

# Europe vs America: Institutional hysteresis in a simple normative model <sup>☆</sup>

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## Abstract

We show how the differences in US and European institutions can arise in a *normative* model. The paper focuses on the labor market and the government's decision to set unemployment benefits in response to an unemployment shock. The government balances insurance considerations with the tax burden of benefits and the possibility that they introduce adverse "incentive effects" whereby benefits increase unemployment. It is found that when an adverse shock occurs, benefits should be increased most when the adverse incentive effects of benefits are largest. Adjustment costs of changing benefits introduce hysteresis and can help explain why post-oil shock benefits remained high in Europe but not in the US. Desirable features of the model are that we obtain an asymmetry out of a symmetric environment and that the mechanism yielding hysteresis is both simple (requires the third derivative of the utility function to be non-negative) and self-correcting. Empirical evidence concerning the role of corporatism is discussed. © 2006 Elsevier B.V. All rights reserved.

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## 1. Introduction

A distinguished tradition in economics has tried to explain the differences in economic organization across Europe and America. The different historical circumstances, ranging from

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immigration to the role of the frontier, have been used to construct a variety of positive theories of economic systems. One example of this literature concerns itself with the contrasting labor market performance of the US and Europe, particularly after the oil shocks of the 1970s. In brief, unemployment rates went up in both places, but only came down in the US. Persistently high unemployment rates in Europe, or ‘Eurosclerosis’, during the 1980–90s combined with many governments’ reluctance to undertake reforms, led observers to blame ‘inflexible’ labor market institutions that were not being set to raise public welfare. Instead they were often viewed as being determined by a political economy process designed to protect the interests of one group over another. A typical example of a politically influential group is the employed majority of voters. They may gain from inflexible institutions that protect their own jobs and be *unwilling* to fund investments in resources to help get an underclass of long-term unemployed back to work.<sup>1</sup> Although capable of explaining why reforms may be blocked, this explanation on its own also predicts that the US should have experienced similar problems to Europe. Another strand of research has instead argued that the median European voter has different preferences to their US counterpart making her particularly *willing* to help the poor and unemployed. In this view European voters have a preference for institutions designed to benefit the less fortunate. Such a pattern could originate in differences in beliefs concerning the determinants of labor market outcomes (luck versus effort), or to differences in racial distance to the average welfare recipient.<sup>2</sup> However why dramatic changes occurred in these institutions during and after the oil shocks in the 1970s is not clear, especially if preferences are assumed to be slow moving.

The purpose of this paper is to study the design of the welfare state in the presence of unemployment shocks from a normative perspective in which public welfare is aggregated across *all* citizens. In particular, we present a simple model where the government sets the level of taxes on employed workers to pay out benefits to the unemployed. The economic environment implies that the current rate of unemployment depends on the generosity of benefits (due to “incentive effects”) and a shock. A key feature of our model is that, for some simple cases, we can evaluate the effects of an increase in the level of risk in the economy. Since unemployment benefits are supposed to provide insurance, the level of risk is a key parameter in the formulation of the problem. One key advantage of the model is that it is highly restrictive. It places welfare weights on the employed and unemployed that must be identically equal to their proportions in the population and makes strong identifying predictions: if unemployment rises, benefits should also rise provided insurance (*vis-à-vis* tax) effects dominate. The political economy models of, for example, Wright (1986) and Atkinson (1990) are different: they predict that benefits should always be cut whenever unemployment goes up and the government wants to keep taxes low on its supporters.<sup>3</sup> But we know of many historical episodes where unemployment benefits rise in response to an increase in unemployment even when there is a right-wing party in power. For example, during the Republican Nixon Administration from 1969 to

<sup>1</sup> See Saint-Paul’s (1996) review which argues that European labour market rigidities may exist “*simply to benefit politically powerful groups and organized interests at the expense of the rest of society.*”

<sup>2</sup> Alesina et al. (2001) document differences in beliefs and also argue that lower racial heterogeneity in Europe compared to the US (where welfare beneficiaries are disproportionately black) makes redistribution to the poor more appealing to the majority of voters. Luttmer (2001) uses General Social Survey data to show how support for benefit spending in the US is lowered by racial fragmentation.

<sup>3</sup> Neither of these models, however, considers the role of incentive effects (which can be thought of as the coefficient on benefits in an unemployment regression). Hassler et al. (1999) show how different initial distributions of human capital can yield multiple (politico-economic) steady-state equilibria: a (European) type with high unemployment/high insurance and an (American) type with low unemployment/low insurance. Saint-Paul (1996) presents a good review of positive models, and discusses other institutions, such as job security provisions.

1974, the basic measure of benefit generosity for the US rose by one fifth as unemployment increased from 3.5% to 5.6%. Surprisingly we find that the basic normative model can explain these episodes without needing to (ex-post) rationalize variations in benefits as being the result of introducing politicians and voters into a positive theory to give us more degrees of freedom (see also Grubb, 2005).

A large literature in public economics examines the optimal provision of unemployment insurance (UI). In general, however, this literature does not look at the problem of UI provision when the economy is hit by a shock that can change the level of risk in the environment. For example, there is work on how UI ought to be paid over time (e.g., Shavell and Weiss, 1979), on UI and layoff and quit behavior (e.g., Feldstein, 1978) and on UI and job search (e.g., Mortensen, 1977). Hansen and Imrohoroglu (1992) present a general equilibrium model where there are liquidity constraints and moral hazard and calculate the costs of setting a non-optimal level of UI. It cannot answer the questions we are after because the parameters that determine the unemployment rate (and that could be used to capture the level of risk in the environment) also affect the degree of risk aversion that individuals have. Thus, it is impossible to disentangle in that model what is happening because individuals have become more risk-averse and what occurs because the environment is more risky.<sup>4</sup> The idea that one could explain the high persistence of unemployment in Europe when unemployment shocks lead to increases in benefits is suggested in an influential review by Blanchard and Katz (1997).<sup>5</sup> Such a pattern is empirically plausible. Using OECD data for 1970–1990, Di Tella and MacCulloch (2002) present evidence consistent with the idea that benefits increase when there are positive changes to unemployment (an insurance effect) and fall when the unemployment level is high (a tax effect). In the present paper we formalize this intuition to show how such endogenous policies can explain two kinds of asymmetries, even in a normative model. The first is an asymmetry over time: how benefits may increase after an adverse shock and then remain up for a very long period of time. The second is an asymmetry across countries: why, once the shock disappears, benefits may drop back in some countries but not in others. Figs. 1A and 1B show how benefits varied from 1971 to 2001 in Spain and the US. Whereas in Spain benefits stayed high after the oil shock years, in the US they returned to pre-shock levels.<sup>6</sup>

We present our ideas around the concept of hysteresis. Since benefits increase the unemployment rate, hysteresis in our model occurs both with respect to policy decisions as well as with respect to unemployment. We start by formalizing the meaning of hysteresis by focusing on an objective function,  $S(b, \varepsilon)$ , where  $b$  is a choice variable (e.g., the level of benefits) and  $\varepsilon$  is a stationary random variable whose outcome is known when  $b$  is set. Changes in  $\varepsilon$  correspond to shocks. Put simply, hysteresis can exist when the value of adjusting the choice variable when a shock occurs,  $\Delta S^\varepsilon$ , is

<sup>4</sup> An interesting paper by Hassler et al. (2003) studies how shocks to the income distribution affect the support by risk-neutral workers for a welfare state whose sole purpose is to redistribute wealth. Our paper's focus is on the other standard alternative motivation for the welfare state: as a provider of the insurance that missing markets fail to provide.

<sup>5</sup> Two papers that focused on the problem of persistent European (but not US) unemployment were Blanchard and Summers (1986) and Lindbeck and Snower (1988). They argued that when wages are set unilaterally by "insiders", wage (rather than employment) gains follow the withdrawal of a temporary bad shock. When these "duration" effects are not so severe as to induce withdrawal from the labor force they are a potential source of unemployment persistence. See also Hall (1986), Lemieux and McLeod (1998), Blanchard and Wolfers (2000), *inter alia*.

<sup>6</sup> Piketty (1995) explains how differences in the welfare state, such as those that characterize Europe and the US, can arise out of a set of common fundamentals. Related papers include Benabou and Ok (2001), Benabou and Tirole (2002) and Alesina and Angeletos (2002) although this literature has not focused on differences over time. See also Fernandez and Rodrik (1991), Alesina and Drazen (1991), Pierson (1994), Moene and Wallerstein (2001), Iversen and Soskice (2001), Roland (2004) and Acemoglu and Robinson (2006).

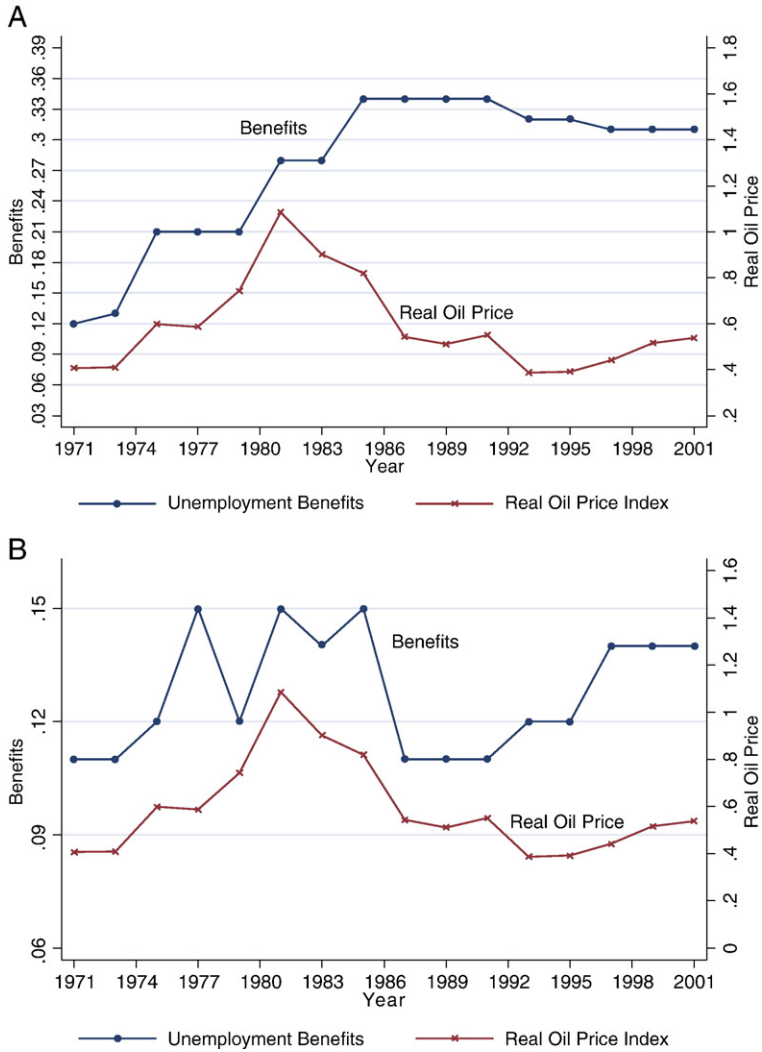


Fig. 1. (A) Spanish Unemployment Benefits (as a proportion of wages) and an Index of Real Oil Prices from 1971 to 2001 (odd years). (B) United States Unemployment Benefits (as a proportion of wages) and an Index of Real Oil Prices from 1971 to 2001 (odd years).

