Monitoring Unemployment Benefits in Comparative Perspective

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Most economic theories predict a rise in unemployment when unemployment benefits increase. The reason is that more people will be willing to exit from work, and fewer people will enter the workforce, when benefits are high. We argue that these theories oversimplify the situation because they do not take into account the way benefits are monitored. We present a model of monitoring benefits which leads to three conclusions that are different from standard economic theory: (1) Size of unemployment benefit has no effect on unemployment; (2) Duration of unemployment benefit has a positive effect on unemployment; (3) Size of unemployment benefit has a positive effect on the monitoring of benefits. We present historical evidence in favor of these propositions from a series of countries, and test them cross-nationally with Organization for Economic Cooperation and Development (OECD) data.

The rise in unemployment during the 1970s and 1980s has focused the attention of academics and policymakers on the level of unemployment benefits. There are two reasons for such a focus. The first is that unemployment has an effect on public expenditures and government budgets. The second is that according to most economic models the level of unemployment benefits causes unemployment (Johnson and Layard 1986). The argument is that high benefits make the unemployed less willing to accept a job, and the employed more willing to quit their job.

It is widely acknowledged, of course, that unemployment is a complicated issue, and that there are different reasons, multiple causes, and different possible remedies for unemployment. However, if causal arrows go from the level of benefits to the level of unemployment, one simple explanation for the rise of unemployment in Western Europe since the 1970s is the high level of these

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benefits. What is more, if benefits cause unemployment, there are also some simple methods of reducing it: cuts in the level of benefits. Some policymakers have endorsed this reasoning. For example, the British Conservative Government made serious reductions in unemployment benefits in the early 1980s because it believed that the generosity of these benefits constituted a major disincentive to work (Department of Employment 1985).

The empirical evidence connecting level of benefits with unemployment is quite weak (Atkinson et al. 1984; Narendranathan et al. 1985). For example countries like Germany and Sweden, with relatively high benefits (that is, a high replacement rate of average production worker earnings), have enjoyed unemployment rates significantly below the Organization for Economic Cooperation and Development (OECD) average (OECD 1991b). The most recent OECD study (1991a: 208) argues that "although different indicators could be used, it seems unlikely that this would result in any strong general cross-country correlation between benefit levels and unemployment rates emerging."

On the other hand, there is evidence of the dependence of unemployment on the duration of benefits. For example, Katz and Meyer (1990) find that in the U.S. entry into new jobs becomes more likely in the week before benefits terminate. In Japan, where benefit duration varies with age, Mizuno (1989) finds that exiting unemployment for each age group peaks around the period of benefit termination. The OECD (1991b: 207) study noted above claims that "labor market policies, or limited benefit duration or some combination of the two, are often an important factor in countries that have low levels of long-term unemployment."

The purpose of this article is to provide an explanation of why unemployment depends on the duration but not on the size of benefits. Moreover, we point out some of the simplifications in the theoretical economic literature that lead to the expectation that the size of benefits affects unemployment. Finally, we show that the size of benefits affects the level of monitoring of these benefits.

In a nutshell, the argument of this study is that most of the theoretical economic literature has ignored the institutional structure governing the administration of unemployment benefits. We present a model introducing such a structure. In particular the model considers unemployment not as the aggregate outcome of the individual decisions of people entering and exiting two pools of employment and unemployment, but as a game between these people and employment agencies. In other words, in this article unemployment is not considered as the isolated decision of a rational player, but as a game between two rational players. Consequently, how benefits are administered is as important as (or maybe more important than) the level of benefits.

The article is organized in three sections. Section 1 presents a review of the theoretical and empirical literature on unemployment benefits and their effects. With rare exceptions, institutional structures and monitoring have been
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ignored by the literature Section 2 presents a simplified monitoring game between the unemployed and the employment agency. The agency helps the unemployed find a new job, but it may refuse benefits if reasonable work opportunities are rejected by the unemployed. This model yields the expectation that size of benefits has no effect on aggregate rates of unemployment, while the duration of benefits does have such an effect; moreover, the size of the benefits affects the intensity of monitoring. Section 3 presents historical empirical evidence in favor of the model from different European countries and tests its predictions cross-nationally with OECD data.

1. UNEMPLOYMENT BENEFITS AND UNEMPLOYMENT

In a review of different explanations for the natural level of unemployment in the Handbook of Labor Economics, Johnson and Layard (1986: 923) observe that "there has been an astonishing growth" of unemployment in Europe over the last fifteen years. They then present a series of models of the natural rate of unemployment. In all these models "unemployment insurance will increase unemployment" (ibid.: 923). They argue that these models "may also help to explain why unemployment has risen in countries where the replacement rate [the ratio of unemployment benefits to net income in work] has risen, or benefits become less painful to acquire" (ibid.: 924).

Similarly, Lippman and McCall (1979) and Hey (1979: ch. 14) consider job search models, and demonstrate that an increase in unemployment benefits increases the probability that an unemployed person will remain unemployed. The argument is simple: The optimal search strategy for each unemployed person is to set a reservation wage \( w^* \), and follows a rule according to which he/she continues the search if an offer is lower than \( w^* \), and accepts any offer greater than \( w^* \). In a search model, the greater the \( w^* \) and the lower the search costs, the longer the time spent searching (and in the aggregate, the higher the unemployment level). Lippman and McCall (1979: 5) argue that "one of the predictions of the standard model is that the presence of unemployment insurance should increase . . . the duration of search . . . [because] of the negative relationship between the cost of search and its expected duration." Finally, Atkinson et al. (1984: 3) start their paper with the following quotation from the economics literature which, they argue, aptly summarizes the prevailing economic wisdom: "the theory of job search suggests that subsidized benefits of a general unemployment insurance system . . . create substitution effects in favor of greater frequency and longer duration periods of unemployment."

Atkinson and Micklewright (1991) review the unemployment benefits literature and report extensively on its assumptions and findings. This section is based to a large extent on their reports. They argue that there is a series of underlying assumptions in the standard economic literature:
Unemployment benefit . . . is of the following "hypothetical form;"
(a) the benefit is paid irrespective of the reasons for entry into unemployment,
(b) it is paid for all days of unemployment, from the onset of a spell,
(c) it is independent of the person's efforts to search for new employment, or of his or her availability for work,
(d) there is no penalty to the refusal of job offers,
(e) there are no contribution conditions related to past employment record,
(f) the benefit is paid at a flat rate,
(g) benefit is paid for an unlimited duration,
(h) eligibility for benefit is not affected by the level of income of other household members. (Atkinson and Micklewright 1991: 1688)

However, in OECD countries unemployment benefits are refused when a person enters unemployment voluntarily, or as a result of misconduct; they are in some cases not paid for an initial period; they are conditional upon genuine efforts to search for a new job; and they are withheld if the unemployed refuses to accept some specified number of "suitable" job offers. Consequently assumptions (a) to (d) are never met.

