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CAN ACTIVE LABOUR MARKET POLICY WORK? SOME THEORETICAL CONSIDERATIONS

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ABSTRACT

Persistent high unemployment in Europe has led to renewed interest in Active Labour Market Policy. However, most existing theory suggests that its effects are ambiguous at best. We argue that job search assistance and wage subsidies are more appropriately modelled as a transition rather than the state-based approach of existing theory. This eliminates the ambiguity. We present two main models, one in which negative duration dependence in unemployment arises from state dependence, the other where it is due to heterogeneity. In both cases policy is unambiguously effective provided it is targeted on those who are, or are most likely to become, long-term unemployed. Some crude estimates suggest that Active Labour Market Policies could have a significant, though not spectacular, effect in reducing unemployment.

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James Richardson

The persistence of high unemployment in much of western Europe has led to renewed interest in Active Labour Market Policies (ALMPs). Yet although there is a wealth of micro level studies (see OECD, 1993 for a survey), there have been few attempts to model ALMPs explicitly in a macroeconomic context. This is despite the fact that success of the programmes at micro level is neither sufficient nor necessary for ALMP to reduce aggregate unemployment: successful programme effects may simply substitute one group of unemployed for another, or be offset by increased wage pressure (Calmfors and Forslund, 1991; Calmfors and Lang, 1995). Conversely, even apparently useless schemes may be effective by reducing wage pressure among workers keen to avoid ending up on them (Jackman, 1994).

Compounding the difficulties in interpreting the micro-level studies, most of the attempts at macroeconomic modelling have concluded that the effect of policy is ambiguous (Holmlund and Lindén, 1993; Aarnio, 1993; Jackman, 1994; Calmfors and Lang, 1995). Typically, increased competition for jobs among the unemployed and improvements in the matching process are offset by reduced welfare loss for the unemployed and possible reduced search whilst on programmes, leaving the overall effect uncertain. At a time when governments are being urged to allocate increased resources to Active Labour Market Policy, the message is far from clear.

However, we argue that the ambiguity in existing models arises out of a view of Active Labour Market Policy that is not universally applicable. An understandable tendency to model policy along Swedish lines has led to an emphasis on scheme-based ALMP, where policy is seen as the creation of an explicit state into which unemployed workers are placed. Exit rates both during and after scheme-participation, together with in-scheme conditions, offer a host of policy parameters and consequent scope for ambiguity.

By modelling policy as a transition, rather than a state, we are able to obtain simple and unambiguous effects. Provided policy is targeted on those who are, or who are most likely to become, long-term unemployed, ALMP leads to a fall in equilibrium unemployment. We believe that this approach is particularly suited to modelling job search assistance and wage subsidies. We present two main models, one in which negative duration dependence among the unemployed is a consequence of state dependence, and one where it is due to heterogeneity among the unemployed.

Section 1 below sets out the assumptions we make in modelling policy as a transition rather than a state, and considers the supporting evidence. Sections 2 and 3 consider the state dependence case with efficiency wages and union bargaining respectively. Section 4 sets out the basic heterogeneity model, whilst section 5 extends this to allow more explicit targeting on the long-term unemployed. Section 6 presents some simple calculations, whilst 7 concludes.

1. ALMP AS A TRANSITION

Active labour market policies can be divided into five categories (OECD, 1993): temporary job creation; training; job search assistance; wage subsidies for regular employment; and assistance for those starting their own enterprises. Of these only the first is unambiguously a separate state within the labour force. Trainees are arguably out of the labour force altogether, whilst the availability of job search assistance, wage or self-employment subsidies do not constitute a separate state into which the unemployed are placed, but rather act to increase transition probabilities into regular (or self) employment. Wage formation in self-employment is not adequately captured within our model, but such programmes are inevitably on a limited scale since self-employment is of interest to only a small subgroup of the unemployed (OECD, 1993). By capturing the effects of job search assistance and wage subsidies we consider that our transitions approach is at least as relevant as the predominant state-based models.