different from the value of adjusting back once the shock has disappeared,  $\Delta S^0$ , and there is some ‘adjustment cost’ that lies *strictly between these two values*. Note that unless strong restrictions are placed on the functional form of  $S$  to guarantee the special case in which  $\Delta S^0 = \Delta S^c$ , hysteresis as we define it here will be a pervasive feature of the world. We first show how a sufficient condition for hysteresis to exist is that the degree of concavity at the maximum of  $S(\cdot)$  changes in the presence of a shock.<sup>7</sup> This may be helpful in putting more structure to the definition of hysteresis, but as such, says

<sup>7</sup> Dixit and Pindyck (1994) study hysteresis in the context of irreversible investment. In contrast our results are not related to the option value of waiting. Hamermesh (1995) shows how hysteresis can depend on the history of labor market policies.

little about the actual time series of benefit generosity. For all we know, a formulation where economic variables are used to construct  $S(\cdot)$ , converting the objective function in our problem into a utilitarian social welfare function, could lead to all the wrong correlations. For instance, it could be that a shock that increases unemployment leads to *lower* benefits. Or it could be that hysteresis occurs only for shocks that increase social welfare. This would hardly be descriptive of the European experience after the oil shocks of the 1970s. The challenge for the second part of the paper is to show that, when  $S(\cdot)$  is a reasonable social welfare function, such as the weighted sum of the utility of the employed and unemployed, a shock that increases unemployment can reduce social welfare and lead to a permanently higher level of benefits (and unemployment) even after the shock has gone. We show that this will happen if two key conditions are satisfied. First, the degree of concavity of  $S(\cdot)$  at the point where it reaches its maximum *increases* once the adverse unemployment shock occurs. And second, the shock leads to a *higher* optimal level of benefits.

A key condition for the degree of concavity of  $S(\cdot)$  to increase with the shock is that the individual utility function has a non-negative third derivative. In other words, we require that individuals do not become more risk averse at higher income, a condition that is satisfied by most utility functions commonly used. The reason why this leads to hysteresis is because all of the effects of the shock on the concavity of  $S(\cdot)$  have the same sign for a given level of benefits. When an unemployment shock takes place, the social welfare function now incorporates some more people on benefits and loses an equal number of people on wages. As long as the replacement rate is less than one, this change will incorporate people who are on a more concave part of their utility function. A second effect is that higher benefit payments to the unemployed mean a higher tax burden. This means lower net wages, so that now the employed are also on a more concave part of the utility function.

The second condition for European-style hysteresis to exist, namely that benefits ought to be *increased* following an unemployment shock, is that the adverse incentive effects of benefits are large. The larger these incentive effects are, the more likely it is that the optimal response to a shock is to raise benefits. The intuition is simple once we note that benefits are set optimally at all times, including the moment just before the shock takes place. If incentive effects are large, benefits ought to be set low prior to the shock to minimize unemployment problems generated by the welfare state. In the limit, we can imagine a situation where unemployment is close to zero if benefits are zero. Then it is clear that the optimal benefit level prior to the shock must be zero. But after the shock occurs, the marginal gain from an extra unit of insurance becomes large. In contrast to previous models in the literature, the mechanism that yields hysteresis is no longer relevant when unemployment becomes high because tax considerations yield a self-correcting mechanism (see Hall, 1986). Furthermore, it is simple (requires the third derivative of the utility function to be non-negative) and symmetric in the sense that the same mechanism is at play in the presence of negative and positive shocks. It also does not assume any behavioral asymmetry, between insiders or outsiders or between the long-term and the short-term unemployed. The only ad-hoc feature is that it requires the existence of adjustment costs that are not modeled. Consequently we discuss the empirical evidence concerning mechanisms that may be responsible for these costs and show how they could be large enough to affect dynamics.

Although the paper deals with benefits, the results seem to have a more general application to other situations where the objective function depends on an individual's utility function. Two key features of our model – that a shock increases the concavity of the objective function and there are adjustment costs – are present in the rational design of other institutions such as job security provisions or minimum wages. Section 2 provides a definition and an outline of the general structure of rational hysteresis. Section 3 presents the general

problem in a simple economic model of optimal benefit setting and solves the simplest case with full discounting and no adjustment costs to develop the basic intuition. Section 4 includes the effect of a cost of changing the benefit level and shows how hysteresis can occur. Section 5 describes one possible empirical approach to capture these adjustment costs using work on “varieties of capitalism” (see, for example, Hall and Soskice, 2001). It describes the mechanism responsible for these costs, their origin, and provides evidence concerning how they are larger in Europe than in America and how they may be responsible for the observed differences in the speed of adjustment of unemployment benefits across OECD countries. Section 6 concludes.

## 2. Formal definition of hysteresis

Define an objective function  $S(b, \varepsilon)$  where  $b$  is a choice variable,  $\varepsilon$  is a shock and  $\partial^2 S(b, \varepsilon) / \partial b^2 < 0$ . Assume that there is a fixed adjustment cost,  $m$ , of changing  $b$ . Each period,  $b$  is set to maximize the current value of the objective function  $S(b, \varepsilon)$  minus the adjustment cost, after observing the value of the shock. Let  $b^0 = \operatorname{argmax}_b S(b, 0)$  and  $b^{\varepsilon 1} = \operatorname{argmax}_b S(b, \varepsilon 1)$ . Without loss of generality, let  $b^0 < b^{\varepsilon 1}$  and  $\varepsilon 1 > 0$ . Assume that the shock occurs and subsequently disappears. The question is whether the system returns to its initial state (i.e., no hysteresis). Fig. 2 illustrates. The gain obtained by adjusting from  $b^0$  to  $b^{\varepsilon 1}$  is  $\Delta S^{\varepsilon 1} - m = S(b^{\varepsilon 1}, \varepsilon 1) - S(b^0, \varepsilon 1) - m$  and by adjusting from  $b^{\varepsilon 1}$  to  $b^0$  is  $\Delta S^0 - m = S(b^0, 0) - S(b^{\varepsilon 1}, 0) - m$ .

### Proposition 1.

- If  $\frac{\partial^2 S(b^{\varepsilon 1} - x, \varepsilon 1)}{\partial b^2} < \frac{\partial^2 S(b^0 + x, 0)}{\partial b^2} \forall x \in (0, b^{\varepsilon 1} - b^0)$  and  $\Delta S^0 < m < \Delta S^{\varepsilon 1}$  then hysteresis exists for shocks of size  $\varepsilon 1$
- If  $\frac{\partial^2 S(b^{\varepsilon 1} - x, \varepsilon 1)}{\partial b^2} > \frac{\partial^2 S(b^0 + x, 0)}{\partial b^2} \forall x \in (0, b^{\varepsilon 1} - b^0)$  and  $\Delta S^{\varepsilon 1} < m < \Delta S^0$  then hysteresis exists for shocks of size  $-\varepsilon 1$
- If  $\frac{\partial^2 S(b^{\varepsilon 1} - x, \varepsilon 1)}{\partial b^2} = \frac{\partial^2 S(b^0 + x, 0)}{\partial b^2} \forall x \in (0, b^{\varepsilon 1} - b^0)$  then hysteresis cannot exist.

**Proof.** See Appendix B.  $\square$

Proposition 1 argues, rather trivially, that in the presence of a shock concavity at the maximum of the  $S(\cdot)$  function will increase, decrease or remain unchanged. It then shows that the first two cases yield hysteresis. Part (a) refers to the first case and proves that there is hysteresis for positive values of the shock. Part (b) refers to the second case, where the degree of concavity of the objective function falls due to the shock, and proves that hysteresis will exist for negative values of the shock. In both cases adjustment costs must lie in the specified range. Note that, because we are making comparisons at two different values of the choice variable, a condition on the change in concavity at a given point is enough only in the cases where  $|b^{\varepsilon 1} - b^0|$  is sufficiently small. What is required in the general case is a comparison of concavity of the original function around its maximum and concavity of the new function around the new maximum. This is what the terms  $b^0 + x$  and  $b^{\varepsilon 1} - x$  refer to. Less formally, hysteresis exists when the objective function becomes more sharply “peaked” in the presence of the shock. Only in the rare case that there is no change in concavity (e.g., the objective function has the form,  $Q(b) + \varepsilon b$ , where  $Q(b)$  is quadratic) can there be no hysteresis.

The conditions required in Proposition 1 for hysteresis to occur could be satisfied by a large number of functional forms. However we still must check that it can hold for a social welfare function:  $S(b, \varepsilon) = SW(b, u, T, \varepsilon)$  where  $b$  is the level of unemployment benefits,  $u = f(b, \varepsilon)$  is the unemployment rate and  $T = g(b, u)$  is the level of taxes. More importantly, once economic

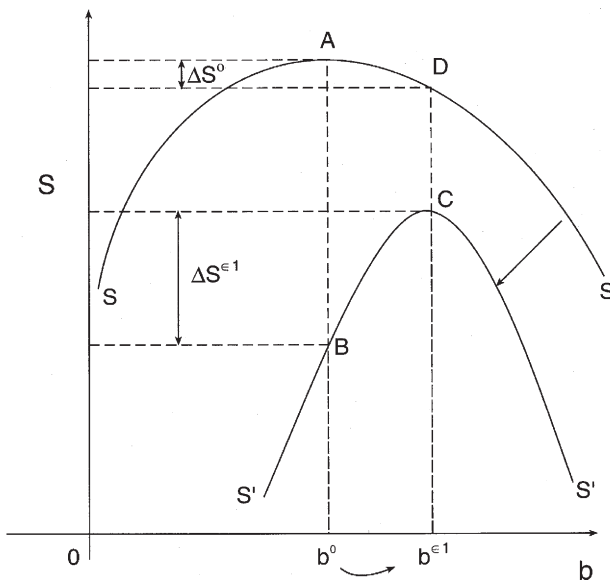


Fig. 2. The objective function,  $S(b, \epsilon)$ , versus the choice variable,  $b$ , before a shock ( $SS$ ) and during an adverse shock ( $S'S'$ ).

relationships are considered, nothing leads us to expect that hysteresis will occur with the correct co-variation in the variables, in the sense that they are compatible with the European experience. For example, none of the cases covered by part (b) of Proposition 1 will do because European unemployment is not associated with a shock that *reduced* unemployment. Furthermore, a shock that increases unemployment could easily lead to a lower level of optimal benefits. In other words, nothing precludes that in Fig. 2 the function with the shock,  $S'S'$ , has a maximum to the left of  $b^0$ . Put differently, we ask if the predictions in our model are compatible with the observation that an adverse temporary shock can leave benefits (and unemployment) at a higher level and social welfare at a lower level than prior to the shock. This is the challenge for the rest of the paper.

### 3. A simple model of unemployment benefit determination

#### 3.1. Individual preferences

Assume an economy populated with identical risk-averse individuals with strictly concave utility defined over income,  $U(i)$  (where  $U'(i) > 0$  and  $U''(i) < 0$ ). Individuals cannot save or insure themselves in private insurance markets.<sup>8</sup> The unemployment benefit program pays  $b_t w$  to the unemployed (where  $0 \leq b_t \leq 1$  is the replacement rate and  $w$  is the gross wage) funding it with a tax equal to  $T_t$  levied on employed individuals at time,  $t$ .