Moreover, OECD studies distinguish between unemployment insurance and unemployment assistance. Unemployment insurance is conditional, either on past contributions or past record of insured employment; the benefits depend on past earnings; and the benefits are of limited duration and/or may decline over time. Consequently, unemployment insurance violates assumptions (e) (f) and (g), in addition to assumptions (a)-(d). Unemployment assistance, on the other hand, does not depend on previous contributions, and is often of unlimited duration, but it may be means tested not only with respect to the individual, but also with respect to other members of the household. Consequently unemployment assistance, in addition to (a)-(d), often violates assumptions (f) and (h).\(^1\) However, the OECD (1988: 116) notes that even a simple classification of benefit schemes into insurance or assistance "types" is schematic and "useful only to a limited extent." A detailed examination of each country's scheme will indicate that classifying them into one category or another is rarely justified. The situation becomes more complicated by the fact that unemployment schemes differ "not only from one country to another, but also within each country" (OECD 1988: 199).

This account suggests that OECD countries do not provide unemployment benefits unconditionally. Instead, they impose a series of restrictions, condi-

\(^1\) The tests of conditions (a) to (d) for unemployment assistance may not be as stringent as for unemployment insurance; however, countries may link these benefits to "re-integration in society" (like the "revenu minimum d'insertion" in France).
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tions, and tests. Moreover, they have a sizable mechanism to administer these tests. This monitoring mechanism takes the form of employment agencies. Their task is to screen unemployment claimants in order to see whether they meet the appropriate conditions, assist them in finding new employment and reintegrate them into society. Very often there is either a separate branch of the employment agency or an entirely separate institution to provide training and job-search skills to the unemployed, in order to accelerate their reintegration into the work force. Sometimes the payment of benefits is conditional upon the recipients accepting positions in educational or other training programs (this is characterized as a form of "workfare"). This is true of countries as diverse as Britain, Sweden, the U.S.A. and Germany (see below for a discussion of all except the U.S. case).

However, all these structures may not adequately or effectively perform their declared functions, and it may well be that upon close examination the unemployment system of a country is adequately summarized by the size of the benefit. Even better, the conditions imposed on the recipients of unemployment benefits may be effective deterrents which prevent the undeserving unemployed from applying for them. If one of these assumptions were true all applicants would receive unemployment benefits, either because the monitoring mechanisms do not screen people, or because all frivolous applications are deterred.

A closer look at OECD countries indicates that this is not the case. The conditions of unemployment benefits are applied and people are indeed screened out by employment offices. For example, a recent paper by Micklewright (1990) is entitled: "Why Do Less than a Quarter of the Unemployed in Britain Receive Unemployment Insurance?" Blank and Card (1989) estimated that less than a third of the unemployed in the U.S. received unemployment insurance. The major reasons for disqualification, according to the U.S. Department of Health and Human Services (1989: 21), are voluntary separation, discharge for misconduct, refusal to apply for or accept suitable work, or involvement in a labor dispute. In West Germany the percentage of unemployed who receive unemployment insurance is higher than in the U.S. and U.K., but not by much: Brunhes and Annandale-Massa (1986) report that only 40 percent of those eligible received it in December of 1988. Finally in Sweden, while the percentage of the unemployed receiving some kind of benefit is substantial, 30-40 percent do not receive the benefit in the form of unemployment insurance payments (Bjorklund and Holmlund 1989: 169).

Further research indicates that the unemployed are dropped not only from the more restrictive unemployment insurance schemes, but also from the more

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universal unemployment assistance programs. The number of unemployment claimants not receiving any form of assistance in the 1980s was around 20 percent in the United Kingdom, and 30 percent in Germany (Atkinson and Micklewright 1991: 1693).

This brief and necessarily eclectic description indicates that the standard account of unemployment benefit as "the wage when not working" is an oversimplification of the situation, and that the institutional features of administering unemployment benefits, as well as the monitoring of the unemployment benefit claimants, have to be taken into consideration.

Now let us turn to the empirical side of the problem. Is it true that the level of unemployment benefits causes unemployment? In the beginning of the 1980s it seemed that the positive effect of benefits on unemployment was being confirmed in the empirical literature on the U.K. and the U.S. Danziger et al. (1981: 992), reviewing the empirical economic literature for the U.S., came to the conclusion that "despite the problems, a positive relation between unemployment insurance and duration of unemployment appears robust" Lancaster and Nickell (1980) came to similar conclusions from their separate work on the U.K. However, five years later the conclusions of literature reviews were quite different: Narendranathan et al. (1985: 307) report that "the diversity [of findings] has increased to the extent that estimates [of the elasticity of unemployment with respect to benefits] may now be found anywhere from negative to four."

In all these studies the size of the impact of benefits is quite small. For example, Lancaster and Nickell (1980) find that a 10 percent rise in benefits would increase the duration of unemployment by one week for a 17-week spell of unemployment. The American literature comes to similar conclusions. More recent work in the U.S. and the U.K. finds even smaller effects. For example Narendranathan et al. (1985) find a .3 elasticity of duration of unemployment (a 10 percent increase in benefit adds one week to a 33-week period of unemployment). Moffitt (1985) reports a .4 elasticity of duration of unemployment (a 10 percent increase in benefit extends a stretch of unemployment from 25 weeks to 26).

All these studies assume a constant probability for the transition from unemployment across different groups and across time. When econometric models allow for variable coefficients, it turns out that in the U.K. the benefit effect exists for teenagers but practically disappears after the age of 25 (Narendranathan et al. 1985). In different countries the effects vary across time. For example, the effects of benefits on the probability of exiting unemployment is positive and then zero in the U.K. (Nickell 1979a and b); while in Holland the effect increases after two years (van den Berg 1990).

More to the point, Atkinson et al. (1984) and Atkinson and Micklewright (1985) reanalyzed the U.K. data and found that, when actual instead of nominal
benefits are used as the independent variable (including changes of benefits over the period of unemployment), "the effect ceased to be significantly different from zero" (Atkinson and Micklewright 1991: 1711).

