling unemployed is more costly) even if the risk is not higher (probability of falling unemployed remains constant). Regression (15) showed some evidence that more long-run unemployment may increase demands for more generous long-duration benefits.

after some years during which unemployment had been high. This change, on the other hand, could be interpreted as a tax effect.

In Canada in 1975, unemployment benefits were “payable after a 2-week waiting period for 18 weeks extended up to 51 weeks, depending on [national and regional unemployment rates].” Although prior to 1977 benefits depended on both the national and the regional unemployment rates, after 1977 new legislation made extensions to benefit duration dependent solely on regional unemployment rates. In 1979 unemployment benefits were payable for “up to 25 weeks, extended up to 50 weeks, depending on regional unemployment rates.” There have been a number of subsequent changes to the Canadian unemployment insurance system, three of which have involved changing the relationship between benefits and regional unemployment rates. In 1990 benefit durations varied between 17 and 50 weeks, in 1994 this was changed to between 14 and 50 weeks, and in 1996 it was changed again to vary between 14 and 45 weeks (all depending on the number of weeks the claimant has worked and the unemployment rate in the region).¹⁶

Other countries have also produced similar legislation. In South Africa, for example, there exists administrative discretion to increase the generosity of benefits (in terms of both duration and amount) in cases of prolonged unemployment. In Japan there are additional allowances for workers in depressed industries. Another example where a related process is visible includes countries that have recently made promarket reforms and have seen benefit demands vary with the consequent rise in unemployment. In Argentina, for example, the increase in unemployment following the free market reforms in the early 1990s has “provoked calls from the unions and the church to direct more spending towards public works and increase the coverage and duration of unemployment benefits” (Warn 1995).

VI. Conclusion

Countries differ in the generosity of their unemployment benefit programs. Within each country, unemployment benefit programs change over time. This article provides a first attempt at evaluating how much of these variations can be explained by economic and political factors. That is, we attempt to study the determinants of unemployment benefits.

To our knowledge, only two theory articles, Wright (1986) and Atkin-

¹⁶The evidence comes from *Social Security Programs throughout the World* (U.S. Department of Health and Human Services, various issues), *Highlights of State Unemployment Compensation Laws*, a U.S. National Foundation for Unemployment Compensation and Workers' Compensation publication (Strategic Services on Unemployment and Workers' Compensation, various issues), and the Department of Human Resources Development of the Canadian government.

son (1990), have looked before at the positive aspects of the determination of unemployment benefits. Neither, however, allows for a positive impact of unemployment benefits on the unemployment rate, an important feature of the model presented here. Benefits are set maximizing the wishes of the employed, the unemployed, and firms subject to budget constraint and a nonnegative trade-off between benefits and unemployment. Comparative static results depend on the size of the “incentive effects.”

Using OECD data for 1971–89 and controlling for both country and time fixed effects, the article finds evidence that benefits fall when the unemployment rate is high. A one standard deviation increase in unemployment (3.4 percentage points) leads to a decrease in benefits equal to 2.8 percentage points (or 22% of a standard deviation) 1 period later. This is consistent with the tax effect identified in Wright’s and Atkinson’s models, as well as the model presented here. There is no evidence, however, of the existence of a negative relationship between the interest rate and benefits (as predicted in Wright [1986]). There is weaker evidence suggesting that benefits decrease with right-wing preferences of the government (consistent with the analysis of Boadway and Oswald [1982]). In fact, the importance of economic variables relative to political variables is, perhaps, one of the more surprising aspects of the analysis we present.

We construct a measure of the parameters of the unemployment benefit system paid out in the first year of unemployment. We then compare this with a measure of long-term benefits. It seems that our results are substantially stronger when the short-term benefits measure is used, suggesting that different political dynamics drive movements in unemployment insurance as compared with welfare payments. We allow for a simultaneity bias on the unemployment coefficient and find some evidence of exogenous effects of unemployment on the parameters of the benefit system. Since the presumed effect of unemployment on benefits has a nonnegative sign, accounting for this bias reinforces the result that a higher level of unemployment leads to a lower level of benefits.

Our key empirical finding is the lagged negative effect of unemployment on benefits. It casts some doubt on the existence of a channel generating hysteresis that operates through rational institutions (Blanchard and Katz 1997). One way to reconcile our findings with unemployment persistence would be to show that there are strong “insurance effects,” that is, that higher risk in the environment leads to more generous benefits. We provide very crude evidence on the impact of risk on benefit determination (based on the analysis of legislative data and using the change in unemployment as a proxy for risk in the environment) that suggests the importance of investigating these matters further. Obtaining better data on inflows and separating the effects of cyclical from structural unemployment are natural next steps for future research.