We model policy in the simplest possible way, as an increase in the relative outflow rate of those on whom the policy is targeted. It is easy to see within the models that this implies an increase in their absolute outflow rate as well, but overall outflow rates are of course endogenous, and therefore we do not assume this. Implicit in this is the idea of a matching function with the potential for productivity gains (Pissarides, 1990). However, we do not explicitly model search. As Calmfors and Lang (1995) show, the introduction of search does not affect the wage-setting schedule, but increased search will shift out labour demand, further enhancing the effectiveness of policy.

We take it for granted that well-designed programmes are capable of increasing the outflow rates of those who participate in them, at least relative to other unemployed workers. Furthermore, we assume that not all of this effect is simply ‘queue jumping’ at the expense of other members of the target group (although it may be at the expense of other unemployed workers not in the target group), so that the relative outflow rate for the target group as a whole rises. Alternatively, we could assume that the programme covers the whole of the target group so that the possibility of queue jumping within the target group does not arise.

Job search assistance is straightforward to model in this way. Such programmes do not carry the risk of reduced search for their duration, which is anyway typically very short. Nor do they generally involve enhanced benefit payments beyond some possible token element to cover expenses. Hence their sole effect is through increasing outflow rates of the target group. One of the few areas of agreement among the micro studies is that job search assistance programmes generally succeed in increasing outflow rates among participants (OECD, 1993).

Modelling wage subsidies as a transition involves a greater degree of simplification, but we do not believe it to be too far removed from the empirical evidence. Moreover, we are taking a deliberately pessimistic view of what wage subsidies can achieve.

The impact of wage subsidy programmes is generally disaggregated into four effects:

i) Deadweight: where the vacancy would anyway have been filled by someone eligible for the subsidy so that the hiring decision is unaffected.

ii) Substitution: where the vacancy would otherwise have been filled by another unemployed person from outside the target group, *eg* where a subsidised long-term unemployed person is hired in preference to an unsubsidised short-term unemployed person.

iii) Displacement: where firms receiving the subsidy are able to win orders at the expense of competitors, leading to a drop in labour demand in rival firms.

iv) Job creation: Net expansion of labour demand.

We consider only the case where deadweight is less than 100%, so that the subsidy has at least some effect. Provided that the programme has a reasonable degree of coverage and that the target group have a low initial outflow rate, this condition is certain to be met.

For simplicity, we will assume that displacement occurs through natural wastage rather than redundancies, so that the job separation rates are unaffected. Although difficult to measure, displacement effects are generally found to be quite small (Atkinson and Meager, 1994; Breen and Halpin, 1989), in part because subsidies are relatively low and most firms take on only one or two subsidised workers, so that this does not seem unreasonable. Hence displacement also involves hiring a subsidised worker at the expense of an unsubsidised one, where now the unsubsidised worker would have been employed at a rival firm. Thus we can treat substitution and displacement as essentially the same and refer to them both simply as substitution.

This leaves 'job creation'. All the micro studies identify this as the measure of success. Implicit in this view is the assumption that the policy acts by increasing labour demand at given wages, a view that can be traced back to Kaldor (1936) and Pigou (1933). However, the studies suggest that increases in labour demand are relatively modest, at most about one-quarter of the total. Even this may be an over-estimate, since studies are typically based on surveys of employers who may have an incentive to disguise substitution. That the effect on labour demand should be limited is not surprising, since subsidies are typically relatively small, around 50% of six months wages, and temporary.

Instead, we shall assume that there is no effect on labour demand, turning the conventional criterion of programme success on its head. Net of deadweight, we shall treat wage subsidies as having a pure substitution effect. It is easy to see that this is precisely equivalent to an increase in the relative outflow rate of those eligible for the subsidy, at given labour demand. Formally, therefore, we are providing an analysis only of the substitution effects of wage subsidies and not also of their labour demand effects. The neglect of the macroeconomic implications of these substitution effects in most past studies provides sufficient justification for this approach. The evidence also seems to suggest that it is substitution, not job creation, that is the largest effect of most existing schemes. Of course, to the extent that we are being too pessimistic about labour demand effects, wage subsidies will be even more effective than we suppose.