In other OECD countries Atkinson and Micklewright (1991: 1712) report that the effects of benefits on unemployment duration are also small or imprecise. Florens et al. (1990a: 342) find "ambiguous" effects from French data. Wurzel (1988) finds a negative but non-significant effect for West Germany, while Hujer and Schneider (1989) find that a switch from unemployment insurance to unemployment assistance (which implies a significant reduction in benefits) results in a significant fall in exit probability (the opposite of the expected effect). Ham and Rea (1987) find no significant effect with Canadian data, while Trivedi and Kapuscinski (1985) find robust but small effects.

The effects of unemployment benefits become even more ambiguous if one separates transitions from unemployment into different kinds of employment or exit from the labor market. For example, Clark and Summers (1982) find insignificant effects of benefits on transition to both employment and inactivity, while Barron and Mellow (1981) find that both effects are negative. In France, studies distinguishing among precarious and regular employment find a highly negative and significant effect of benefit size on transition to precarious jobs, and a less significant effect on regular jobs (Atkinson and Micklewright 1991: 1714).

In contrast to the size of unemployment benefits, the duration of unemployment benefits seems to have clearer results. In country after country the typical result is that there is an increase in exit from unemployment right around the period of exhaustion of benefits. Here is OECD's (1991: 207) account of the phenomenon: "In statistics for unemployed people with benefit entitlements of a specific duration, monthly rates of exit from unemployment seem typically to decline in the first month or several months of unemployment, rise before benefit exhaustion, and reach peak levels in the month or several months after exhaustion, before falling back again." OECD's evidence comes from France (Florens et al. 1990b), from Canada (Ham and Rea 1987), from Spain (Albar-Ramirez and Freeman 1990), and from Japan (Mizuno 1989). Similar effects for the U.S. can be found in Moffitt and Nicholson (1982) and Moffitt (1985). Some studies find opposite patterns (increased probability of exiting unemployment as a function of time) for particular, country-specific reasons. For example, Bjorklund (1990) finds such a relationship in Sweden and hypothesizes that it is caused by particular attention paid by unemployment offices to the placement of long-term unemployed. Andersen (1989) explains a similar pattern in Holland by the existence of government-sponsored temporary work programs offered to people whose entitlement was near its end.

Katz and Meyer (1990), analyzing U.S. data, find that a change in unemploy-
ment benefit duration has more impact than a change in unemployment benefit level, and through simulations come to the conclusion that a cut in unemployment insurance is twice as efficient if it affects the duration of unemployment benefits rather than the level. Moreover, they find that the probability of unemployment ending is higher when a claimant would reasonably expect benefits to be terminated, even if they are extended.

To recapitulate, the standard result of a positive association between the level of unemployment benefits and unemployment is based on assumptions that do not approximate the conditions prevailing in OECD countries. This theoretical connection ignores the institutional structures regulating the administration of unemployment and welfare benefits. What is more, the monitoring of benefits is completely unexamined. Starting from the empirical side of the question we are led to similar conclusions: empirical evidence in favor of an association between unemployment benefits and unemployment is weak. On the contrary, there is evidence linking duration of unemployment benefits with duration of unemployment. In the next part, we present a model linking the institutional structures and administration of unemployment benefits, and in particular monitoring by employment agencies, with levels of unemployment. This model presents comparative statics consistent with the empirical findings.

2. MONITORING UNEMPLOYMENT BENEFITS

Consider the interaction between the unemployed and the unemployment agency. The unemployed claims that he or she fulfills the requirements for unemployment compensation. Such requirements are most of the following: that the person did not quit the job voluntarily or as a result of misconduct; that he or she has not been working part time; that he or she make genuine efforts to find work, or that he or she is available for work, and willing to accept a job if one is offered; that the person's previous employer paid the necessary contributions into an unemployment insurance fund; and that he or she pass a means test. After receiving such a petition the unemployment agency checks whether the claims are correct, and either pays or withholds the appropriate amount. Now this interaction may be repeated over time, in order to verify that the status of the individual claimant has not changed, or, in the event that unemployment lasts for a long period, to move a person from unemployment insurance to unemployment assistance. As was made clear in section 1, not all persons apply for unemployment benefits, and of those who do apply some are refused because they do not qualify. Because the interaction of agency and unemployed occurs over time, so does the process of disqualification. A person initially offered unemployment benefits may be dropped subsequently from the list (because, for example, she was offered a job several times and did not accept it). Con-
versely, a person initially disqualified can be reinstated, because of an appeal process or because the period of disqualification has ended.

We will simplify this process by considering it as a one-shot interaction. We will divide the population of unemployed into “meritorious” and “non-meritorious.” The first group is one which fulfills all the requirements of the unemployment compensation system of a given country, while the second is one which lacks at least one of the required qualifications, and therefore is not entitled to unemployment benefits according to the law. We want to investigate whether this non-meritorious category gets artificially inflated by increases in benefits. That is, whether more generous benefits increase the numbers of claimants who are non-meritorious because they provide incentives to this group to exit employment and claim, or to refuse offers of employment and claim.

The difference between the meritorious and non-meritorious is that the first will apply more frequently, since they have nothing to lose from scrutiny of their applications, while the second will apply only if they think there is a reasonable chance that they will be granted the benefits. We will distinguish two cases: In the first (and simpler) story, the meritorious will have a dominant strategy to apply. In the second, the meritorious will not have a dominant strategy, and they will be deterred by a "sufficiently high" frequency of scrutiny by the agency. We include this second story because some accounts indicate that sometimes even meritorious people do not apply for benefits because of lack of information, or because they are deterred by means tests, or because of other transaction costs (Atkinson and Micklewright 1991: 693–94). The appendix will demonstrate that the two stories lead to identical outcomes, so the narrative (in this section) will follow only the first.

The agency has the task of investigating whether a particular claim comes from a meritorious person and granting it, or from a non-meritorious person and rejecting it. The game is presented in Figure 1.

In this game, a person is meritorious (with probability x) or non-meritorious (with probability 1−x). Then, the person has the choice of making an application to the unemployment agency. Finally, if an application is made, the agency decides whether to scrutinize it or not. If it scrutinizes, it will grant the applications of meritorious people and reject the applications of non-meritorious people. If it does not scrutinize, it will grant all applications automatically.

Let us focus on the incentives of the agency. If all people were meritorious it would prefer to grant all claims without scrutiny. If, however, the percentage of non-meritorious claimants is high, then the agency has to step up the

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3 The standard game-theoretic representation of the fact that the agency does not know whether a particular person is meritorious or not is a move by “nature” in the beginning of the game. For a similar tax compliance game, see Graetz et al. (1986)
monitoring effort in order to screen people more effectively. Note that this account of the agency seems to ignore other players in the game, such as elected politicians who instruct the agency how to behave, or the electorate who may be more or less sensitive to arguments about the overwhelming public expense of the unemployed. This impression is incorrect. Changes in the political environment will be reflected in the agency's payoffs. For example, "turning the screw" on the unemployed will result in an increase in the negative payoff to the agency when non-meritorious applicants receive unemployment benefits.