#### 3.2. Labor market

At any point in time we denote the unemployment rate,  $u_t = f(b_t, \epsilon_t)$ , where  $\epsilon_t$  is a random, stationary shock with three outcomes ( $0, \epsilon_1, \epsilon_2$ ) with probabilities ( $p, q, 1-p$

<sup>8</sup> Chiu and Karni (1998) explain the role of private information in the failure of private insurance markets.

–*q*). Unemployment depends positively on the shock and the generosity of the benefit program.<sup>9</sup>

### 3.3. The government's problem

At  $t=0$  the initial level of benefits is set. At time  $t=1, 2, \dots$  a shock occurs that is random but known when benefits can be reset at time,  $t$ , though there is an adjustment cost,  $m_t$ , if the level of benefits is changed.<sup>10</sup> This cost is defined in utils and could be due to administrative costs and the coordination costs that are incurred if political support for such changes is required. The government must pay the same cost both when it wants to increase benefits and when it wishes to cut them.

After observing the shock, the government's problem is to set benefits to maximize the present discounted value of expected welfare, conditional on information at time  $t$ , subject to the budget constraint, the possibility that higher benefits may cause higher unemployment and the adjustment costs. If the social rate of time preference equals  $\theta$ , the government's problem as of time zero is:

$$\max_{b_0, b_1, \dots} E \left[ \sum_{t=1}^{\infty} \frac{SW_t - M_t}{(1 + \theta)^t} \mid t = 0 \right] \tag{1}$$

subject to

$$u_t = f(b_t, \varepsilon_t) \quad \text{Incentive Constraint} \tag{2}$$

$$T_t = \frac{u_t b_t w}{1 - u_t} \quad \text{Budget Constraint} \tag{3}$$

$$M_t = \begin{cases} m_t \geq 0 & \text{if } |b_t - b_{t-1}| \neq 0 \text{ for } t \geq 1 \\ 0 & \text{if } |b_t - b_{t-1}| = 0 \text{ for } t \geq 1 \end{cases} \quad \text{Adjustment Costs} \tag{4}$$

where  $SW_t = u_t U(b_t w) + (1 - u_t) U(w_t^n)$  and  $w_t^n = w - T_t$  is the net wage. Substituting in  $SW_t$  for constraints (2) and (3) yields  $S(b_t, \varepsilon_t)$ . This formulation implies the simplest assumption regarding transitional dynamics: each period the government ignores the employment history.

<sup>9</sup> This can be derived from a variety of standard models of equilibrium unemployment, including an efficiency wage model, a union bargaining model or a search model. The following example illustrates. Assume firms pay workers a gross wage,  $w$ , and competition ensures zero profits:  $\pi(w) = 0$  where  $\partial \pi / \partial w < 0$ . Assume workers can either exert effort or 'shirk' but are fired if caught. Expected income after being fired is the probability of staying unemployed ( $= a(U_t)$  where  $U_t$  is the unemployment rate and  $\partial a / \partial U_t > 0$ ) multiplied by the level of benefits, plus the probability of finding a new job ( $= 1 - a(U_t)$ ) multiplied by wages (net of tax and effort costs). The "No-Shirking-Condition" equates the value from exerting effort to the value of shirking:  $C(w, b_t, U_t, \varepsilon_t) = 0$  where  $\partial C / \partial w > 0$ ,  $\partial C / \partial b_t < 0$ ,  $\partial C / \partial U_t > 0$ ,  $\partial C / \partial \varepsilon_t < 0$ . Equilibrium unemployment,  $u_t$ , can then be expressed as a function of benefits and the shock ( $u_t = f(b_t, \varepsilon_t)$  where  $\partial f / \partial b_t > 0$ ,  $\partial f / \partial \varepsilon_t > 0$ ).

<sup>10</sup> This assumption about timing ensures that, for the cases we study, the level of unemployment is the relevant measure of 'risk' in the economy.



Thus, a situation where a person is unemployed for two periods is identical to the situation where that person is unemployed for one period and another is unemployed the next.<sup>11</sup> If we define the value function as:

$$V(b_{t-1}, \varepsilon_t) = \max_{b_t, b_{t+1}} \dots E \left[ \sum_{s=t}^{\infty} \frac{S(b_s, \varepsilon_s) - M_s}{(1 + \theta)^{s-t}} | t \right] \tag{5}$$

then the solution to the government’s problem satisfies:

$$V(b_{t-1}, \varepsilon_t) = \max_{b_t} \{ S(b_t, \varepsilon_t) - M_t + (1 + \theta)^{-1} E[V(b_t, \varepsilon_{t+1}) | t] \} \tag{6}$$

This Bellman equation fully characterizes the solution to the government’s unemployment benefit problem. More intuition can be gained, however, by examining the government’s problem in special cases, such as when there is full discounting or when adjustment costs are zero.

### 3.4. Basic results with full discounting and no adjustment costs

As is standard in this type of problem, it is useful to start by assuming that only current period welfare is valued and there are no adjustment costs. The problem reduces to:

$$\max_b SW(b, u, T, \varepsilon) = (1-u)U(w-T) + uU(bw) \tag{7}$$

subject to

$$u = f(b, \varepsilon) \quad \text{Incentive Constraint} \tag{8}$$

$$T = \frac{ubw}{1-u} \quad \text{Budget Constraint} \tag{9}$$

The First Order Condition (FOC) is:

$$-(1-u)U'(w^n) \left[ \frac{u}{1-u} + \frac{b}{(1-u)^2} \frac{\partial u}{\partial b} \right] + uU'(bw) - \frac{1}{w} \frac{\partial u}{\partial b} [U(w^n) - U(bw)] = 0 \tag{10}$$

When the second order condition holds, the FOC implicitly defines optimal benefits as a function of the magnitude of incentive effects,  $\partial u / \partial b$ . Clearly if there are no adverse incentive effects of benefits, marginal utility must be equalized across states and there is simply full insurance. Inspection of the FOC suggests that incentive effects will sometimes reduce the optimal level of benefits. For simplicity, assume that incentive effects are linear and the shock is additive.<sup>12</sup> At each point in time, let  $u = u^f + \alpha b + \varepsilon$ , which equals the sum of frictional unemployment,  $u^f$ , unemployment arising from the adverse incentive effects of benefits,  $\alpha b$ , and the random shock,  $\varepsilon$ .<sup>13</sup>

<sup>11</sup> The same social welfare function (divided by the discount rate) is obtained if we add the lifetime expected utility of employed and unemployed workers, used in Shapiro and Stiglitz (1984). For transitional dynamics, see Kimball (1994).

<sup>12</sup> A sufficient condition for the Second Order Condition to hold under these conditions is  $\alpha \leq u^f$ . It is possible to derive some of the results below for other cases as well, available on request.

<sup>13</sup> This makes two simplifying assumptions. First, a linear approximation is used. Second, the specification assumes that the shock does not directly affect labor market ‘incentives’ (i.e.,  $\partial^2 u / \partial \varepsilon \partial b = 0$ ). The reason is that we seek to provide the simplest environment where hysteresis will emerge out of a normative process. Whereas a more detailed model of the labor market may allow for the possibility that the effect of the shock on  $\partial u / \partial b$  is non-zero, there is no reason to believe that it *must* be so. For details and empirical evidence on benefit determination, see Di Tella and MacCulloch (2002).

**Proposition 2.** The government should set benefits low when incentive effects are large.

**Proof.** Compute  $db/d\alpha < 0$ , using the implicit function rule on the FOC (10). □

The intuition is as follows: at the optimum, the government balances insurance against the tax costs to fund the program as well as the adverse incentive effects that benefits introduce (which increase unemployment). When incentive effects are large the government will try to restrict benefits because, for a given level of insurance, they now have a bigger effect on the unemployment rate and tax burden of the employed. As a reference, note that the majority of Americans believe that the poor are lazy, as opposed to unlucky, whereas the opposite is true in Europe (see Alesina et al., 2001 and Section 5.2 for more evidence on beliefs). We now study what happens to the optimal level of benefits when there is an exogenous shock to unemployment.

**Proposition 3.**

- a. When incentive effects are small, the government should reduce benefits following the occurrence of an adverse shock.
- b. When incentive effects are large, the government should increase benefits following the occurrence of an adverse shock.

**Proof.** See Appendix B. □

If there are only small incentive effects of benefits on unemployment, benefits should decrease due to exogenous adverse shocks to unemployment. The reason is that benefits should initially be set at relatively generous levels (close to the wage) when  $\alpha$  is small so that the main impact of the shock is to raise taxes (via the budget constraint) and reduce the affordable level of benefits. Fig. 3 illustrates the results in both Propositions 2 and 3.

Perhaps the more interesting case is when incentive effects are large. Initially benefits are set at relatively low levels and the optimal response to an adverse shock may be to *increase*, rather than reduce, benefits since increases in insurance now have large positive marginal welfare effects. Consider an example where utility is logarithmic. If  $U(x) = \log x$  then pre-shock welfare is  $S(b, 0) = u \log bw + (1 - u) \log w[1 - ub / (1 - u)]$  where  $u = u^f + ab$ . This can be re-expressed as

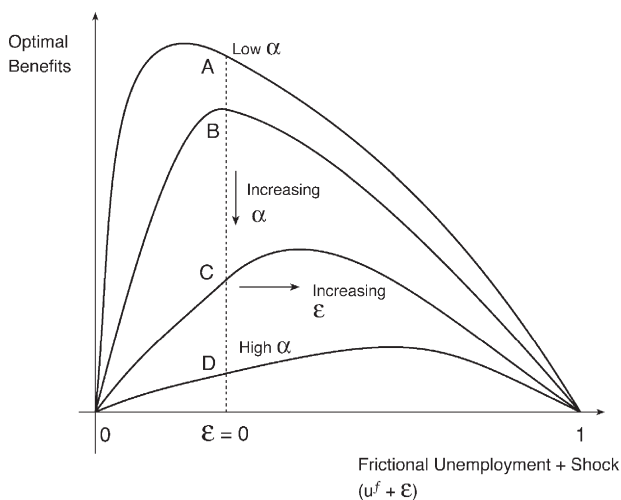


Fig. 3. The benefit curve, describing how the optimal level of benefits depends on the size of unemployment shock, drawn for different levels of incentive effects,  $\alpha$ .

$S(b, 0) = \log w + u \log b + (1 - u) \log [1 - ub / (1 - u)]$ . If benefits are low then taxes are low and hence  $S(b, 0) \approx \log w + u(\log b - b)$ . In the presence of a shock,  $\varepsilon 1$ , to unemployment,  $S(b, \varepsilon 1) \approx S(b, 0) + \varepsilon 1(\log b - b)$ . The second term has a positive derivative with respect to  $b$ , equal to  $\varepsilon 1(1/b - 1)$ . Hence if benefits were being set optimally before the shock occurred, well below the wage due to high incentive effects, there is now a positive marginal welfare gain from more insurance. The smaller is the initial level of benefits, the larger is the gain from adjusting.