Appendix A

To put more structure into the problem, assume that there are a fixed number of identical risk-averse workers who derive instantaneous utility $U(\cdot)$. Assume that $U_w > 0$, $U_{ww} < 0$, and $U_e < 0$, where w is the wage and e is effort (subscripts denote partial derivatives). The asset equation for an employed worker is

$$rV^E = U(w - s - e) + t(V^U - V^E). \quad (\text{A1})$$

The asset equation for an unemployed worker is

$$rV^U = U(b - s) + j(V^E - V^U), \quad (\text{A2})$$

where the discount rate is r , the inflow rate of employed workers into unemployment is t , and j is the job acquisition rate. Solving (A1) and (A2) simultaneously yields expressions for V^E and V^U . The first-order condition (FOC) is

$$\phi[(1 - \psi)\frac{\partial V^E}{\partial b} + \psi\frac{\partial V^U}{\partial b} - \psi_u \mu_b(V^E - V^U)] + (1 - \phi)\frac{\partial V^F}{\partial b} = 0. \quad (\text{A3})$$

Case I: No Unemployment/Benefit Trade-off

In order to show the negative discount rate effect of Wright (1986) and the negative unemployment level effect of Wright (1986) and Atkinson (1990) in the simplest possible setting, assume the government is captured by the employed ($\psi = 0$ and $\phi = 1$) so we do not have full insurance.¹⁷ As in these models, assume $\mu_b(b, \Omega) = 0$, so higher benefits do not affect unemployment and worker effort initially plays no role in our model. Assume accessions equal separations. Compute db/du to find that the effect is ambiguous. A higher tax burden for the employed brings about lower benefits, but the higher cost of falling unemployed in the bigger pool of unemployed requires higher benefits (depending on the degree of risk aversion). The first effect dominates when the utility function exhibits constant absolute risk aversion (CARA). To see the effect of the discount rate, use the FOC (A3) to compute $\partial b/\partial r < 0$, and use this to find $db/dr < 0$, assuming CARA. To see that the effect of inflows is ambiguous, compute db/dt . The direct effect of higher inflows is to bring about higher benefits, since the employed want more insurance. The indirect effect of a higher level of inflows (through unemployment) is to decrease the level of benefits with CARA.

Case II: Positive Unemployment/Benefit Trade-off

When $\mu_b(b, \Omega) > 0$, higher benefits induce higher unemployment. Assume the trade-off is derived from the Shapiro and Stiglitz (1984) model

¹⁷ We concentrate on the case in which the government is the sole provider of benefits. Explaining why private firms do not provide unemployment insurance is beyond the scope of this article.

in which firms are able to imperfectly monitor a worker's effort so that workers must choose between supplying the required level of effort and shirking, in which case there is a probability, q , that the worker will be caught and fired. Because of the monitoring problem, worker effort, e , will be a function of the excess of wages over the opportunity cost of work, which depends on unemployment benefits and the unemployment rate. Consequently, firms find it individually profitable to pay higher than market clearing wages to deter shirking. Under these assumptions a "no-shirking condition" can be derived that describes an inverse relationship between the unemployment rate and the level of wages. For simplicity, assume $\psi = 0$ and $\phi = 1$.

PROPOSITION 1. If workers have CARA utility,

$$U(y) = -\exp[-\sigma(y - e)]$$

(where y is income and σ is the coefficient of absolute risk aversion), and aggregate labor demand is of the form $w(u) = \alpha + \beta(1 - u)^{-\epsilon}$, where $\epsilon > 0$ and $\beta > 0$, then the equilibrium level of benefits is (i) increasing with adverse exogenous shocks that increase the level of unemployment, (ii) decreasing with the inflow rate if $\epsilon < p$ (for p defined below), and (iii) increasing with the discount rate.