Formally, the assumptions can be presented by the following inequalities of the payoffs of the different players:

Assumption 1: The non-meritorious unemployed prefer to apply when they will not be scrutinized, and not to apply when they will be scrutinized. Formally: \( b_1 > c_1 > a_1 \), \( b_2 > a_2, c_2 > d_2 \)

Assumption 2: The meritorious unemployed prefer to apply.\(^5\)

Assumption 3: The agency prefers to scrutinize non-meritorious applicants \( (c_2 > d_2) \) and to not scrutinize meritorious applicants \( (b_2 > a_2) \).

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^4 A very interesting argument along these lines has been offered by Atkinson (1990) in order to account for the "turning of the screw" on British unemployed in the 1980s.

^5 See the appendix (part b) for the case where assumption 2 is replaced by assumption 2': \( b_1 > c_1 > a_1' \) where \( a_1' > a_1 \).
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Under assumptions 1, 2, and 3, the non-meritorious unemployed will apply if they will not be scrutinized or if the probability of being caught and stigmatized is low. Similarly, the agency will try to keep scrutiny at levels high enough to deter the non-meritorious from applying. But where are these thresholds?

The calculations of the equilibrium strategies of the two actors are presented in the Appendix. These calculations indicate that the non-meritorious will always apply with some positive probability. This probability is calculated to be:

\[ p^* = \frac{x(b_2-a_2)}{1-x}|c_2-d_2| \] (1)

(1) indicates that when the proportion of meritorious applicants is high, then all the non-meritorious unemployed will apply. In fact, if

\[ x \geq \frac{c_2-d_2}{b_2-a_2+c_2-d_2} \] then \( p^* = 1 \) (2)

On the other hand, the agency, once it receives an application, believes it comes from a meritorious applicant with probability:

\[ p(M/A) = \frac{(1-x)p}{x+(1-x)p} \] (3)

As a consequence, the agency will scrutinize with frequency:

\[ q^* = \frac{b_1-c_1}{b_1-a_1} \] (4)

Equations (1) to (4) describe the equilibrium strategies of the players in the unemployment monitoring game. We can use them to investigate the consequences of a series of modifications in the administration of unemployment benefits. For example, what happens if there is an increase in the size of the benefits, or the duration of the benefits, or the proportion of unemployed, or the composition of the unemployed (the ratio of meritorious to non-meritorious) in the system?

Let us identify first the consequences of an increase in the unemployment benefit. How is a change in the unemployment benefit represented in our model? Such a change is reflected by the amount \( b_1 \) the applicants receive. However, this payoff does not figure as a parameter in the equilibrium strategy of the unemployed (meritorious or non-meritorious). These people do not apply with higher frequency when unemployment benefits increase. Equations (1) and (4) in our model indicate that an increase in unemployment benefits does not increase the proportion of non-meritorious to meritorious applicants. Instead, an increase in benefits has, as a consequence, an increase in the scrutinizing frequency of the agency. Conversely, a decrease in benefits reduces monitoring of the unemployment agency.

This conclusion may seem implausible, but it is a standard result of two-person games with mixed strategy equilibria (Tsebelis 1989, 1990: Bianco et al. 1990). Changes in the payoff of one actor are offset by modifications in the equilibrium strategy of the other actor. The reason is that in equilibrium both
players are indifferent between their two pure strategies. So, in order to make
the non-meritorious applicants indifferent between applying and non-applying,
the unemployment agency increases its monitoring frequency.

Let us now investigate the consequences of a change in the payoffs of the
agency. The logic developed above indicates that such changes will be reflected
in the behavior of the unemployed. Indeed if the political environment pressures
the agency to keep a watchful eye, resulting in an increase in the payoffs $a_2$
and particularly $c_2$, (the payoff for discovering and rejecting non-meritorious
applicants), the number of frivolous applications will go down. Consequently
changes in the payoff of monitoring for the unemployment agency will have
an impact on unemployment.

One interesting application of this reasoning is the problem of workfare.
Several governments (U.K., U.S., Sweden) provide unemployment benefits that
are conditional upon enrollment in some educational or work-training pro-
gram. What is the impact of such policies, according to our model? Workfare
programs have trivial monitoring costs per se. Their overall cost is very high
because they require educational and administrative personnel, but these peo-
ple do not have to investigate whether the participants are “meritorious” or not.
Participation in the program is equivalent to merit. The program design con-
tains a “built-in” monitoring mechanism without any further specific action by
agency officials. Consequently, cheating goes to zero according to our model.

King and Ward (1992) have made the claim that traditional unemployment
benefit programs create pooling equilibria where “all unemployed people
will claim,” and that workfare schemes generate a “partial separating equilibrium
under which some claimants identified by the state as undeserving are dis-
couraged from seeking benefits.” While the intuition that workfare reduces
cheating is correct, King and Ward (1992) fail to identify the mechanism by
which the result is obtained. In their model all strategic interactions between
monitoring and monitored are ignored and replaced by exogenously given prob-
abilities. Consequently, according to their model, traditional unemployment
benefit programs do not have any built-in “deterrent,” while the deterrent of
workfare programs is that participants have to work. But if both meritorious
and non-meritorious apply in traditional programs, as they imply, either there
would be no disqualifications (if there is no monitoring), or disqualifications
would be much higher (if there is monitoring). Since monitoring is absent in
their model, variations in the level of benefits would result in variations in the
level of unemployment, exactly as in the economic models reviewed in the first
section of this study.

Our model predicts that deterrent mechanisms resulting from monitoring
exist both in traditional unemployment programs and in workfare programs.
The difference is that the payoffs of the monitoring agency differ systematically
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(monitoring is built-in in workfare), and consequently they lead to different aggregate levels of cheating. While workfare in the King and Ward (1992) article characterizes right-wing governments exclusively, in our model there are two different reasons for adopting the same kind of program: either the goal is to reduce cheating (a "right wing" reason) or the goal is to train workers for a constantly changing economic environment (a "left-wing" reason).6

Suppose now that the total number of unemployed increases. The simplest assumption is that such an increase, by itself, will not modify the proportion (x) of meritorious people in the pool. We will investigate the consequences of this assumption, and discuss changes in x in the next paragraph. If unemployment rises and x remains unchanged, the payoffs of the agency are changed since scrutiny becomes more difficult. As a consequence the number of frivolous applications increases.