A simple quantitative analysis highlights the empirical plausibility of these effects. In Spain between 1975 and 1983 unemployment rose from 5% to 18%. Over the same time period the benefit replacement rate rose from 0.21 to 0.36. Average earnings in 1975 were \$US 9433 (at 1990 exchange rates and prices from OECD Historical Statistics). An estimate of the incentive effects of benefits,  $\alpha$ , is 0.15 (which falls within the range provided by Krueger and Meyer, 2002). Let the welfare function be defined as  $u \log(bw) + (1 - u) \log(w - ubw / (1 - u))$  and parameterize the model with  $w = 9433$ , pre-shock unemployment =  $0.03 + 0.15b$  and adverse-shock unemployment =  $0.03 + 0.08 + 0.15b$  (so the size of the underlying shock to unemployment equals 8%). Then the pre-shock optimal level of benefits is  $b^0 = 0.16$  and the adverse shock optimal level is  $b^{\varepsilon 1} = 0.40$ . At these levels of benefits the initial level of unemployment is 5% and the adverse shock level increases to 18%, which both match the actual figures (see above). See the appendix for a calibration of the graph from Fig. 2 for this case.

A fundamental aspect of this problem is that the effect of an adverse shock on the objective function (social welfare) is to increase its degree of concavity for a given value of benefits. In other words, the second derivative of the welfare function, with respect to benefits, becomes more negative in the presence of the shock.

**Proposition 4.** Provided  $U'''(w^n) \geq 0$  then

$$\frac{\partial^2 S(b, \varepsilon 1)}{\partial b^2} < \frac{\partial^2 S(b, 0)}{\partial b^2} \quad \forall b, \forall \varepsilon 1 > 0 \tag{11}$$

**Proof.** See Appendix B.  $\square$

There are several effects that give rise to this result. First, an adverse shock shifts a proportion of workers from employment to unemployment. Once unemployed they find themselves on a lower part of their utility function (where  $U'''$  is more negative) since now only earn the benefit (which is lower than the wage). Second, an adverse shock cuts the level of net wages by lowering the gross wage that workers are paid and by increasing the level of taxes due to the greater numbers of unemployed. Hence even those workers who stay employed are pushed onto a lower part of their utility function (where  $U'''$  is more negative). Third, the greater numbers of unemployed due to the shock mean that higher benefits have increasingly more severe effects on taxes, which also makes the second derivative of the welfare function more negative.<sup>14</sup> In most cases, this result of concavity increasing at a given  $b$  is enough to guarantee an increase in the degree of concavity at the top of the welfare function once the adverse shock occurs. In some cases, however, the shock may induce a too large change in benefits. It is theoretically conceivable that a large change in benefits could affect the degree of concavity at the top of the welfare function by adding a term with the wrong sign (e.g., if the shock induces an increase in benefits that moves the unemployed to a less concave part of their utility function). It is to avoid these pathological cases that we will impose a restriction ‘for a small change in benefits’.

<sup>14</sup> This last effect means that even when  $U'''(w^n) = 0$  the social welfare function would become more concave after the shock. To see this note that in the quadratic utility example (i.e.,  $U(w^n) = cw^n - d(w^n)^2$  where  $w^n = w(1 - ub / (1 - u))$ ) the second derivative with respect to  $b$  becomes more negative when the unemployment rate is higher.

For the logarithmic utility example where incentive effects are large so benefits are initially set low, the expression for  $\partial^3 S / \partial \varepsilon \partial b^2$  is dominated by the negative term,  $-1/b^2$ . This term captures the degree of concavity of the utility function,  $U(bw) = \log bw$ , of the workers who are made unemployed due to the shock. More generally, Fig. 2 shows the case when incentive effects are large. Welfare varies with benefits along the curve  $SS$  in the absence of a shock. The optimal level of benefits is set relatively low at  $b^0$ . Social welfare is  $S(b^0, 0)$  at point A. This figure also shows the impact of a shock to unemployment,  $\varepsilon_1 > 0$ . Welfare now varies with benefits along the curve  $S'S'$ . From Proposition 3 (b) we know that the optimal level of benefits rises to  $b^{\varepsilon_1}$  and welfare equals  $S(b^{\varepsilon_1}, \varepsilon_1)$  at point C. From Proposition 4 we know that, for a given  $b$ , the degree of concavity of the post-shock welfare function,  $S'S'$ , is greater than the degree of concavity of the pre-shock function,  $SS$ .

### 3.5. Results without full discounting and no adjustment costs

Assume that the government positively weights welfare in future periods and the adjustment cost is zero. The solution to problem (1) remains the same as in Section 3.4 since benefits should be set each period at the level that maximizes  $S(b, \varepsilon_t)$ .

## 4. Optimal benefits with positive adjustment costs

We now assume that there exists a positive fixed cost of adjusting benefits.

**Proposition 5.** Assume possible outcomes for the shock are  $(0, \varepsilon_1, \varepsilon_2)$  with probabilities  $(p, q, 0)$  and there is a sufficiently large adjustment cost to stop benefits changing as  $\varepsilon$  varies between 0 and  $\varepsilon_1$ . Then benefits should be set at a level that tends to  $b^{\varepsilon_1}$  as the concavity of  $S(b, \varepsilon_1)$  increases.

**Proof.** The optimal strategy is to set benefits at a level that satisfies the FOC:

$$-p \frac{\partial S(b, 0)}{\partial b} = (1-p) \frac{\partial S(b, \varepsilon_1)}{\partial b} \quad (12)$$

which equates the expected marginal social welfare gain from changing benefits across the two states of nature. If the concavity of  $S(b, \varepsilon_1)$  becomes large then  $\partial S(b, \varepsilon_1) / \partial b$  becomes large (for any level of benefits between  $b^0$  and  $b^{\varepsilon_1}$ ) so to maintain the FOC,  $b \rightarrow b^{\varepsilon_1}$ .  $\square$

Eq. (12) shows how the possibility that shocks might occur affects the optimal level of benefits. Dynamic optimization dictates that benefits will be determined (almost) by the shape of the welfare function in the adverse state of nature (i.e., when  $\varepsilon = \varepsilon_1$ ). The reason is that if benefits are not able to be changed in future periods due to high adjustment costs, then the cost of not setting benefits close to  $b^{\varepsilon_1}$  becomes high since the welfare function is relatively flat when  $\varepsilon = 0$  and relatively concave when  $\varepsilon = \varepsilon_1$ . Consequently in the presence of a shock that has only two possible outcomes, it becomes optimal to set benefits at a level that tends to  $b^{\varepsilon_1}$  the greater is the concavity of  $S(b, \varepsilon_1)$ . For there to be hysteresis, there must be a positive probability of a third shock,  $\varepsilon_2$ , occurring:

**Proposition 6.** Assume possible outcomes for the shock are  $(0, \varepsilon_1, \varepsilon_2)$  with probabilities  $(p, q, 1-p-q)$  where  $p > 0, q > 0, 1-p-q > 0$  and  $b^0 < b^{\varepsilon_1} < b^{\varepsilon_2}$ . Then for sufficiently large adjustment costs, hysteresis is possible when  $\varepsilon$  varies from 0 to  $\varepsilon_1$ , and from  $\varepsilon_1$  to  $\varepsilon_2$ .

**Proof.** See Appendix B.  $\square$

The intuition is as follows. Let benefits be ‘stuck’ close to, or at,  $b^{\varepsilon_1}$  so that they are not changed as the shock varies between 0 and  $\varepsilon_1$  due to the cost of adjustment. However, unlike the two outcome case, once there is an even larger adverse shock,  $\varepsilon_2$ , it may become optimal to change benefits if

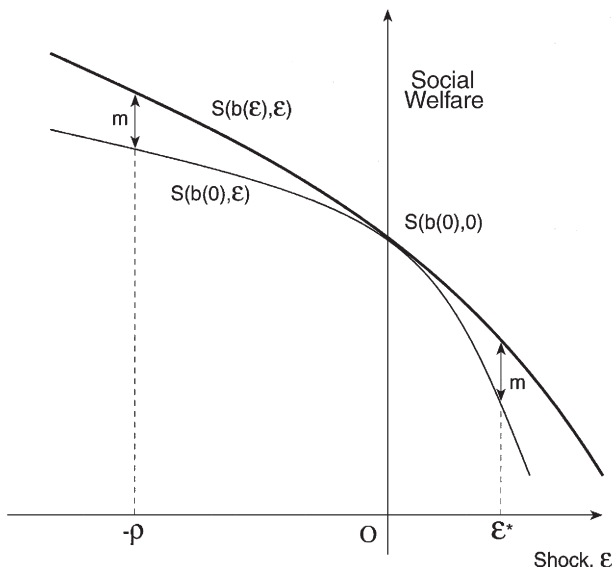


Fig. 4. Social Welfare vs the Shock.  $S(b(\epsilon), \epsilon)$  is the envelope over which benefits are changed optimally depending on the size of shock. If the adjustment cost is  $m$ , the region of inaction is  $(-\rho, \epsilon^*)$ .

there is a large enough welfare gain to be captured by moving up toward  $b^{\epsilon 2}$ . This is possible since the welfare function becomes more concave (and shifts further to the right) as the shock increases from  $0 \rightarrow \epsilon 1 \rightarrow \epsilon 2$ . Remaining at  $b^{\epsilon 2}$  as the shock varies between  $\epsilon 1$  and  $\epsilon 2$  may also be optimal to avoid adjustment costs but once the best state of nature occurs (i.e.,  $\epsilon = 0$ ) it again becomes worthwhile to change if the potential gain (i.e.,  $S(b^0, 0) - S(b^{\epsilon 2}, 0) - m$ ) is sufficiently large. Consequently hysteresis is possible for the sequence of shocks  $(0, \epsilon 1, 0)$  and  $(\epsilon 1, \epsilon 2, \epsilon 1)$ ; but not  $(0, \epsilon 2, 0)$ .

#### 4.1. Characterization of the degree of hysteresis

The purpose of this section is to characterize the amount of hysteresis in the economy.<sup>15</sup>

**Definition 1.** If  $\rho$  and  $\epsilon^*$  are two shocks such that:

$$S(b(-\rho), -\rho) - S(b(0), -\rho) = m = S(b(\epsilon^*), \epsilon^*) - S(b(0), \epsilon^*) \tag{13}$$

then the degree of hysteresis in the economy,  $\eta$ , can be characterized by:

$$\eta = \left| \frac{b(-\rho) - b(0)}{b(\epsilon^*) - b(0)} \right| \tag{14}$$

Given the uncertainty structure, this measure best captures the asymmetric range of inaction of the government when it sets benefits. When  $\eta$  is larger than 1, it reflects the asymmetry resulting from the increase in the concavity of the social welfare function in the presence of an unemployment shock. The more the degree of concavity rises, the larger  $\eta$  becomes. The smaller the change in concavity, the closer  $\eta$  is to one. The nature of this measure can be seen in Fig. 4 which is drawn for the case of large incentive effects when only current period welfare is valued. It shows two functions,

<sup>15</sup> We thank Fernando Alvarez for helping to develop the ideas below. Errors are our own.

both of which define social welfare (without adjustment costs) as a function of the size of the shock,  $\varepsilon$ . The function,  $S(b(\varepsilon), \varepsilon)$ , depicted by the thick line, shows how welfare changes when benefits vary optimally so as to maximize  $S(\cdot)$  for each level of  $\varepsilon$ . In other words, if  $b(\varepsilon) = \text{argmax}_b S(b, \varepsilon)$  then:

$$\frac{dS(b(\varepsilon), \varepsilon)}{d\varepsilon} = \frac{\partial S(b, \varepsilon)}{\partial b} \frac{\partial b}{\partial \varepsilon} + \frac{\partial S(b, \varepsilon)}{\partial \varepsilon} = \frac{\partial S(b, \varepsilon)}{\partial \varepsilon} \tag{15}$$

by the Envelope Theorem. The function,  $S(b(0), \varepsilon)$ , depicted by the thin line, shows how  $S(\cdot)$  varies with  $\varepsilon$  when benefits are fixed at the level,  $b(0) = \text{argmax}_b S(b, 0)$ . These two functions are tangential when  $\varepsilon = 0$ . For other values of the shock,  $S(b(0), \varepsilon) < S(b(\varepsilon), \varepsilon)$ . If benefits are set initially at  $b^0$  then the increase in welfare obtained from changing the level of benefits when there is an adjustment cost of size,  $m$ , equals  $S(b(\varepsilon), \varepsilon) - S(b(0), \varepsilon) - m$ . This is the motivation for the definition of  $\eta$ .