Proof. The FOC for problem (1) can be expressed as

$$b^s = \epsilon\beta(1 - u^s)^{-\epsilon} - \left[\sigma \left(1 + \frac{q + Ar}{At} u^s \right) \right]^{-1}, \quad (\text{A4})$$

where $A = 1 - \exp(-\sigma e)$.¹⁸ The equilibrium unemployment rate, u^s , can be determined as a function of the set of exogenous parameters, Ω , by substituting in (A4) for the labor market equilibrium determined by the intersection of aggregate labor demand with the no-shirking condition: $w(u^s) = b^s + e + (1/\sigma) \ln[1 + A/q(t/u^s + r)]$.

i) An exogenous adverse shock that increases the level of unemployment, such as a shock to labor demand arising from a drop in the value of the parameter α , increases both terms on the right-hand side of (A4). The level of benefits is therefore higher.

ii) A higher inflow rate causes the unemployment rate to increase. Use (A4) to define benefits as a function of t . Then the sign of b_t^s equals the sign of $\epsilon - p$, where $p = (1 + rA/q) / \exp\{\sigma[w(u^s) - b^s - e]\} < 1$. This is negative for $\epsilon < p$. Hence the level of benefits is less for a higher level of inflow rate.

iii) A higher discount rate implies a higher level of unemployment. From (A4), the level of benefits will also be higher.

¹⁸ A sufficient condition for the second-order condition to be satisfied is $0 < \epsilon < 1$.

Appendix B

Sample of 16 Countries

Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, New Zealand, Norway, Sweden, United Kingdom, and United States.

Definition of the Variables

Benefits.—The OECD index of (pretax) unemployment insurance benefit entitlements divided by the corresponding wage (calculated for odd-numbered years). This summary measure estimates the situation of a representative individual. It calculates the unweighted mean of 18 numbers based on all combinations of the following scenarios: (i) three unemployment durations (for persons with a long record of previous employment): the first year, the second and third years, and the fourth and fifth years of unemployment; (ii) three family and income situations: a single person, a married person with a dependent spouse, and a married person with a spouse in work; and (iii) two different levels of previous earnings: average earnings and two-thirds of average earnings. See *The OECD Jobs Study* (OECD 1994).

Benefits short.—The OECD index of (pretax) unemployment insurance benefit entitlements divided by the wage, calculated as the unweighted mean of six numbers based on all combinations of the following scenarios: (i) unemployment duration of less than 1 year; (ii) three family and income situations: a single person, a married person with a dependent spouse, and a married person with a spouse in work; and (iii) two different levels of previous earnings: average earnings and two-thirds of average earnings. See *The OECD Jobs Study* (OECD 1994).

Benefits long.—The OECD index of (pretax) unemployment insurance benefit entitlements divided by the wage, calculated as the unweighted mean of six numbers based on all combinations of the following scenarios: (i) unemployment durations of between 3 and 4 years; (ii) three family and income situations: a single person, a married person with a dependent spouse, and a married person with a spouse in work; and (iii) two different levels of previous earnings: average earnings and two-thirds of average earnings. See *The OECD Jobs Study* (OECD 1994).

Right wing.—Index of left/right political party strength, defined as the sum of the number of votes received by each party participating in cabinet expressed as a percentage of total votes received by all parties with cabinet representation multiplied by a left/right political scale constructed by political scientists. Votes are from Mackie and Rose (1982), cabinet composition is from *The Europa Yearbook* (1969–89 editions), and the left/right scale is from Castles and Mair (1984). The scale ranges from 1 to 10.

Interest rate.—The long-run real interest rate, from *OECD Historical Statistics* (OECD, various issues).

Unemployment.—The unemployment rate, from the OECD Center for Economic Performance data set (OECD and CEP 1992).

$\Delta Unemployment$.—The change in unemployment ($= Unemployment_t - Unemployment_{t-1}$).

Unemployment < 6 months.—The proportion of the labor force that has been unemployed for a duration of less than 6 months.

Unemployment > 6 months.—The proportion of the labor force that has been unemployed for durations of more than 6 months.

Principal Features of Nations' Unemployment Benefit Systems¹⁹

1. *Australia*: UA (unlimited duration) and SA.
2. *Austria*: UI (for unemployment durations of up to 1 year), UA (unlimited duration), and SA.
3. *Belgium*: UI (unlimited duration) and SA.
4. *Canada*: UI (for unemployment durations of up to 1 year where benefit durations are extended in regions with high unemployment) and SA.
5. *Denmark*: UI (for unemployment durations of up to 5 years) and SA.
6. *Finland*: UI (for unemployment durations of up to 23 months), UA (unlimited duration), and SA.
7. *France*: UI (for unemployment durations of up to 5 years), UA (unlimited duration), and SA.
8. *Germany*: UI (for unemployment durations of up to 1 year), UA (unlimited duration), and SA.
9. *Ireland*: UI (for unemployment durations of up to 15 months), UA (indefinite duration), and SA.
10. *Italy*: UI (for unemployment durations of up to 6 months).
11. *Netherlands*: UI (for unemployment durations of up to 60 months), UA (limited 12-month duration), and SA.
12. *New Zealand*: UA (unlimited duration) and SA.
13. *Norway*: UI (for unemployment durations of up to 18 months) and SA.
14. *Sweden*: UI (for unemployment durations of up to 10 months),