Suppose that the proportion of the meritorious unemployed (x) decreases. This modification of x has no consequence on the monitoring behavior of the agency. It is the equilibrium strategy of the non-meritorious unemployed that is affected. The number of frivolous applications goes down, so that the percentage of frivolous to non-frivolous applications remains the same. In fact, the ratio x/(1-x)p* remains constant,7 except when the percentage of meritorious unemployed is so high that all non-meritorious unemployed find it profitable to apply (a so-called "corner solution").

Our conclusions sharply contrast with the search models in economics. They argue that an increase in unemployment benefits decreases search costs, and consequently increases the length of search for all unemployed, which in turn increases the rate of unemployment. We argue that the introduction of a monitoring agency alters this result in a dramatic way. First, modifications of the payoffs of the unemployed get absorbed by the behavior of the agency. Second, even modification in the composition of the unemployed (which may result from a change in benefits) are absorbed by changes in their behavior, since when the number of the non-meritorious increases, they apply less frequently.

The comparative statics of this model can help us make a series of predictions about unemployment benefits and their consequences on unemployment. As we explained, according to our model, the size of unemployment benefits

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6 Our examination of the policies of various countries suggests that these two purposes are very often present at the same time, and are pursued equally by governments of different political complexions. Our model implies that there is no analytical value added gained by distinguishing between a "left-wing" or "right-wing" basis for workfare.

7 The reader can verify this statement by replacing p* from equation (1) in this ratio.
has no effect on unemployment but increases monitoring. Consequently, if we apply our reasoning to different countries we would expect that:

- Countries with high benefits do not have different unemployment levels from countries with low unemployment benefits.
- Countries with high benefits will have a more developed monitoring apparatus.

Application of the same model in cross-country comparisons indicates that a change in the duration of unemployment benefits will not affect the behavior of people: meritorious and non-meritorious unemployed will continue applying at the same proportion. But while the number of unemployed at any period of time will not be affected, these people will remain in the public payroll for longer periods of time, so the aggregate unemployment level will rise. In other words:

- Countries with long duration of unemployment benefits will have high levels of unemployment.

Finally, since in periods of high unemployment the non-meritorious unemployed increase the number of their applications, while the agency continues monitoring at the same rate, the number of rejections will increase disproportionately. So,

- In periods of high unemployment, rejections of unemployment applications increase disproportionately.

In the next section we test these propositions empirically.

3. **Monitoring Unemployment Benefits in Comparative Perspective**

The model in the previous section provides propositions which can be tested both over time and cross-nationally. For empirical tests we divide this section in two parts. In the first part we draw on experiences of seven OECD countries over the last two decades which prove to be consistent with our model. In the second section we present cross-national comparisons with OECD data.

Each of these sections presents significant shortcomings. The interpretation of illustrative evidence taken from the historical experiences of a group of countries naturally focuses on experiences that are congruent with our model. There may be other plausible explanations that account for some of them. However, we know of no other theory that accounts for all the evidence presented in the case studies as well for all the cross-national comparisons we present in the second part of this section. The cross-national comparisons are more systematic but, like any regression model, are based on the unrealistic assumption that the different countries come from the same distribution. We will address this assumption below.

We rejected a pooled time series analysis for two reasons. The first is that the main time series required for our model (that is variations in the size of
monitoring mechanisms) does not exist for any country. The second is that even if such time series existed, increased monitoring does not necessarily translate immediately into an increase in the number of inspectors in the unemployment agency. Consequently, without having a model of government reaction to agency insufficiencies, we can only test the proposition that increased unemployment benefits will cause increased monitoring on the average.

(1) Case studies

In this section we will sketch the recent experience of seven OECD countries (Sweden, Ireland, Canada, Britain, Germany, France, Australia). These countries were chosen because they represent a rich series of contrasts along significant dimensions: for example the role of insurance versus assistance, the budgetary constraints faced by each government, the level of unemployment and the different policy changes experienced.

Sweden: In Sweden benefits are "generous" by the standards of other countries. The initial gross replacement rate of unemployment benefits for a single person is 90 percent, the highest of all OECD countries (OECD 1991a: 201). Supervision of the unemployed is also high. There is one staff person in the unemployment offices for every fourteen unemployed, which is the lowest ratio in all OECD countries (OECD 1991a: 213). The relationship between high benefits and high levels of monitoring seems to be confirmed, at least, by this limiting case.

There was a significant rise in the real value of benefits in the late 1970s and early 1980s. Bjorklund and Holmlund (1989) established, as noted, that there seemed to be no benefit-induced unemployment. Our model suggests that we would see an increase in monitoring in conjunction with this rise in real benefits, and in fact, following a 1979 report, there was an increase in the number of Labor Market Board personnel allocated to placement activities (Standing 1988: 109).

Active labor market expenditures changed in character at the same time, from increasing the efficiency and flexibility of the labor market to the use of subsidies to keep people in jobs or public works, and therefore out of the job market (Standing 1988: 113). For these workers the government avoided playing the monitoring game.

Youth unemployment was addressed with a combination of both monitoring and government job creation. This had the effect of limiting their access to benefits. A report from the Ministry of Labor remarked: "the right of 18–19 year olds to a youth team job replaces their rights to unemployment benefits" (Standing 1988: 111). The role of monitoring and workfare programs seems to be especially significant for this group in all countries that we examine.

In conclusion, Sweden is generous in benefits and monitors them closely,
while also using job subsidies and job training. These other strategies (among other things) limit the need to monitor. By 1985, while the "open" unemployment rate was 3 percent, a further 3.5 percent of those employed were in labor market schemes (Standing 1988: 107).

Ireland: Unemployment in this country has been persistently the highest among OECD countries, nearly twice that of the OECD average and between 1980 and 1988 it more than doubled (OECD 1991b: 43). This had two consequences. By 1989 total unemployment benefits, combined with the cost of the Training and Employment Authority (TEA), was about 4.8 percent of GNP. This severe fiscal constraint was relieved only by contributions from the European Community.

The second consequence was increased cheating. Notwithstanding the fiscal difficulties, the Irish government increased monitoring and job creation (remember always that monitoring is costly compared, for example, to low levels of benefits paid permissively). In 1986 an External Control Unit was added to an existing Special Investigation Unit, signaling the increase in monitoring. About 7,000 initial claims for unemployment benefits were rejected in 1989, about 7 percent of total applications (Department of Social Welfare (DSW) 1989: 78). A training program was established by the Labor Services Act, 1987, and refusal of a place in these schemes was grounds for loss of benefits (DSW 1988: 75). Young people in particular had to be engaged in a training program or involved in social employment.