Fig. 5 draws the same problem, but in  $(\varepsilon, b)$  space. The thick line,  $b(\varepsilon)$ , describes how benefits vary optimally so as to maximize  $S(\cdot)$  for each level of the shock,  $\varepsilon$ . It is upward sloping since we are focusing on the case where incentive effects of benefits are large (see Proposition 3(b)). The thin lines depict the limits of the regions of inaction. In the absence of a shock, benefits are set optimally at  $b(0)$ . In the presence of a shock that is between  $-\rho$  and  $\varepsilon^*$ , benefits should not be changed due to the adjustment cost. In Fig. 5,  $\eta$  is the vertical distance between points D and F divided by the vertical distance between points A and B. (If there are no changes in concavity between points F and B then these two distances must be the same). Consider the example of a shock that is marginally larger than  $\varepsilon^*$ . Benefits should be increased from  $b(0)$  to  $b(\varepsilon^*)$  (from points A to B). Once the shock has disappeared, benefits should be kept at  $b(\varepsilon^*)$ . Only if a shock reduces unemployment by more than the level measured by the horizontal distance between points O and C should benefits be cut.

### 5. The source and size of institutional adjustment costs

Our model emphasizes the idea that countries incur costs in adjusting their institutions. In this section we present evidence that these costs are higher in Europe than in the US by focussing on a type of adjustment cost that has been discussed in the literature on “varieties of capitalism” (see, for example, Hall and Soskice, 2001, and the references cited therein). In particular, this work

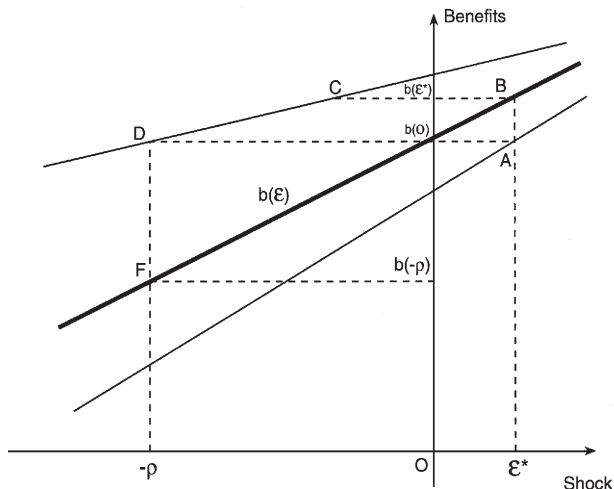


Fig. 5. The Optimal Unemployment Benefit Setting Rule. Segment DA denotes the (asymmetric) region of inaction.

documents how Europe and America differ in their social organization along a number of dimensions, one of which is the number of agents involved in making decisions over welfare policy. Under the assumption that decisions involving larger number of players are more costly, this informs our model in terms of three important aspects. First, it presents a mechanism that others have discussed as affecting social policy. Importantly, the evidence suggests that this mechanism involves higher costs of changing institutions in Europe than in the US. Second, work in this literature traces these differences to forces that are plausibly exogenous, namely values, forms of political representation and country size. Third, the magnitude of these differences appears to be sufficiently large to explain a significant part of the observed differences in adjustment.

### *5.1. The source of adjustment costs to the welfare state*

The literature on institutional economics has characterized political markets as involving high transaction costs. For example, North (1990) states that “A transaction cost theory of politics is built on the assumptions of costly information, of subjective models on the part of the actors to explain their environment, and of imperfect enforcement of agreements. Choices employing such models result in high political transaction costs that make political markets very imperfect.” One reason invoked by North for these high transaction costs is that it is difficult to measure what exactly is being exchanged and thus to enforce agreements surrounding them.

Decisions over welfare policy are a prominent example of such political decisions. A number of authors have characterized welfare regimes across industrialized countries. A well-known criterion involves the extent to which, broadly speaking, policies in this realm are determined through a cooperative process. Indeed, as defined in Hicks (1988) democratic corporatism has three traits. One is a strategy of social partnerships deemed necessary for “mitigating class conflict and averting policy making logjams”. The second trait is an encompassing system of interest group organizations with wide coverage of producers and workers “yet in which the principal actors are few enough in number to engage in meaningful negotiations”. The third trait is the informal coordination of conflicting objectives through continuous negotiations between interest groups, political parties and the bureaucracy. See also the discussions in Katzenstein (1985), Esping-Anderson (1990) and Hall and Soskice (2001).<sup>16</sup>

Some of the more significant corporatist institutions, particularly those concerned with macro-level collective action, involve employer associations, union confederations and States. Goodin et al. (1999) explain further the connection between the objectives of corporatism and the demand for cooperative institutions involving many players: “The practical implementation of this theory will no doubt involve a fair bit of horse trading and interplay of sectoral interests, as the leaders of the ‘peak associations’ representing all these groups get together to haggle over details of proposed solutions to various social and economic problems. In corporatist-style interest group intermediation, negotiations are conducted under a decision rule of (rough) unanimity rather than merely majority rule. No one (or virtually no one) will be left out; broadly speaking, all major groups in society have to agree (Schmitter and Lehbruch, 1979). Wage bargaining, most conspicuously, is done this way in a corporatist community. But all other major decisions – economic and otherwise – are ideally supposed to be handled this way.”

Although, as discussed in Hicks and Kenworthy (1998), such arrangements vary in the amount of government support and ideological tradition, all our available classifications rank Europe as

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<sup>16</sup> Consistent with this, Marks (1986) discusses how corporatist regimes affect policy formulation, policy scope and policy implementation. He states that an important question is to understand the conditions under which corporatist regimes keep the number of organized bargaining agents in the relevant sphere of policy to manageable proportions.

more corporatist than America. As an illustration, we present below a broad index of corporatism from Lijphart and Crepaz (1991) which aggregates a maximum of 12 different measures of corporatism (and a minimum of six) calculated in the literature during the period 1976–1986 (corresponding to the situation in the countries covered for the period leading up to and including the early 1970's). We also present a more narrow construct of government-interest group cohesiveness and importance from Hicks and Kenworthy (1998) for 1960–1989.

#### Differences in Institutional Corporatism between the US and Europe

	Corporatism 1	Corporatism 2
United States	-1.34	0
Europe	0.37	0.77
Austria	1.6	1
Belgium	0.26	1
Denmark	0.52	1
Finland	0.43	1
France	-0.72	1
Germany	0.48	1
Ireland	-0.53	0
Italy	-0.85	0.5
Netherlands	1.01	1
Norway	1.53	1
Sweden	1.40	1
United Kingdom	-0.83	0

Note: Corporatism 1 is the index of corporatism in Table 1 of Lijphart and Crepaz (1991). Corporatism 2 is the index of cohesive government/interest group interrelations from Hicks and Kenworthy (1998).

Finally, it is worth mentioning that Goodin et al. (1999) suggest that this view of more layers and wider involvement in the case of European countries (compared to fewer in the US) is true even when more detailed administration of social programs is considered. Although presumably these administrative costs are only a fraction of the transaction costs mentioned above, Goodin et al. point out that in the US the administration of the unemployment insurance program is carried out by Federal and State governments. In the case of the Netherlands, the administration of unemployment insurance is carried out by National government and industry associations with tripartite memberships. Finally, in Germany, the administration is carried out by the federal government through regional/local offices managed by tripartite boards and committees.

#### 5.2. The origins of the difference in adjustment costs

The literature on “American exceptionalism” has emphasized that values and beliefs in America, in contrast to Europe, stress the value of self-reliance, individualism and the belief in upward mobility through effort and merit (the “American dream”, whereby the poor are lazy rather than unlucky). This is important for our purposes because welfare regimes have been classified according to the way they group particular values and policies (Titmuss, 1958; Esping-Anderson, 1990; Goodin et al., 1999, *inter alia*). This suggests that countries have different organizations depending on the prevailing values and beliefs, which derive from long standing historical roots, including the frontier and immigration.

Goodin et al. state that the US is considered the archetype example of a “liberal welfare regime”, where the fundamental organizing value is that of a state that is neutral amongst competing conceptions of what must be done and policies seek to equalize opportunities. In contrast, European countries are classified either as “social democratic welfare regimes”, where the fundamental value is



social equality, or as “corporatist welfare regimes” where the fundamental value is social cohesion. An example of the former category is The Netherlands, where there is little tolerance for unequal outcomes. Goodin et al. state that this principle may even mandate the explicit use of policies weakening capital (besides policies supporting labor). An example of the latter category (i.e., a corporatist welfare regime) is Germany, where individuals are typically attached to groups, and wealth is created through cooperation (see Goodin et al., 1999).

This correlation between values and welfare regimes can be explored using survey data, as in Alesina et al. (2001). Two relevant questions (from the World Values Survey 1985–1997) are:

- (A) “Why, in your opinion, are there people in this country who live in need? Here are two opinions: which comes closest to your view?” The options are “1. They are poor because of laziness and lack of willpower, OR 2. They are poor because society treats them unfairly”. (Define *Unfair*=1 (2) for the first (second) response).
- (B) “Do you think that what the government is doing for people in poverty in this country is about the right amount, too much, or too little?” The options are “1. Too much, 2. About the right amount, OR 3. Too little.” (Define *Too little help*=1, 2 or 3 for the first, second or third responses, respectively).

For the US, 59.8% of people blame laziness (not unfairness) for being in need compared to 22.2% of Europeans while 60.0% of Americans believe that the poor are already receiving either too much help, or the right amount of help, from the government compared to 30.3% of Europeans. The correlations between *Unfair* and our two measures of corporatism, *Corporatism 1–2*, across our sample of countries are 0.80 and 0.97, with significance levels of 11% and 1%, respectively. The correlations with respect to *Too little help* are 0.82 and 0.98, with significance levels of 9% and 1%. Consequently both these sets of results suggest that beliefs shifted toward the (leftist) European position are more closely associated with corporatist structures. This is suggestive evidence in favor of the view that the origin of the difference in adjustment costs comes from differences in values and beliefs.<sup>17</sup>

A second possible origin for such differences in the level of cooperation at the time of setting welfare policy is the form of political representation. Tsebelis (1997) has explicitly argued that the diffusion of authority that characterizes many parliamentary democracies may make changes in policy and general reforms harder to enact. This is particularly true for countries organized through proportional representation electoral systems in Europe, which tend to elect numerous small parties to office. The typical result in such a setting is a coalition government where no one party may entertain a majority of seats, forcing compromise on legislation and power-sharing across cabinet posts (Laver and Schofield, 1990). Define *Majority* to be a dummy variable taking the value of 1 in the presence of either a majority or a plurality rule and 0 otherwise. Across the following sample of European countries, Austria, Belgium, Denmark, Finland, France, Greece, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden and UK, 93% are classified as using proportional representation (i.e., *Majority*=0 in all of them except the UK) compared to the US which uses a majority system.<sup>18</sup> The correlation between *Majority* and our two measures of corporatism, *Corporatism 1–2*, are  $-0.68$  and  $-0.52$ , with significance levels of 1% and 7%, respectively. That is, majority (compared to proportional) electoral systems tend to be associated with less corporatism.