¹⁹ All information in this list is based on the benefit systems in effect as of July 1, 1995. UI is unemployment insurance. Unemployment Assistance (UA) refers to means-tested benefits that may be conditional on previous employment history. Social Assistance (SA) refers to means-tested income support whereby the government acts to secure a minimum standard of living. SA is included in the OECD Summary Measure of Benefit Entitlements only when it consists of a general income guarantee at the nationally determined level, such as in Belgium, Denmark, France, Germany, the Netherlands, and the United Kingdom. Data sources are *The OECD Jobs Study* (OECD 1994), *OECD Benefit Systems and Work Incentives* (OECD 1998), and *Social Security Programs throughout the World* (U.S. Department of Health and Human Services 1995).

- UA (limited 5-month duration), and SA.
15. *United Kingdom*: UI (for unemployment durations of up to 1 year), UA (unlimited duration), and SA.
 16. *United States*: UI (for unemployment durations of up to 6 months where benefit durations are extended in states with high unemployment) and SA.

Table A1
Description of Data: Most and Least Generous Benefits (1971–89 Averages)

	Netherlands	Denmark	Belgium	Switzerland	Japan	Italy
Benefits	.496	.467	.448	.116	.101	.012

Table A2
Summary Statistics

Variable	Observations	Mean	SD	Minimum	Maximum
<i>Benefits</i>	160	.272	.129	.004	.562
<i>Benefits short</i>	160	.426	.211	.01	.888
<i>Benefits long</i>	160	.167	.120	0	.432
<i>Unemployment</i>	160	.055	.034	-.002	.169
<i>ΔUnemployment</i>	160	.004	.013	-.029	.045
<i>Right wing</i>	160	5.197	1.565	2.275	7.800
<i>Interest rate</i>	160	.022	.035	-.077	.104
<i>Unemployment < 6 months</i>	71	.035	.018	.011	.086
<i>Unemployment > 6 months</i>	71	.034	.033	.001	.137

NOTE.—*Right wing* has been scaled down by a factor of 1,000 in the results reported in tables 1–3.

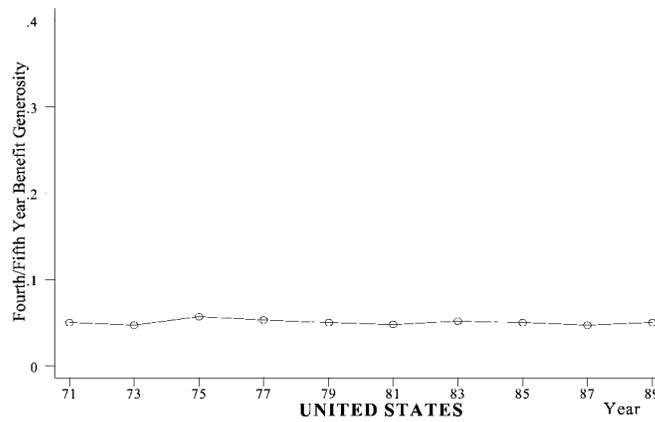
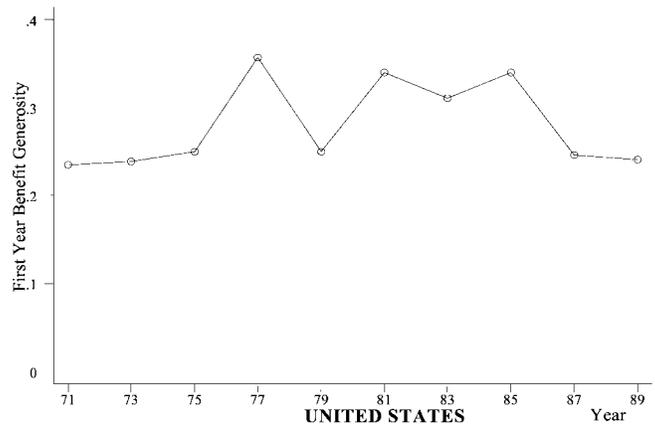
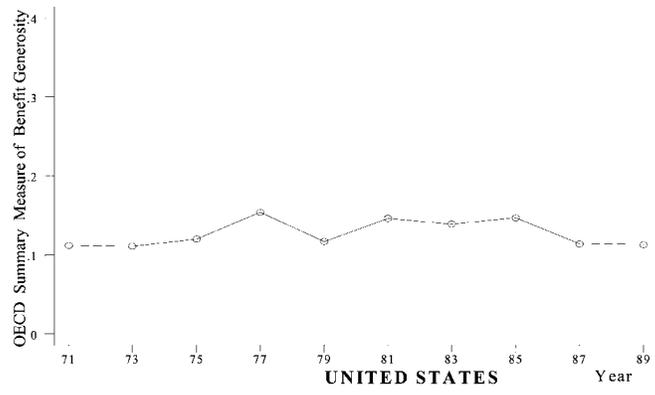