To sum up, Ireland, a country with relatively low benefits (OECD 1991a: 201), faced a double difficulty in the 1980s: overwhelming levels of unemployment and severe fiscal constraints. Despite low benefits monitoring was increased and "workfare" type programs instituted because, we suggest, the non-meritorious had a dominant strategy to cheat as a result of the presence of so many meritorious in the pool of unemployed. The government also attempted to move people out of the monitoring game altogether using job creation.

Canada: This country has an unemployment benefits system based on the insurance principle only. The first oil shock caused a jump in unemployment; between 1974–79 it averaged 7.2 percent (OECD 1991b: 43). One response was to increase monitoring through the regulatory powers of the Unemployment Insurance Commission. The number of benefit control officers was doubled, and the number disqualified each month rose from 9.1 to 14.5 percent between 1972–74. In 1975 new rules on registration, interviews and employment records were instituted (Pal 1988: 45). This confirms our proposition that disqualifications increase disproportionately under circumstances of rising unemployment.

Canada pursues a "permissive" entitlement strategy. The result is that generous payments and low levels of monitoring make the incentive to work and claim
low. The problem of those who claim without seeking work might be overlooked because the duration of Canada's benefits is low in comparison with all other OECD countries (OECD 1991a: 201). A time limit on benefits, rather than supervision of the clients, is Canada's strategy in response to the monitoring problem.

In conclusion, a rise in unemployment was accompanied by a disproportionate rise in disqualifications, as predicted by our model. Paying benefits for a short period seems to be an alternative to the difficulties, and expense, of monitoring.

Britain: The new Conservative government in 1979 believed that there was insurance-induced unemployment (Brown 1990: 51). Therefore policies were introduced that had the overall effect of lowering benefits. Cost-of-living increases in Unemployment Benefit (UB) were restricted, Earnings Related Supplement (ERS) and dependent child payments eliminated and the qualification requirements stiffened. This seems to be a strategy of simple cuts in benefits, rather than choosing a conditional (and expensive) welfare game. This is congruent with our model: low benefits are accompanied by low levels of monitoring.

Atkinson and Micklewright (1989: 23) note that the real level of the UB had recovered by 1984 and had improved slightly by 1985, before falling back to 1979 levels by 1987. It was at the point when benefits started to rise, following the Social Security review of 1984, that there was a change in strategy by the British government toward a policy of monitoring. This accords with our model: large numbers of unemployed and low levels of monitoring resulted in a dominant strategy for the non-meritorious to "cheat." As benefits rose, so too did the importance of monitoring.8

A different story, also consistent with our model, is that monitoring was low because the non-meritorious had been deterred by the increased interest of the Conservative government in catching them. But this is not consistent with the following report of the National Audit Office: in 1985 the National Audit office criticized Unemployment Review Officers for failing to review adequately the claims submitted for benefits. There were about 100 officers in the 70s; by 1988 their numbers had been increased to 796. Other changes were made that included new and more exhaustive questionnaires for the unemployed, weekly self-reporting, increased penalties for voluntary dismissal, interviews, tightened work availability rules, and a new category of monitors for the newly unemployed, New Client Advisers. Disallowance of benefits rose from 39,000 in 1981 to 101,000 in 1987, which confirms our prediction that disqualifications rise during periods of high unemployment, (Brown 1990: 178–203).

8 A policy of monitoring was also made possible because of the improvements in the government's fiscal position. Government share of GDP peaked in the years 1982–1984 and declined steadily thereafter (OECD 1991b: 68).
In summary, the British experience in the recent past shows a range of policy responses. Lower benefits and lower monitoring were followed by a change in course in which monitoring was increased due to the combination of a rise in real benefits and an easing of the fiscal constraints on the government; in addition, disqualifications rose as unemployment rose, as our model suggests.

Germany: In Germany all benefits to the unemployed are part of a larger, fully integrated set of active labor market policies. The benefits are a fairly high percentage of previous wages, between 58 and 63 percent (International Labor Office (ILO) 1986: 114). As our model would predict, the Federal Republic monitors those claiming benefits fairly closely. The Federal Labor Office has wide powers to promote certain trades, and powers to direct and constrain beneficiaries (Kerschen and Kessler 1990: 276–77).

Germany too faced the challenge of increased unemployment in the late 1970s and early 1980s: the rate rose from 3.3 percent in 1979 to 8.0 percent in 1985 (OECD 1991b: 43). This resulted in increased monitoring, which attracted significant political debate. In 1982 there were changes made in the availability rule in which work further from home was now considered acceptable, and in which work not commensurate with a person's skills had to be accepted after a reduced grace period (Karach 1983: 70–71). In fact disqualifications rose throughout the decade; there were 18,000 in 1984 and 36,000 in 1989 (BAS 1990: 30–31). In Germany, too, increased unemployment resulted in increased monitoring and increased disqualifications.

France: While unemployment insurance payments have been generous in France in the past, in the late seventies they amounted to as much as 90 percent of previous earnings, by 1991 they had declined to 60 percent (OECD 1991a: 201). After all allowances are exhausted there is a sharp drop in level of benefits, which are paid as a form of general assistance (which is indefinite in duration, except for those under 25) (ILO 1986: 117). The government in France avoids the monitoring game, it seems, by paying high levels of benefits to the short-term unemployed, but very low levels of benefits to the long-term and youth unemployed. The prospect of the sharp decline in benefits has the effect of increasing the intensity of the job search, as noted by the OECD (1991a: 206) and Florens et al. (1990a).

The French government resorted to other strategies that kept people out of the monitoring game in response to the high levels of unemployment in the 1980s. Between 1982 and 1983 the money spent on promoting early retirement rose from 28 to 50 billion FF per annum (SES 1986: 404). By this means many older workers were taken off the unemployment rolls. Job subsidies, "enterprise" allowances, and shortened working hours were also used to keep people out of the ranks of the officially unemployed.

Another interesting aspect of the French system is the way costs, such as
the costs of training, are imposed on private sector employers (SES 1986: 179). This reflects a pattern of policymaking in which administrative responsibilities and costs are minimized or shared with other actors.

In the face of high unemployment, and a crisis in finance of the unemployment system, France lowered benefits and pursued other strategies designed to avoid costly monitoring. While we have an explanation for the way benefits and monitoring are related, it is important to remember that we do not claim to account for the level of benefits—in part, in the French case among others, this may be a function of institutional capacity (as is discussed further below).