<sup>17</sup> Beliefs concerning the origins of poverty can also be linked to the moral hazard parameter,  $\alpha$ . See the discussion following Proposition 2 above.

<sup>18</sup> Only legislative elections are considered in the construction of our majoritarian electoral rule dummy. The sources are Cox (1997), International Institute for Democracy and Electoral Assistance (1997) and Taagepera and Shugart (1989).

Finally, Katzenstein (1985) has made an interesting connection between the physical size of countries and their social and political organization. He points out that the preeminent political force in small states is the perception of vulnerability (also influenced by their experiences after the Second World War). This generates a demand for a larger welfare state and an ideology conducive to social partnerships, where there is support for continuous compensation policies that help cope with small and open economies (see also Cameron, 1978). In other words, in small open countries there is more demand for ensuring that no group is left behind by the welfare state. This predicts that corporatism should be more frequent amongst smaller countries. The actual correlation coefficients of our two measures, *Corporatism 1–2*, with the size of the labor force are  $-0.67$  and  $-0.60$ , significant at the 2% and 4% levels, respectively (i.e., more corporatism is linked with smaller size).

### 5.3. Empirical impact of adjustment costs

The evidence explained above on values and beliefs across the Atlantic suggests that the US is more individualist with less emphasis on social cohesion so it is also expected to have a lower cost of adjusting welfare institutions. Before discussing this, note that such beliefs are also related to another parameter in our model, namely the incentive effects of unemployment benefits,  $\alpha$ . The evidence concerning beliefs in Europe being inclined more towards the leftist position (blaming poverty on societal unfairness rather than laziness) suggests that  $\alpha$  is perceived to be lower in Europe than the US. The crudest empirical implication of this observation is that, on average, benefits will be set lower in the US (see Proposition 2). We find that, on average, the benefit replacement ratio equals 0.12 (standard error=0.02) in the US compared to 0.27 (s.e.=0.15) in Europe (between 1963 and 1997).

The evidence also suggests that adjustment costs,  $m$ , are higher in Europe and this may have the consequence of generating hysteresis, at least in the simple case where the shock can take on three values (see Proposition 6). An example is the oil price shocks whose economic impact occurred from 1973 to the mid-1980s and their subsequent reversal (the last year of high oil prices was 1985; by 1992 they had returned to 1973 levels). The model predicts that benefits should have been adjusted upward in the US during the oil shock years and subsequently reduced (see Proposition 3 and Fig. 3) but in Europe higher adjustment costs may have prevented them from returning to pre-shock levels.

The table below largely confirms this view. In the US benefits rose by 36% of their pre-shock level during the oil shock impact years and dropped by the same amount following the reversal of the increase in oil prices. On average, benefits in Europe increased by 32% of their pre-shock level during the oil shock years and remained at the same level afterward (in Germany, Austria, Sweden and Norway, there were no changes in benefits between 1985 and 1992 following the shocks and in 6 of the remaining 9 countries the changes were less than or equal to 10% of their 1992 level). Fig. 1A, B illustrate for the cases of Spain and the US.

Benefits before, during and after the oil shocks in the US and Europe

	Oil Shock Period (1973–1985)			Oil Shock Reversal	
	Benefits in 1973	Benefits in 1985	% $\Delta$ in Benefits, from 1973 to 1985	Benefits in 1992	% $\Delta$ in Benefits, from 1985 to 1992
United States	0.11	0.15	36%	0.11	-36%
Europe (average)	0.25	0.33	32%	0.33	0
Austria	0.14	0.29	107%	0.29	0
Belgium	0.47	0.43	-9%	0.41	-5%
Denmark	0.54	0.55	2%	0.63	13%
Finland	0.27	0.36	33%	0.40	10%

(continued)

	Oil Shock Period (1973–1985)			Oil Shock Reversal	
	Benefits in 1973	Benefits in 1985	% $\Delta$ in Benefits, from 1973 to 1985	Benefits in 1992	% $\Delta$ in Benefits, from 1985 to 1992
France	0.31	0.34	10%	0.37	8%
Germany	0.29	0.28	–3%	0.28	0
Ireland	0.20	0.28	40%	0.30	7%
Italy	0.01	0.01	0	0.02	50%
Netherlands	0.34	0.54	59%	0.49	–10%
Norway	0.08	0.39	388%	0.39	0
Spain	0.17	0.34	100%	0.33	–3%
Sweden	0.20	0.31	55%	0.31	0
United Kingdom	0.23	0.21	–95%	0.18	–17%

Note: % change in last column calculated as  $(1992 \text{ Benefits} - 1985 \text{ Benefits}) / 1992 \text{ Benefits}$ .

Data obtained from the [OECD Jobs Study \(1994\)](#).

Our model does not aim to explain the dynamic behavior of benefits in the presence of a long series of small shocks that may lead to less frequent (but larger) changes in countries with high adjustment costs. However, we can give some empirical content to this related issue following the approach used to study unemployment persistence (e.g., [Alogoskoufis and Manning, 1988](#)) and regress the OECD measure of benefits on their lagged values using the specification:  $b_t = \hat{\rho}_c b_{t-1} + \eta_t$  for each country,  $c$ , from 1963–1997. One problem with the OECD overall measure of benefit generosity at higher frequency is that, being a composite of many dimensions (duration and replacement rates for many different family and job situations) that may have different adjustment costs, the changes in this variable may not have a constant meaning for our purposes. Still, the results are interesting at least as a first approximation.

The first column of the table below reports the values of the persistence parameter,  $\hat{\rho}_c$ , for each country. It shows evidence highly suggestive of a pattern of more persistence in unemployment benefits in Europe than in the US (equality of the persistence coefficient across Europe and the US can be rejected at the 5 per cent level). The second and third columns suggest that benefit changes occur less frequently, on average, in Europe than in the US but when they do, are larger in magnitude.

Benefit Time Series Characteristics in the US and Europe, 1963–1997

	Persistence of Benefits, $\hat{\rho}_c$	Proportion of times Benefits changed	Average size of change
United States	0.46 (0.17)	0.82 (0.10)	0.02 (0.01)
Europe (average)	0.84 (0.08)	0.67 (0.03)	0.04 (4e–3)
Austria	0.89 (0.10)	0.94 (0.06)	0.03 (0.01)
Belgium	0.71 (0.32)	0.53 (0.12)	0.04 (0.01)
Denmark	0.88 (0.09)	0.70 (0.11)	0.06 (0.02)
Finland	0.91 (0.10)	0.94 (0.06)	0.04 (0.01)
France	0.78 (0.21)	0.47 (0.12)	0.03 (0.02)
Germany	0.85 (0.19)	0.35 (0.12)	0.01 (8e–4)
Ireland	0.81 (0.11)	0.94 (0.06)	0.02 (4e–3)

(continued on next page)

(continued)

	Persistence of Benefits, $\hat{\rho}_c$	Proportion of times Benefits changed	Average size of change
Italy	0.82 (0.26)	1 (0)	0.01 (1e-3)
Netherlands	0.71 (0.19)	0.41 (0.12)	0.08 (0.03)
Norway	0.97 (0.05)	0.53 (0.12)	0.04 (0.02)
Spain	0.76 (0.07)	0.44 (0.12)	0.06 (0.01)
Sweden	0.87 (0.12)	0.65 (0.12)	0.03 (0.02)
United Kingdom	0.93 (0.09)	0.76 (0.11)	0.02 (2e-3)

Note: Standard errors in parentheses. The column reporting the proportion of times benefits are changed records all the times that benefits are materially different from their previous value.

We can also correlate the country persistence parameters with the variables that we argue are proxying for adjustment costs to show that the differences could be large enough to affect dynamics. For example, if we correlate the  $\hat{\rho}_c$ 's with our two measures of corporatism, both correlations are positive (indicating the more corporatist nations tend to make smaller, less frequent adjustments to benefits). The correlation coefficient of  $\hat{\rho}_c$  with *Corporatism 1* is 0.50 and with *Corporatism 2* is 0.35 across the US and European countries represented in the above tables. The first of these is significant at the 8% level. The differences in *Corporatism 1* and *Corporatism 2* between the US and Europe are able to explain 32% and 25%, respectively, of the difference in persistence between these two regions.

Finally, we note that the correlations between the persistence parameter,  $\hat{\rho}_c$ , and the variables discussed in the previous section (Section 5.2 on the origins of adjustment costs) have the expected signs. The correlation between persistence and *Unfair* is 0.83, significant at the 4% level, while the correlation between persistence and *Too little help* is 0.78, significant at the 7% level. The correlation between persistence and *Majority* is  $-0.44$ , significant at the 7% level. Finally, the correlation between persistence and size of the labor force is  $-0.68$ , significant at the 1% level.

## 6. Conclusions

When economists study labor market outcomes, the dynamics of institutions present in their models are typically left unexplained. Consider, for example, the time path of unemployment benefits. Figs. 1A and 1B show how they increased sharply in the United States and Spain in the years immediately after 1973 and 1979. A similar pattern is present in the data for many other OECD countries. If we are worried about the unemployment rate and believe institutions are exogenous, we must also believe that these countries were incredibly unlucky. Just when they got hit by an oil shock, politicians decided to increase benefits, worsening their unemployment problems. Only the US turned out to be lucky in the 1980's when benefits returned to their pre-shock levels. A less ad-hoc story involves developing a theory where institutions are rational. In such a theory, unemployment benefits can certainly increase the unemployment rate, but it should also allow us to understand what drives movements in benefits. This is the objective of our paper.