This does raise one further issue however: whether expiry of temporary subsidies will lead to higher separation rates for subsidised workers. Any well-designed policy will prevent employers continually replacing subsidy-expired workers with new subsidised recruits, but it is harder to ensure that they are not replaced with unsubsidised workers or simply laid off and not replaced at all[1]. However, if we assume that there is no effect on labour demand, then there is no reason to suppose that the job would be terminated as a consequence of expiry of the subsidy.

Nor does it seem likely that, after six months in the job, an employer would prefer to replace a subsidy-expired worker with an unsubsidised worker. On the contrary, evidence suggests that subsidised workers are found to be at least as productive as alternative recruits (Atkinson and Meager, 1994). There is little evidence on the subsequent employment durations of subsidised workers. However, Breen and Halpin (1989) found that 54% of workers hired under the Irish Employment Incentive Scheme were still with their employers eight months after subsidy expiry, whilst Arwady (1988), in a study of a single firm, found that US workers receiving the Targeted Jobs Tax Credit were retained for longer than unsubsidised workers.

2. STATE DEPENDENCE

Negative duration dependence of outflow rates is widely found in industrialised economies (Layard *et al*, 1991). Two competing explanations for this exist. State dependence argues that unemployment itself leads to reduced subsequent outflow rates, whilst heterogeneity assumes that people differ in their outflow probabilities, so that low exit rate types are disproportionately represented among the long-term unemployed. Of course the two are not mutually exclusive. We do not wish to come down on one side or the other of this dispute, but will demonstrate instead that policy is effective whichever is the dominant cause of negative duration dependence.

We model state dependence as a one-off fall in the relative outflow rate, after one period of unemployment. Unlike Calmfors and Lang (1995) who model duration dependence through a zero outflow state, this allows policy to be targeted on those who have already suffered duration dependence, whilst avoiding the algebraic complexity of a continuous process of decline.

Policy is then modelled as a reduction in the extent of state dependence, equivalent to an increase in the relative outflow rate of the long-term unemployed.

The model

We assume that wage determination follows the Shapiro-Stiglitz (1984) shirking model. This ensures that we capture the possible effect of ALMPs in increasing wage pressure through reducing the utility loss involved in unemployment (see for example Calmfors and Forslund, 1991; Calmfors and Lang, 1995). In Section 3 below, we show that union bargaining over wages leads to identical conclusions.

There is an exogenous probability of separation, s. After separation, a worker becomes short-term unemployed. If they fail to find a job within one period, they become long-term unemployed in the next period, and remain so until they exit. Exit rates from long-term unemployment are lower than from short-term unemployment by a factor, $0<\beta<1$, either because the long-term unemployed search less effectively or because employers discriminate against them.

Following Manning (1993), we allow that workers may exit from unemployment at the beginning of each period, and hence, following separation, workers have probability a of being immediately re-employed. This avoids the problem of unemployment being bounded below by the normal assumption that at least one period of unemployment follows separation.

Let w be the real wage, e effort required for workers who work, and q the probability of detection for a shirker. Unemployed workers receive per period utility, b, including the value of leisure time as well as unemployment benefits. Following Shapiro and Stiglitz (1984), we assume linear utility functions.

The standard no shirking condition yields:

$$V_E = \frac{w - e + sV^{us}}{r + s} \qquad (1)$$

$$w = rV^{us} + (r + s + q)e/q \qquad (2)$$

Where V_E is the expected present discounted value of utility of an employed worker, subject to the no-shirking constraint, V^{us} is the expected present discounted value of short-term unemployment.

The Bellman equations for short- and long-term unemployment respectively are:

$$V^{us} = aV^E + \frac{1-a}{1+r}\left(b + V^{ul}\right) \qquad (3)$$

$$V^{ul} = baV^E + \frac{1-ba}{1+r}\left(b + V^{ul}\right) \qquad (4)$$

Where V^{ul} is the expected present discounted value of long-term unemployment.