Australia: This country historically has paid low levels of benefit permissively, that is with low monitoring. In 1983 unemployment jumped to almost 10 percent and remained stubbornly high for the next five years. The Australian system had a limited capacity to monitor, therefore cheating became a dominant strategy for the non-meritorious. In order to move the non-meritorious off this "corner solution," we would expect an expansion of the monitoring apparatus, even though benefits were low ($q^*$, the likelihood of the agency scrutinizing, rises if the probability of payoff $c_1$ to the non-meritorious, the payoff for not applying, becomes zero). In keeping with this there was a radical departure in monitoring in 1986 with the establishment of mobile review teams, in combination with an intensified program of general reviews by regional office staff. The result in 1989–90 was over 25,000 disqualifications of unemployment beneficiaries (Department of Social Security (DSS) 1990: 111). These disqualifications were the direct result of a new emphasis on monitoring (DSS 1990: 109).

Conclusion: Our core proposition is that high benefits require high levels of monitoring. The rise in benefits in Sweden and the decline in benefits (at first) in Britain were accompanied by the appropriate rise/decline in monitoring. In periods of high unemployment disqualifications increased in Canada, Germany, Britain and Australia, as our model also predicts. Although small changes in the propensity to cheat by the non-meritorious leave the equilibrium level of cheating unchanged in our model, we identify several instances in which the lack of monitoring combined with high unemployment has caused these "non-meritorious" to pursue a dominant strategy. This has resulted in an expansion of the monitoring capacity by the governments involved, in spite of a low level of benefits. We have also observed how monitoring is avoided by adopting alternative strategies, and the special interest of all countries in the training, education and socialization of younger workers.

(2) Cross-national comparisons

Here we report a series of statistical results designed to test some of the predictions of our model, in particular those that could not fruitfully be examined in the descriptive section above. The underlying assumption of such a com
parison is that the observations come from the same distribution. This assumption is violated because, as we pointed out, the institutional structures of unemployment benefit administration vary widely from country to country.

Let us discuss these differences in institutional structures further, because our argument is that the fit of our model ($r^2$) is low because of these differences. The objection might be raised that a systematic study of these differences would completely cancel out our findings. However, such an objection, to be sustained, requires such a (very welcome) systematic study. For the time being let us merely illustrate the differences that our empirical test will necessarily ignore.

In Canada the institutional autonomy of the Unemployment Insurance Commission, which played no part in active labor market measures (i.e., job training, etc.), did not end until it was amalgamated with the Department of Manpower and Immigration in 1975 (Pal 1988: 132). There have never been “workfare” type programs, and the most recent commission to review unemployment policy, the Forget Commission in 1986, attempted to return the program to its “pure” insurance form and limit government subventions. The absence of monitoring is clearly partly the result of Canadian institutional arrangements.

Unemployment insurance is managed in France by the National Occupational Union for Employment in Industry and Commerce and a public-sector counterpart, the Association for Employment in Industry and Commerce. These are private law institutions managed jointly by the peak associations of labor and capital. Entirely separate from this arrangement is the Ministere du Travail, de l'Emploi et de la Formation professionelle. It is this ministry which spent 11 billion FF on active labor market policies in 1983 (SES 1986: 177, 404). This institutional separation is also, we suggest, partly responsible for the low level of monitoring in France.

Let us turn now to empirical tests which rely on cross-national data supplied by the OECD (OECD 1990, 1991a, 1991b). The data are reproduced in Table 1 and the results are listed in Table 2.

Many of the relationships we report are bivariate. The reason is that our purpose is to show that some significant relationship exists between, for example, monitoring and the level of benefits. We do not propose a comprehensive account, in which most of the significant variables are captured. For this purpose bivariate analysis is adequate, unless other variables exist which obviously confound the analysis. We attempt to identify such cases when they occur.

We began by regressing benefits against unemployment. Benefits are expressed as a proportion of an average production worker's wage in each country. This captures their “generosity” relative to the income level for each country. Unemployment is an eight-year average, in order to smooth away cyclical or stochastic economic factors. As reported on line 1 there seems to be a weak
# Table 1

**Variables Relating to Unemployment, Benefits and Monitoring**

<table>
<thead>
<tr>
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<td>19.9</td>
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<td>–</td>
<td>–</td>
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<tr>
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<td>80</td>
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<td>14.3</td>
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<tr>
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<td>60</td>
<td>2.7</td>
<td>111.8</td>
<td>32.6</td>
</tr>
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<td>11.2</td>
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<td>–</td>
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</tr>
<tr>
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<td>52</td>
<td>10.1</td>
<td>43.67</td>
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<tr>
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<td>26</td>
<td>7.6</td>
<td>0</td>
<td>14.8</td>
</tr>
</tbody>
</table>

$^a$A measure of the degree to which the unemployed are monitored, this is the average number of unemployed per staff person in the unemployment service. We inverted it (making it the fraction of a staff person per unemployed). Drawn from Column 1, Table 4, OECD 1990: 32.

$^b$A measure of unemployment benefits expressed as a fraction of the salary of the average production worker in each country, (Initial Gross Replacement Rate). Drawn from column 7, Table 7.2, OECD 1991a: 201.

$^c$A measure of the maximum duration of initial benefits in weeks, assuming that the unemployed satisfied the employment record requirement. Drawn from Column 4, Table 7.2, OECD 1991a: 201.

$^d$Average unemployment for the period 1980–87, drawn from Table 2.15, OECD 1991b: 43.

$^e$An index of the history of left governments for a selection of countries, developed by Wilensky (1981). Each country is given from zero to three points for each year of leftist (Communist, Socialist, Social Democratic, etc.) participation in government depending on their role in any governing coalition.

$^f$Government employment as a percentage of total employment in 1985. This year was chosen as being the most recent year in which data is available for all OECD countries. Year to year change in this number tends to be incremental. Drawn from Table 2.13, OECD 1991b: 42.
Table 2

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Sign</th>
<th>Beta (corrected)</th>
<th>t-stat</th>
<th>r squared (corrected)</th>
<th>n</th>
</tr>
</thead>
<tbody>
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<td>UNEMPAVG</td>
<td>BENEF</td>
<td>-</td>
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<td>1.21</td>
<td>0.08</td>
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<td>1.28</td>
<td>0.10</td>
<td>17</td>
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<tr>
<td></td>
<td>LEFT</td>
<td>-</td>
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<td>0.73</td>
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<td></td>
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<td></td>
<td>GVTEMP</td>
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<td>0.19</td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Inasmuch as benefits are a political choice, perhaps the problem with the "common sense" view (that high benefits induce unemployment) has less to do with the strategic interaction we examine, and more to do with the fact that governments of the "left" prefer high levels of benefits and low levels of unemployment (and governments of the "right" the reverse). In that event we would expect a significant result from regressing measure of "left" government and the level of benefits against unemployment (admitting beforehand the collinearity between the two variables). As reported on line 2, neither variable appears to be significantly related to unemployment. In the case of left governments, the fact that we are dealing only with the eighties, as opposed to whole post-war period, may explain the lack of a connection. We also regressed left government against level of benefits, to check whether there was a relationship, and as reported in line 3 the connection is a weak one.