We present a model where the government sets unemployment benefits to maximize social welfare in response to an unemployment shock, subject to a budget constraint and

the possibility that unemployment benefits may introduce incentive problems that increase the unemployment rate. The following results can be established:

1. In the absence of incentive effects (whereby higher benefits increase the unemployment rate) there should be full insurance. Unemployment benefits, on the other hand, should be set lowest (highest) when the adverse incentive effects of benefits are largest (smallest).
2. In response to a shock that increases unemployment, benefits should be increased in those economies where the adverse incentive effects are most severe. The intuition for this result stems from the fact that benefits are set optimally at all times, including the moment just before the shock occurs. Thus, large incentive effects imply a low initial level of benefits and large welfare gains derived from better insurance when there is an unemployment shock. As a reference concerning the size of such incentive effects, note that survey evidence reveals that the majority of Americans believe that the poor are lazy as opposed to unlucky, whereas the opposite is true in Europe.
3. In the presence of an adjustment cost of changing the level of benefits there may exist hysteresis in benefit setting (and unemployment). In other words, the level of benefits (and unemployment) may rise in the presence of an adverse shock and remain higher than the initial value once the shock has disappeared.
4. The reason for the asymmetry is that a shock increases the degree of *concavity* of the objective function (social welfare). This occurs because the shock incorporates into the objective function a group of people who are on a more concave part of their utility function. It suggests that the key assumption driving hysteresis is that the utility function has a positive third derivative (people do not become more risk averse as they become richer). Contrary to previous models, we do not require any behavioral asymmetries between ‘insiders’ and ‘outsiders’ or between the short-term and long-term unemployed. And when unemployment tends to one, tax considerations prevail so the mechanism is self-correcting.
5. We conjecture that adjustment costs are higher in political systems where decision making involves more agents and provide evidence that this is the case in Europe compared to the US. Moreover the more individualist values and beliefs in the US suggest that there is less emphasis on social cohesion and also that the incentive costs of benefits are perceived to be higher. The empirical implications of our model are that benefits should be set lower in the US compared to Europe; benefits should have been adjusted upward in the US during the oil shock years and subsequently reduced whereas in Europe higher adjustment costs may have prevented them from returning to pre-shock levels. The observed levels and changes in benefits are broadly supportive of these predictions.

## Appendix A

[Fig. 1](#)

[Fig. 2](#)

[Fig. 3](#)

[Fig. 4](#)

[Fig. 5](#)

**Appendix B**

**Proof of Proposition 1.**

- a. Consider the outcome when  $\varepsilon$  changes from 0 to  $\varepsilon 1$  to 0 (i.e., the shock is of size  $\varepsilon 1$ ). Assume as an initial condition that  $b = b^0$ . Define  $f(x) = S(b^0 + x, 0)$  and  $g(x) = S(b^{\varepsilon 1} - x, \varepsilon 1)$  where  $g''(x) < f''(x) < 0 \forall x \in (0, b^{\varepsilon 1} - b^0)$  by assumption. Integrating both sides gives  $\int_0^z g''(x) dx < \int_0^z f''(x) dx \forall z \in (0, b^{\varepsilon 1} - b^0)$ . Hence  $g'(z) - g'(0) < f'(z) - f'(0) \Rightarrow g'(z) < f'(z)$  since  $g'(0) = f'(0) = 0$ . Integrating both sides again gives  $\int_0^{b^{\varepsilon 1} - b^0} g'(z) dz < \int_0^{b^{\varepsilon 1} - b^0} f'(z) dz$ . Hence  $g(b^{\varepsilon 1} - b^0) - g(0) < f(b^{\varepsilon 1} - b^0) - f(0) \Rightarrow S(b^0, \varepsilon 1) - S(b^{\varepsilon 1}, \varepsilon 1) < S(b^{\varepsilon 1}, 0) - S(b^0, 0)$ . In other words,  $-\Delta S^{\varepsilon 1} < -\Delta S^0 \Rightarrow \Delta S^{\varepsilon 1} > \Delta S^0$ . Provided  $\Delta S^0 < m < \Delta S^{\varepsilon 1}$  then in the presence of the shock,  $b$  changes from  $b^0$  to  $b^{\varepsilon 1}$  (the gain is  $\Delta S^{\varepsilon 1} - m > 0$ ) but not back again once the shock has gone (the loss would be  $\Delta S^0 - m < 0$ ). Consequently there exists hysteresis.
- b. Consider the outcome when  $\varepsilon$  changes from  $\varepsilon 1$  to 0 to  $\varepsilon 1$  (i.e., the shock is of size  $-\varepsilon 1$ ). Assume as an initial condition that  $b = b^{\varepsilon 1}$ . Again define  $f(x) = S(b^0 + x, 0)$  and  $g(x) = S(b^{\varepsilon 1} - x, \varepsilon 1)$ . Since in this case  $f''(x) < g''(x) < 0 \forall x \in (0, b^{\varepsilon 1} - b^0)$  by assumption, then  $\Delta S^{\varepsilon 1} < \Delta S^0$  using a similar logic as in part (a). Provided  $\Delta S^{\varepsilon 1} < m < \Delta S^0$  then in the presence of the shock,  $b$  changes from  $b^{\varepsilon 1}$  to  $b^0$  (the gain is  $\Delta S^0 - m > 0$ ) but not back again once the shock has gone (the loss would be  $\Delta S^{\varepsilon 1} - m < 0$ ).
- c. Define  $f(x) = S(b^0 + x, 0)$  and  $g(x) = S(b^{\varepsilon 1} - x, \varepsilon 1)$ . Since in this case  $f''(x) = g''(x) \forall x \in (0, b^{\varepsilon 1} - b^0)$  by assumption, then  $\Delta S^{\varepsilon 1} = \Delta S^0$  using a similar logic as in part (a). Provided  $m < \Delta S^0 = \Delta S^{\varepsilon 1}$  then in the presence of the shock,  $b$  changes from  $b^0$  to  $b^{\varepsilon 1}$  (the gain is  $\Delta S^0 - m > 0$ ) and hence it must also pay to change back again once the shock has gone (the gain is  $\Delta S^{\varepsilon 1} - m > 0$ ). If  $m > \Delta S^0 = \Delta S^{\varepsilon 1}$  then it does not pay to change  $b$  at all. Consequently there cannot exist hysteresis.  $\square$

**Proof of Proposition 3.** Substituting in  $SW(b, u, T, \varepsilon)$ , for constraints (8) and (9) yields  $S(b, \varepsilon)$ . The effect of a shock on the marginal gain from increasing benefits is:

$$\frac{\partial^2 S}{\partial \varepsilon \partial b} = [U'(bw) - U'(w^n)]w - U'(w^n)r \left( u + \frac{\alpha b}{1-u} \right) \frac{bw^2}{(1-u)^2} \tag{A1}$$

where  $r = -U''(w^n)/U'(w^n)$  is the coefficient of absolute risk aversion

- a. As  $\alpha \rightarrow 0$ , the FOC (10) implies that  $U'(w^n) \rightarrow U'(bw)$  and from Eq. (A1):

$$\frac{\partial^2 S}{\partial \varepsilon \partial b} \rightarrow -U'(w^n)r \left( u + \frac{\alpha b}{1-u} \right) \frac{bw^2}{(1-u)^2} \tag{A2}$$

which is negative. Hence using the implicit function theorem, benefits should be cut following the occurrence of an adverse shock when incentive effects are small.

- b. If incentive effects are large so  $b$  is small then:

$$\frac{\partial^2 S}{\partial \varepsilon \partial b} \rightarrow [U'(bw) - U'(w^n)]w \tag{A3}$$

which is positive provided that the utility function is strictly concave and the coefficient of absolute risk aversion,  $r$ , has an upper bound. Hence using the implicit function theorem, benefits should be increased following the occurrence of an adverse shock when incentive effects are large.  $\square$

**Proof of Proposition 4.** The second derivative of the social welfare function is:

$$\frac{\partial^2 S}{\partial b^2} = uw^2 U''(bw) + 2\alpha \left[ wU'(bw) - \frac{\partial w^n}{\partial b} U'(w^n) \right] + (1-u) \left[ \left( \frac{\partial w^n}{\partial b} \right)^2 U''(w^n) + \frac{\partial^2 w^n}{\partial b^2} U'(w^n) \right] \tag{A4}$$

The effect of a shock on the concavity of the welfare function for a given value of  $b$  is:

$$\frac{\partial}{\partial \varepsilon} \left( \frac{\partial^2 S}{\partial b^2} \right) = [U''(bw) + \Phi U''(w^n)] w^2 - \psi U'''(w^n) \frac{(u + \frac{ub}{1-u})^2 w^3}{(1-u)} \tag{A5}$$

where  $\Phi = \alpha b [4 + 3\alpha b / (1-u)] / (1-u)^3 + u(2-u) / (1-u)^2$  and  $\psi = b / (1-u)^2$ . Since both  $\Phi$  and  $\psi$  are positive,  $U''(bw) < 0$  and  $U''(w^n) < 0$ , a sufficient condition for Eq. (A5) to be negative is that  $U'''(w^n) \geq 0$ . Hence  $\partial^2 S / \partial b^2$  is a monotonically decreasing function of  $\varepsilon$ , implying that  $\partial^2 S(b, \varepsilon 1) / \partial b^2 < \partial^2 S(b, 0) / \partial b^2 \forall b, \forall \varepsilon 1 > 0$ . □

**Proof of Proposition 6.** It is simple, but not necessary, to let  $\theta \rightarrow \infty$  so that only current period welfare is valued. For there to be hysteresis for the sequence of shocks  $(0, \varepsilon 1, 0)$  or  $(\varepsilon 1, \varepsilon 2, \varepsilon 1)$  but not  $(0, \varepsilon 2, 0)$  then the following inequalities must hold:

i)  $A - m > 0$ , ii)  $B - m < 0$ , iii)  $C - m > 0$ , iv)  $D - m < 0$ , v)  $E - m > 0$ , vi)  $F - m > 0$ , where:

$A = S(b^{\varepsilon 1}, \varepsilon 1) - S(b^0, \varepsilon 1) = \Delta S^{\varepsilon 1}$	(change from $b^0 \rightarrow b^{\varepsilon 1}$ for shock, $\varepsilon 1$ )
$B = S(b^0, 0) - S(b^{\varepsilon 1}, 0) = \Delta S^0$	(change from $b^{\varepsilon 1} \rightarrow b^0$ for shock, 0)
$C = S(b^{\varepsilon 2}, \varepsilon 2) - S(b^{\varepsilon 1}, \varepsilon 2)$	(change from $b^{\varepsilon 1} \rightarrow b^{\varepsilon 2}$ for shock, $\varepsilon 2$ )
$D = S(b^{\varepsilon 1}, \varepsilon 1) - S(b^{\varepsilon 2}, \varepsilon 1)$	(change from $b^{\varepsilon 2} \rightarrow b^{\varepsilon 1}$ for shock, $\varepsilon 1$ )
$E = S(b^{\varepsilon 2}, \varepsilon 2) - S(b^0, \varepsilon 2)$	(change from $b^0 \rightarrow b^{\varepsilon 2}$ for shock, $\varepsilon 2$ )
$F = S(b^0, 0) - S(b^{\varepsilon 2}, 0)$	(change from $b^{\varepsilon 2} \rightarrow b^0$ for shock, 0)

It holds by assumption that  $\partial^2 S / \partial b^2 < 0$ . Also  $b^0 < b^{\varepsilon 1} < b^{\varepsilon 2}$  and from Proposition 4,  $\partial^2 S(b, \varepsilon 2) / \partial b^2 < \partial^2 S(b, \varepsilon 1) / \partial b^2 < \partial^2 S(b, 0) / \partial b^2$  for  $0 < \varepsilon 1 < \varepsilon 2$ . Hence  $B < A, D < C, F < E, 0 < B < F$  and  $0 < C < E$ . Then provided  $0 < B \leq D < m < A \leq F \leq C < E$ , all the above conditions are satisfied and hysteresis exists. □

*Quantification*

In Spain between 1975 and 1983 unemployment rose from 5% to 18%. Over the same time period the benefit replacement rate rose from 0.21 to 0.36. Average earnings in 1975 were \$US 9433 (at 1990 exchange rates and prices, obtained from OECD Historical Statistics). An estimate of the incentive effects of benefits,  $\alpha$ , is 0.15 (see Krueger and Meyer, 2002).