FIG. A1.—The OECD summary measure of unemployment benefits, first-year benefits, and fourth/fifth-year benefits for the United States.

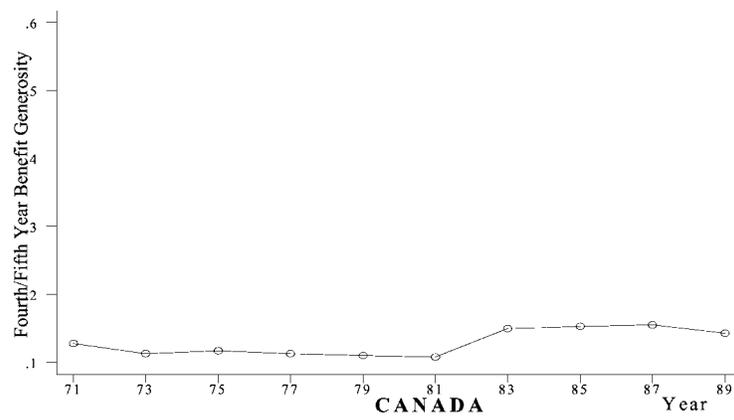
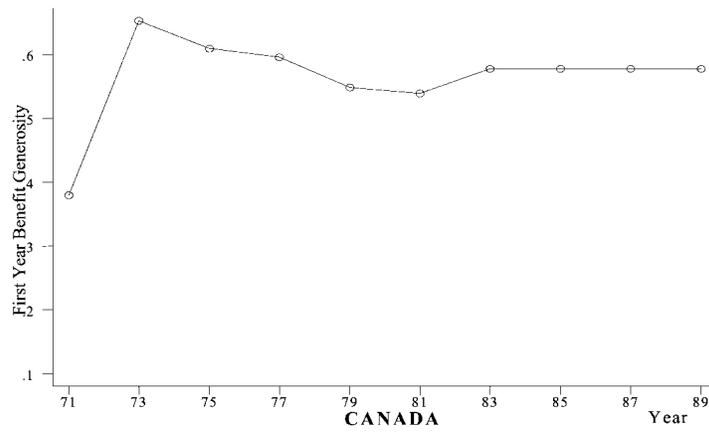
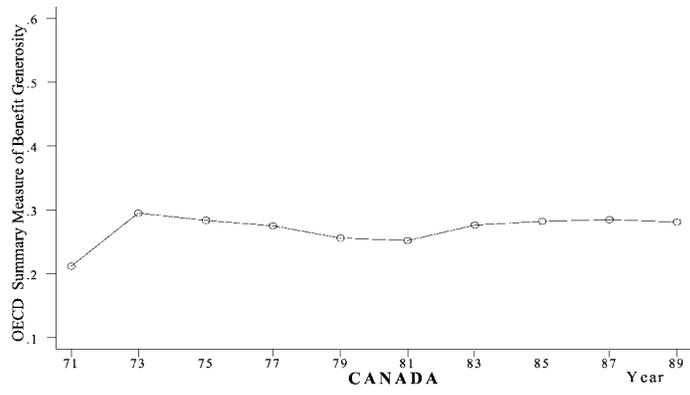


FIG. A2.—The OECD summary measure of unemployment benefits, first-year benefits, and fourth/fifth-year benefits for Canada.