Since there is only a weak relationship between left governments and the level of benefits, it is not surprising that there is also only weak connection between left governments and monitoring, as reported in line 4. This is because a basic implication of our model is that high benefits lead to high levels of

---

9 A problem with the index of left government used (see Table 1 for a full definition) is that it only includes governments up to the end of the 1970s. However, due to the way participation in government is scored, change in the political composition of governments in the 1980s will not have a dramatic effect on it.
monitoring, not to high unemployment. This is examined directly in line 5, where a strong connection, confirming our model, is discovered (between benefits and monitoring). Left government and level of benefit are regressed together against level of monitoring in line 6, and benefits still prove to be significant, while the connection with left government remains a weak one (note that n is very low in this case).

With our next test, reported in line 7, we discovered a weak positive relationship between duration of benefits and unemployment, which the model also predicts. We were unable to find a measure of duration of benefits that captured changes in the rules over the eight-year period. While these changes may not be insignificant, we take the rules on duration reported in OECD (1991a) as a reasonable proxy for the rules as they operated in the 1980s.

To summarize, the "common sense" view of benefit-induced unemployment is not consistent with our data. Nor does there seem to be a strong relationship between left government, unemployment, or level of benefit. However, level of benefit does significantly influence the level of monitoring, as we argue. Finally, the relationship between the duration of benefits and unemployment is weak but positive, as suggested by our model and the empirical findings of others.

CONCLUSIONS

The predominant economic approach on unemployment benefits summarizes the benefit policy of a country by the size of benefits, and expects unemployment to increase with the size of benefits. Along with several economists (Atkinson and Micklewright 1991) we argued that the institutions regulating benefits should be introduced into the picture. Moreover, we argued that one important aspect of the question has been completely ignored by the literature: monitoring of unemployment benefits.

We proposed a simple monitoring game between unemployment agency and unemployed population. The conclusions of this game are very different from existing economic (see first part) or decision theoretic (King and Ward 1992) approaches. In particular the predictions of our model are consistent with a series of facts:

- The effect of unemployment benefits on unemployment is either nonexistent, or very small. According to our crude cross-national data it is even negative.

10 However it is possible that monitoring is a function of the general level of government employment. Therefore we ran a multiple regression in which benefits and government employment as a share of GDP in each country were regressed against monitoring. The results in line 8 show that benefits remain significantly related, while the result for government employment is not significant.
There is a cross-national moderate effect of duration of unemployment benefits on unemployment.
The size of unemployment benefits affects the intensity of monitoring (size of unemployment agency).
Countries with high participation of the Left in government monitor more than countries where the Right predominates.

Appendix

Part A: The meritorious have dominant strategy to apply. The reader is reminded of the assumptions from the text:
Assumption A1: \( b_1 > c_1 > a_1 \)
Assumption A2: meritorious unemployed always apply.
Assumption A3: \( b_2 > a_2, c_2 > d_2 \)
Assumption A4: the proportion of meritorious is \( x \).

Calculations of equilibrium strategies:

\[
\begin{align*}
\text{EU}_{\text{NA}} &= c_1 \\
\text{EU}_A &= qa_1 + (1-q) b_1 \\
\text{EU}_{\text{NS}} &= xb_2 + (1-x) d_2
\end{align*}
\]

The beliefs of the agency when they receive an application are given by Bayes’ rule:

\[
p(M/A) = \frac{[1-x]p}{[x+(1-x)p]}, \text{ and } p(NM/A) = 1-p(M/A)
\]

On the basis of these beliefs, the expected utilities of the agency’s pure strategies are calculated as follows:

\[
\begin{align*}
\text{EU}_s &= xa_2 + (1-x)p_c_2 \\
\text{EU}_n &= xb_2 + (1-x)pd_2
\end{align*}
\]

In equilibrium each player is indifferent between his (her) pure strategies. Setting the first two expected utilities equal to each other we get

\[
q^* = \frac{(b_1-c_1)/(b_1-a_1)}
\]

Similarly, from (4A) and (5A) we get

\[
p^* = \frac{x[b_2-a_2)}{(1-x)[c_2-d_2]}
\]

Equation (6A) and (7A) present the following situation: The monitoring agency will always monitor with a probability which depends on the payoffs of the monitored player. The monitored player will always cheat with some probability. However, under certain conditions cheating occurs with probability 1.

From (7A) if \( x > (c_2-d_2)/(b_2-a_2+c_2-d_2) \), then \( p^* = 1 \)

Part B: The meritorious do not have a dominant strategy.

Assumption A1: \( b_1 > c_1 > a_1 \)
Assumption A2': \( b_1 > c_1 > a'_1 (\text{with } a'_1 > a_1) \).
Assumption A3: \( b_2 > a_2, c_2 > d_2 \)
Assumption A4: the proportion of meritorious is \( x \).

From assumption A2' follows that meritorious and non-meritorious can-
not be indifferent between applying and not applying at the same time (for the same frequency of scrutiny). In addition, non-meritorious are more easily deterred than the meritorious. Consequently, there are two candidates for equilibrium: Equilibrium 1. All meritorious apply, and non-meritorious mix. Equilibrium 2. All non-meritorious do not apply and meritorious mix.

It is easy to see that Equilibrium 1 is identical to the equilibrium calculated in part A. Moreover, it is easy to demonstrate that equilibrium 2 does not exist: Indeed, if the frequency of scrutiny is so high as to deter the non-meritorious, every applicant would be a meritorious one, in which case the agency would not scrutinize at all. Consequently, under assumptions A1, A2', A3, and A4 the only equilibrium is identical with the one calculated under assumptions A1, A2, A3, and A4.11

REFERENCES


11 What produced the identity of results of the two models (part A and B of the appendix) is the assumption that the meritorious are less easily deterred than the non-meritorious. Consequently, the phenomenon reported by Atkinson and Micklewright (1991, 1693–94) that meritorious are deterred indicates that these people have a different preference profile from the one postulated here; either they have a dominant strategy of not applying (because of ignorance for example) or are more easily deterred than the non-meritorious (because they are more sensitive to the humiliation produced by scrutiny or by (an always possible) rejection.


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