Solving (1), (2), (3) and (4) yields:

$$w = b + e + \frac{e}{q}\left[(r+s) + \frac{a(r+b)}{1-a}\right] \tag{5}$$

Following Manning (1991) we define unemployment as **the end of period** stock. This is both consistent with the way we have set up the Bellman equations and allows for the fact that a proportion of those flowing into unemployment in any period also flow out during that period, and are thus not captured in empirical stock measurements. Hence, flow equilibrium requires:

$$U^{ST} = (1-a)sN \tag{6}$$

$$U^{ST} = ba\left(U^{LT} + U^{ST}\right) \tag{7}$$

leading to:

$$a = \frac{1}{1 + bu/s(1-u)} \tag{8}$$

substituting (8) into (5) yields the wage-setting schedule:

$$w = b + e + \frac{e}{q}\left[r + s + \frac{s(1-u)(r+b)}{bu}\right] \tag{9}$$

which can easily be seen to be upward-sloping in wage-employment space. The model is closed by the labour demand schedule:

$$w = F'(N) \tag{10}$$

where *F()* is the aggregate production function. However, since we are assuming that this will be unaffected by policy, we need consider only equation (9). It is easy to see that policy will be more effective if it also increases labour demand.

Policy

We model policy simply as an increase in β. Note that from equation (8):

$$\frac{\partial(ba)}{\partial b} = a^2$$

so that an increase in relative outflow rate for the long-term unemployed also implies an increase in their absolute outflow rate.

We can obtain the marginal effect of policy by differentiating (9) with respect to *u* and β, holding *w* constant. However, it will be easier to identify the offsetting effects by differentiating (5) instead and substituting for *a* later, yielding:

$$\left.\frac{du}{db}\right|_{dw=0} = \left[-1\Big/\frac{\partial a}{\partial u}\right]\left[\frac{\partial a}{\partial b} + \frac{a(1-a)}{(r+b)}\right] \tag{11}$$

where:

$$\frac{\partial a}{\partial b} = \frac{-u/s(1-u)}{\left[1+bu/s(1-u)\right]^2} = \frac{-a(1-a)}{b} < 0 \tag{12}$$

$$\frac{\partial a}{\partial u} = \frac{-b/s(1-u)^2}{\left[1+bu/s(1-u)\right]^2} < 0 \tag{13}$$

From (11), we can see that there are two off-setting effects represented by the terms in the second bracket:

i) A competition effect, whereby increasing β reduces *a* since the short-term unemployed face greater competition for jobs. This increases the utility cost of unemployment, reducing wage pressure and lowering unemployment at given wages.

ii) A utility effect, whereby increasing β reduces the utility costs of long-term unemployment, pushing wage pressure up and increasing unemployment at any given wage level.

However, it is immediately obvious from (12) that the competition effect will dominate for any *r*>0. Because the utility gain to the long-term unemployed is discounted more heavily than the cost to the short-term unemployed from greater competition in the job market, the threat of unemployment becomes more severe. Hence a lower wage is needed to prevent shirking, which allows employment to rise.

Finally, substituting (8), (12) and (13) into (11) yields:

$$\left.\frac{du}{db}\right|_{dw=0} = \frac{-r(1-u)u}{b(r+b)} < 0 \quad \text{or } e_{ub} = \frac{-r(1-u)}{(r+b)} \qquad (14)$$

It follows that programmes targeted at the inflow into unemployment would have no effect, since as the length of a period tends to zero, β→1 and *r*→0, so that the effectiveness of policy will tend to zero.

It is also worth noting from (14) that $\frac{du}{db} < 0$ does not require that β<1 and hence negative duration dependence is not a pre-requisite for policy effectiveness, although it will increase the effectiveness of policy, since e_{ub} is decreasing in β.

Aggregate substitution

We have modelled wage subsidies as an incentive for employers to substitute long-term unemployed for short-term unemployed workers when hiring. Similarly, the predominance of the competition effect in (14) will lead to aggregate substitution as well as a net reduction of unemployment: short-term unemployment will rise, though not by as much as long-term unemployment falls.