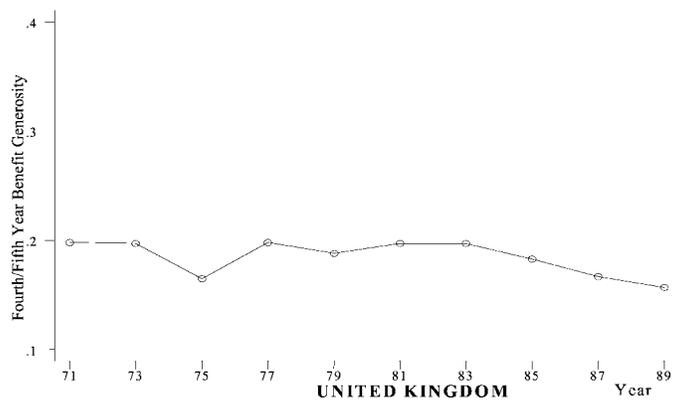
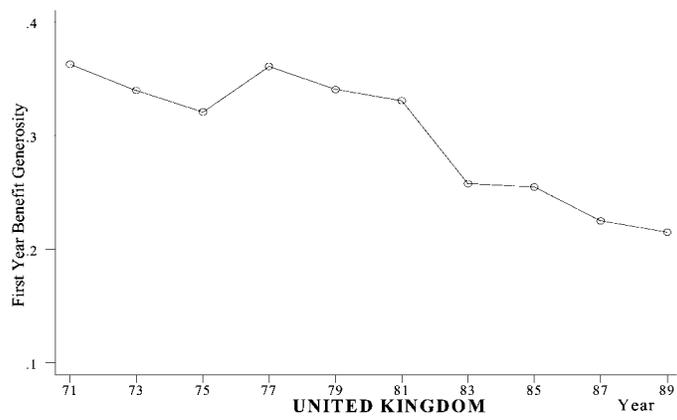
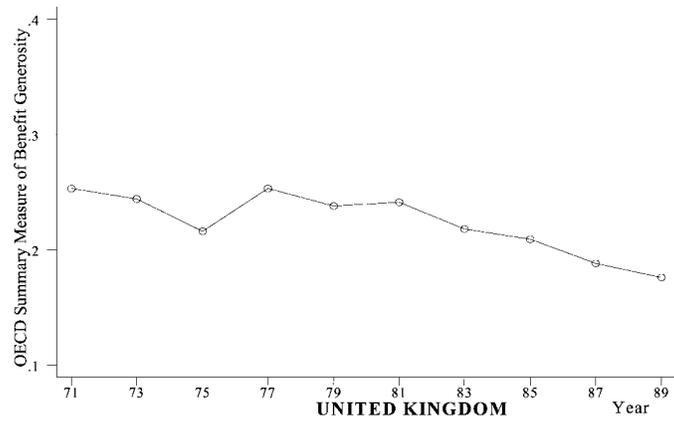


FIG. A3.—The OECD summary measure of unemployment benefits, first-year benefits, and fourth/fifth-year benefits for the United Kingdom.