To parameterize our model, let  $w = 9433$ , pre-shock unemployment =  $0.03 + 0.15b$  and adverse-shock unemployment =  $0.3 + 0.08 + 0.15b$  (i.e., the shock to unemployment is equal to 8%). Then the pre-shock optimal level of benefits is  $b^0 = 0.16$  and the adverse shock optimal level is  $b^{\varepsilon 1} = 0.40$  (both of these are solutions obtained from the model). At these levels of benefits the initial level of unemployment is 5% and the adverse shock level increases to 18%, which both match the actual experience of Spain (see above).

Fig. 6 is a simulation using the above parameterization to show how social welfare (as a function of benefits) shifts in the presence of the shock.

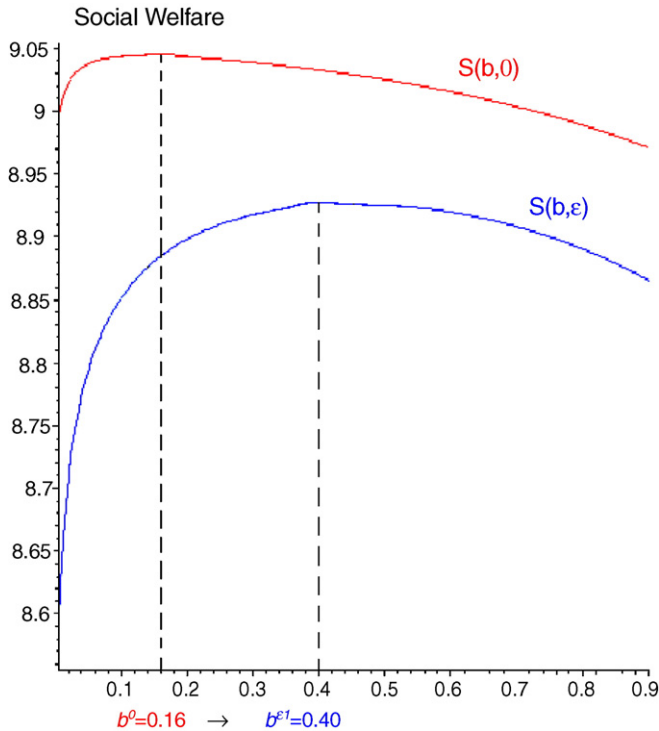


Fig. 6. Social Welfare vs. Benefits before and during an Adverse Shock.

## References

- Acemoglu, Daron., Robinson, James A., 2006. Persistence of Power, Elites, and Institutions. National Bureau of Economic Research Working Paper, vol. 12108.
- Alesina, Alberto, Angeletos, George-Marios, 2002. Fairness and Redistribution: US versus Europe. National Bureau of Economic Research Working Paper, vol. 9502.
- Alesina, Alberto, Drazen, Allan, 1991. Why are stabilizations delayed? *American Economic Review* 81 (5), 1170–1188.
- Alesina, Alberto, Glaeser, Edward, Sacerdote, Bruce, 2001. Why doesn't the United States have a European style welfare state? *Brookings Papers on Economic Activity* 2, 187–278 (Fall).
- Alogoskoufis, George, Manning, Alan, 1988. Unemployment persistence. *Economic Policy* 429–469.
- Atkinson, Antony, 1990. Income maintenance for the unemployed in Britain and the response to high unemployment. *Ethics* 100, 569–585.
- Benabou, Roland, Ok, Efe, 2001. Social mobility and the demand for redistribution: the POUM hypothesis. *Quarterly Journal of Economics* 116 (2), 447–487.
- Benabou Benabou, Roland, Jean Tirole 2002. "Belief in a Just World and Redistributive Politics", mimeo Princeton University.
- Blanchard, Olivier, Katz, Larry, 1997. What we know and don't know about the natural rate of unemployment. *Journal of Economic Perspectives* 11 (1), 51–72.
- Blanchard, Olivier, Summers, Lawrence, 1986. Hysteresis and the European Unemployment Problem. In: Fischer, S. (Ed.), *NBER Macroeconomics Annual*, vol 1. MIT Press, Cambridge, pp. 15–78.
- Blanchard, Olivier, Wolfers, Justin, 2000. The role of shocks and institutions in the rise of European unemployment. *Economic Journal* 110 (462), C1–C34.
- Cameron, David, 1978. The expansion of the public economy: a comparative analysis. *American Political Science Review* 72, 1243–1261.



- Chiu, Henry, Karni, Edi, 1998. Endogenous adverse selection and unemployment insurance. *Journal of Political Economy* 106 (4), 806–827.
- Cox, Gary, 1997. *Making Votes Count*. Cambridge University Press, Cambridge, UK.
- Di Tella, Rafael, MacCulloch, Robert, 2002. The determination of unemployment benefits. *Journal of Labor Economics* 20, 2, 404–434.
- Dixit, Avinash, Pindyck, Robert, 1994. *Investment Under Uncertainty*. Princeton University Press, Princeton.
- Esping-Anderson, Gosta, 1990. *The Three Worlds of Welfare Capitalism*. Princeton University Press, New Jersey.
- Feldstein, Martin, 1978. The effect of unemployment insurance on temporary layoff-unemployment. *American Economic Review* 68 (5), 834–846.
- Fernandez, Raquel, Rodrik, Dani, 1991. Resistance to reform: status quo bias in the presence of individual specific uncertainty. *American Economic Review* 81, 1146–1155.
- Goodin, Robert, Headey, Bruce, Muffels, Ruud, Dirven, Henk, 1999. *The Real Worlds of Welfare Capitalism*. Cambridge University Press.
- Grubb, David, 2005. Trends in Unemployment Insurance, Related Benefits and Active Labor market Policies in Europe, Paper prepared for the International Seminar on Employment/Unemployment Insurance celebrating the 10th anniversary of Employment Insurance in South Korea (7th and 8th July 2005).
- Hall, Robert, 1986. Comment. In: Fischer, S. (Ed.), *NBER Macroeconomics Annual*, vol. 1. MIT Press, Cambridge, pp. 15–78.
- Hall, Peter, David Soskice 2001. *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, editors, Oxford University Press.
- Hamermesh, Daniel, 1995. Policy Transferability and Hysteresis: Daily and Weekly Hours in the BRD and the US. In: Buttler, F., et al. (Ed.), *Institutional Frameworks and Labor Market Performance: Comparative Views on the US and German Economies*. Routledge.
- Hansen, Gary, Imrohoroglu, Ayse, 1992. The role of unemployment insurance in an economy with liquidity constraints and moral hazard. *Journal of Political Economy* 100 (1), 118–142.
- Hassler, John, Rodríguez Mora, José V., Storesletten, Kjetil, Zilibotti, Fabrizio, 1999. *Equilibrium Unemployment Insurance*. IIES Working paper, vol. 665.
- Hassler, Jonh, Rodríguez Mora, José V., Storesletten, Kjetil, Zilibotti, Fabrizio, 2003. The survival of the welfare state. *American Economic Review* 93 (1), 87–112.
- Hicks, Alexander, 1988. National collective action and economic performance: a review article. *International Studies Quarterly* 32, 2, 131–153.
- Hicks, Alexander, Kenworthy, Lane, 1998. Cooperation and political economic performance in affluent democratic capitalism. *The American Journal of Sociology* 103 (6), 1631–1672.
- International Institute for Democracy and Electoral Assistance, 1997. *Electoral System Design*. Stockholm.
- Iversen, Tortben, Soskice, David, 2001. An asset theory of social policy preferences. *American Political Science Review* 95, 875–893.
- Katzenstein, Peter, 1985. *Small States in World Markets: Industrial Policy in Europe*. Cornell University Press, Ithaca.
- Kimball, Miles, 1994. Labor-market dynamics when unemployment is a worker discipline device. *American Economic Review* 84, 4, 1045–1059.
- Krueger, Alan, Meyer, Bruce, 2002. Labor Supply Effects of Social Insurance. In: Auerbach, A., Feldstein, M. (Eds.), *Handbook of Public Economics*, Chapter 33. Elsevier Science B.V., pp. 2327–2392.
- Laver, Michael, Schofield, Norman, 1990. *Multiparty Government: The Politics of Coalition in Europe*. Oxford University Press, Oxford.
- Lemieux, Thomas, McLeod, Bentley, 1998. Supply Side Hysteresis: The Case of the Canadian Unemployment Insurance System. NBER, p. 6732.
- Lijphart, Arend, Crepaz, Markus, 1991. Corporatism and consensus democracy in eighteen countries: conceptual and empirical linkages. *British Journal of Political Science* 21 (2), 235–246.
- Lindbeck, Assar, Snower, Dennis, 1988. Cooperation, harassment, and involuntary unemployment: an insider–outsider approach. *American Economic Review* 78 (1), 167–188.
- Luttmer, Erzo, 2001. Group loyalty and the taste for redistribution. *Journal of Political Economy* 109, 500–528.
- Marks, Gary, 1986. Neocorporatism and incomes policy in Western Europe and North America. *Comparative Politics* 18, 253–277 (April).
- Moene, Karl Ove, Wallerstein, Michael, 2001. Inequality, social insurance, and redistribution. *American Political Science Review* 95 (4), 859–874.
- Mortensen, Dale, 1977. Unemployment insurance and job search decisions. *Industrial and Labor Relations Review* 30 (4), 505–517.

- North, Douglass, 1990. A transaction cost theory of politics. *Journal of Theoretical Politics* 2, 4, 355–367.
- OECD, 1994. *The OECD Jobs Study*. Clarendon Press, Oxford.
- Pierson, Paul, 1994. Dismantling the Welfare State? Reagan, Thatcher and the Politics of Retrenchment. Cambridge University Press, Cambridge.
- Piketty, Thomas, 1995. Social mobility and redistributive politics. *Quarterly Journal of Economics* 110 (3), 551–584.
- Roland, Gerald, 2004. Understanding institutional change: fast-moving and slow-moving institutions. *Studies in Comparative International Development* 28 (4), 109–131.
- Saint-Paul, Gilles, 1996. Exploring the political economy of labour market institutions. *Economic Policy* 23, 265–315 (October).
- Schmitter, Philippe, Lehbruch, Gerald, 1979. *Trends Toward Corporatist Intermediation*. Sage Publications, London.
- Shapiro, Carl, Stiglitz, Joseph, 1984. Equilibrium unemployment as a worker discipline device. *American Economic Review* 74 (3), 433–444.
- Shavell, Steven, Weiss, Laurence, 1979. The optimal payment of unemployment benefits over time. *Journal of Political Economy* 87 (6), 1347–1362.
- Taagepera, Rein, Shugart, Matthew, 1989. *Seats and Votes: The Electoral Systems*. Yale University Press, New Haven, CT.
- Titmuss, Richard, 1958. *Essays on the Welfare State*. Allen and Unwin, London.
- Tsebelis, George, 1997. Maastricht and the ‘Democratic Deficit’, *Aussenwirtschaft*, 52, 29–56. Reprinted in P. Moser, G. Schneider, and G. Kirchgaessner, (Eds.) *Decision Rules in the European Union: A Rational Choice Perspective*, London: Macmillan.
- Wright, Randall, 1986. The redistributive roles of unemployment insurance and the dynamics of voting. *Journal of Public Economics* 31, 377–399.