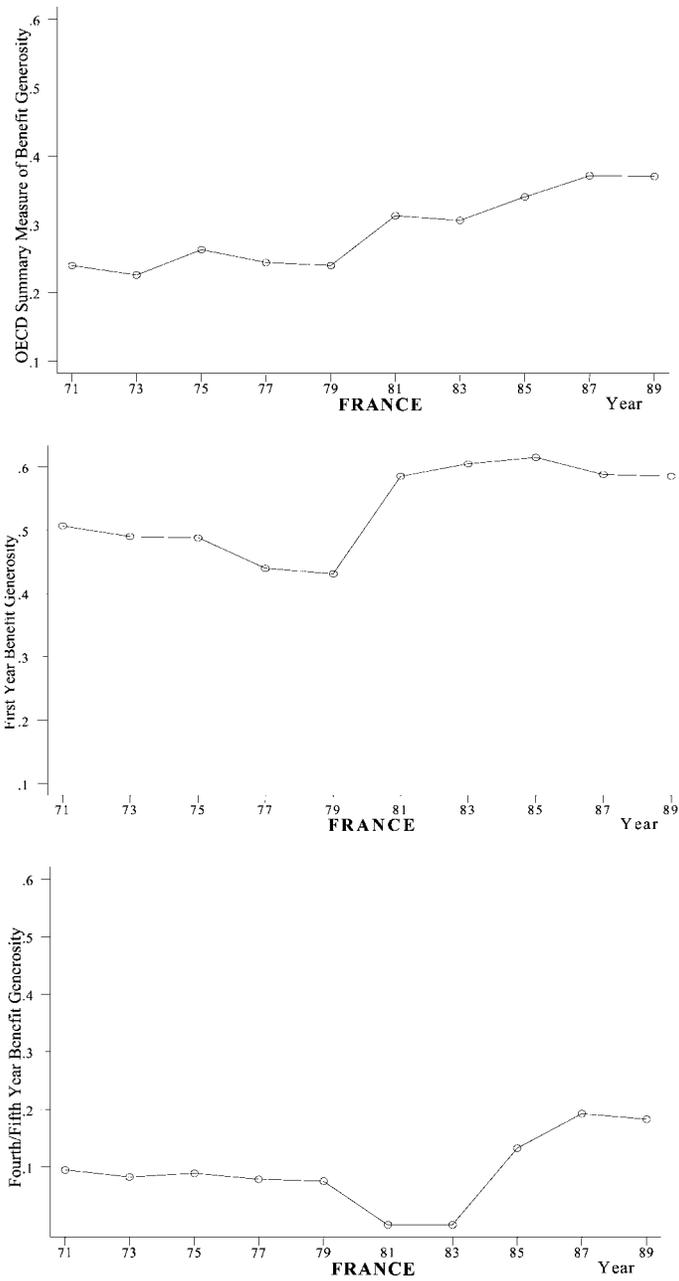


FIG. A4.—The OECD summary measure of unemployment benefits, first-year benefits, and fourth/fifth-year benefits for France.

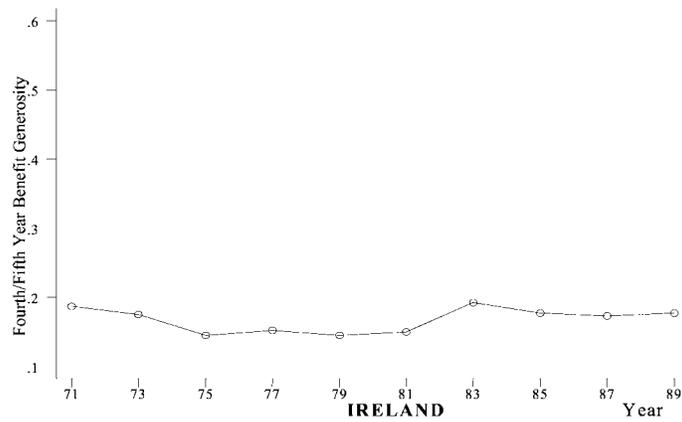
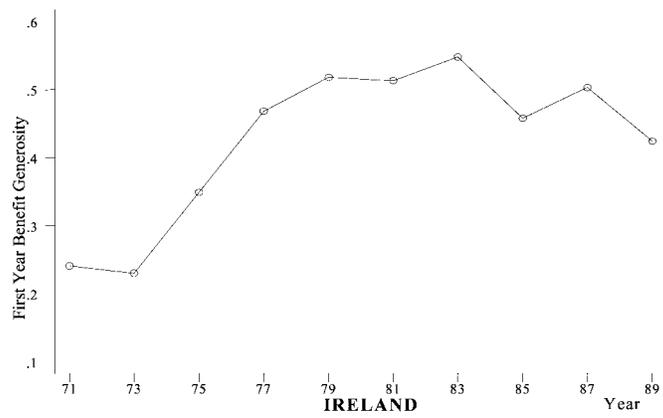
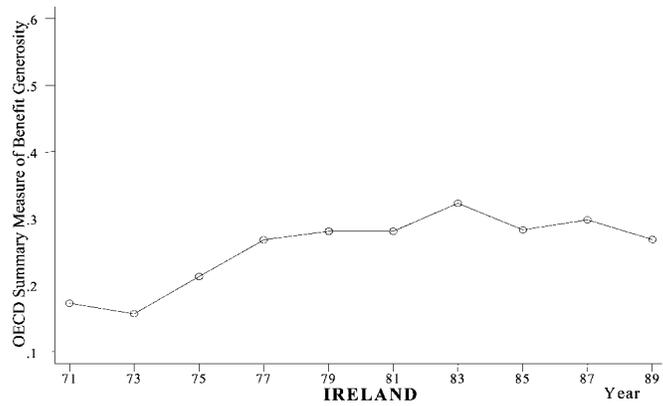


FIG. A5.—The OECD summary measure of unemployment benefits, first-year benefits, and fourth/fifth-year benefits for Ireland.

References

- Arellano, Manuel, and Bond, Stephen. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* 58 (1991): 277–97.
- Atkinson, Tony. "Income Maintenance for the Unemployed in Britain and the Response to High Unemployment." *Ethics* 100 (1990): 569–85.
- Baily, Martin. "Some Aspects of Optimal Unemployment Insurance." *Journal of Public Economics* 10, no. 3 (1978): 379–402.
- Blanchard, Olivier, and Katz, Larry. "What We Know and Don't Know about the Natural Rate of Unemployment." *Journal of Economic Perspectives* 11 (Winter 1997): 51–72.
- Boadway, Robin, and Oswald, Andrew. "Unemployment Insurance and Redistributive Taxation." *Journal of Public Economics* 20 (1982): 193–210.
- Cameron, David. "The Expansion of the Public Economy: A Comparative Analysis." *American Political Science Review* 72 (1978): 1243–61.
- Castles, Francis, and Mair, Peter. "Left-Right Political Scales: Some Expert Judgements." *European Journal of Political Research* 12 (1984): 73–88.
- Di Tella, Rafael, and MacCulloch, Robert. "The Determination of Unemployment Benefits." Applied Economics Discussion Paper no. 180. Oxford: Oxford University, Institute for Economics and Statistics, February 1995. (a)
- . "An Empirical Study of Unemployment Benefit Preferences." Applied Economics Discussion Paper no. 179. Oxford: Oxford University, Institute for Economics and Statistics, 1995. (b)
- . "A New Explanation for European Unemployment Based on Rational Institutions." Working Paper no. 01-037. Cambridge, MA: Harvard Business School, 2000.
- Ehrenberg, Ronald, and Oaxaca, Ronald. "Unemployment Insurance, Duration of Unemployment and Subsequent Wage Gain." *American Economic Review* 66, no. 5 (1976): 754–66.
- Feldstein, Martin. "The Effect of Unemployment Insurance on Temporary Layoff Unemployment." *American Economic Review* 68, no. 5 (1978): 834–46.
- Flemming, John. "Aspects of Optimal Unemployment Insurance: Search, Leisure, Savings and Capital Market Imperfections." *Journal of Public Economics* 10, no. 3 (1978): 403–25.
- Kiander, Jaakko. "Endogenous Unemployment Insurance in a Monopoly Union Model When Job Search Matters." *Journal of Public Economics* 52 (1993): 101–15.
- Layard, R.; Nickell, S.; and Jackman, R. *Unemployment*. Oxford and New York: Oxford University Press, 1991.
- Luttmer, Erzo. "Group Loyalty and the Taste of Redistribution." *Journal of Political Economy* 109 (June 2001): 500–528.
- Mackie, Thomas, and Rose, Richard. *The International Almanac of Electoral History*. 3d ed. London: Macmillan, 1982.
- OECD. *OECD Benefit Systems and Work Incentives*. Paris: OECD, 1998.

- . *OECD Historical Statistics*. Paris: OECD, various issues.
- . *The OECD Jobs Study*. Paris: OECD, 1994.
- OECD and CEP (Center for Economic Performance). Center for Economic Performance data set. London: London School of Economics, 1992.
- Oswald, Andrew. "A Conjecture on the Explanation for High Unemployment in the Industrialised Nations, Part I." Photocopied. Coventry: University of Warwick, 1997.
- Phelps, Edmund. *Structural Slumps*. Cambridge, MA: Harvard University Press, 1994.
- Ram, Rati. "Wagner's Hypothesis in Time-Series and Cross-Section Perspectives: Evidence from 'Real' Data for 115 Countries." *Review of Economics and Statistics* 69 (1987): 194–204.
- Rodrik, Dani. "Why Do More Open Economies Have Bigger Governments?" *Journal of Political Economy* 106, no. 5 (1998): 867–96.
- Saint-Paul, Gilles. "Exploring the Political Economy of Labour Market Institutions." *Economic Policy* 23 (October 1996): 265–315.
- Shapiro, Carl, and Stiglitz, Joseph. "Equilibrium Unemployment as a Worker Discipline Device." *American Economic Review* 74, no. 3 (1984): 433–44.
- Shavell, Stephen, and Weiss, Laurence. "The Optimal Payment of Unemployment Benefits over Time." *Journal of Political Economy* 87, no. 6 (1979): 1347–62.
- Strategic Services on Unemployment and Workers' Compensation. *Highlights of State Unemployment Compensation Laws*. Washington, DC: U.S. National Foundation for Unemployment Compensation and Workers' Compensation, various issues.
- U.S. Department of Health and Human Services. *Social Security Programs throughout the World*. Washington, DC: U.S. Government Printing Office, various issues.
- Warn, Ken. "No Joy as Economy Starts to Falter." *Financial Times* (July 21, 1995).
- Wright, Randall. "The Redistributive Roles of Unemployment Insurance and the Dynamics of Voting." *Journal of Public Economics* 31 (1986): 377–99.