We define the aggregate substitution effect under state dependence as $-\frac{du^{ST}}{db}\Big/\frac{du^{LT}}{db}$. Noting that the flow equilibrium condition (7) implies:

$$u^{ST} = bau \tag{15}$$

we can obtain:

$$-\frac{du^{ST}}{db}\Big/\frac{du^{LT}}{db} = ab\left[\frac{a(r+b)-r(1-u)}{a^2b(r+b)+r(1-u)(1-ab)}\right]<1 \text{ if } r>0 \tag{16}$$

3. UNION BARGAINING

Union bargaining models of wage formation have been popular in the literature on Active Labour Market Policy (*eg* Calmfors and Forslund, 1991; Calmfors and Lang, 1995). Such models share with the Shapiro-Stiglitz model[2] the presumption that unemployment acts as a discipline on wage setters, and hence counters upward wage pressure. Hence it is unsurprising that our results, which depend on the interaction of policy with the appropriately discounted utility of unemployment, carry over from the efficiency wage case.

Following conventional practice, we assume that the wage is set so as to maximise the Nash bargain:

$$w_{it} = \arg\max U_{it}^{c}\Pi_{it}^{1-c} \tag{17}$$

where U_{it} is the utility of the union at time t; Π_{it}, the firm's operating profit, and χ the relative bargaining strength of the union. Following Manning (1993), we assume a union utility function of the form:

$$U_{it} = N_{it}^{y}\left(V_{it} - V_{t}^{us}\right) \tag{18}$$

where N_{it} is the level of firm employment; ψ the union's preference for employment relative to wages; V_{it} the present discounted value of employment at the firm and V_t^{us} the present discounted value of short-term unemployment.

We can write the value functions as:

$$V_{it} = \frac{1}{1+r}\left[v(w_{it}) + s_{it}V_{t+1}^{us} + (1-s_{it})V_{it+1}\right] \tag{19}$$

$$V_t^{us} = a_t\overline{V} + \frac{1-a_t}{1+r}\left[v\left(b_t\right) + V_{t+1}^{ul}\right] \tag{20}$$

$$V_t^{ul} = ba_t\overline{V} + \frac{1-ba_t}{1+r}\left[v\left(b_t\right) + V_{t+1}^{ul}\right] \tag{21}$$

$$\overline{V}_t = \frac{1}{1+r}\left[v(\overline{w}_t) + \overline{s}_tV_{t+1}^{us} + \left(1-\overline{s}_t\right)\overline{V}_{t+1}\right] \tag{22}$$

where $V_t^{ul}, \overline{V}_t$ are the present discounted values of long-term unemployment and outside employment respectively; *v(.)* is the utility function of union members; b_t is the real value of unemployment benefits; s_{it} the probability of separation from the firm; and $\overline{w}_t, \overline{s}_t$ the wage and separation rate in outside employment.

If we assume that the wage is set for one period only, and that employment is set unilaterally by the firm, we can write the first order condition for the maximisation of (17) as:

$$w_{it} = m\left(V_{it} - V_t^{us}\right) \quad \text{where: } m = \frac{1}{v'(w_{it})}\left(ye_{Nw} + \tfrac{1-c}{c}e_{pw}\right) \tag{23}$$

where e_{Nw}, e_{pw} are the elasticities of employment and profits with respect to the wage. We will assume that μ is constant across time and independent of unemployment, at given wages.

If we solve equations (19) – (23) for a stationary solution, and impose the equilibrium conditions $w_i = \overline{w} = w$, and $s_i = \bar{s} = s$, we obtain:

$$w = \frac{\mu(1-\alpha)}{(r+\beta\alpha)+s(1-\alpha)}\left[v(w)-v(b)\right] \tag{24}$$

Differentiating (24) with respect to u and β, holding the wage constant, yields:

$$\left.\frac{du}{d\beta}\right|_{dw=0} = \left[-1\Big/\frac{\partial\alpha}{\partial u}\right]\left[\frac{\partial\alpha}{\partial\beta}+\frac{\alpha(1-\alpha)}{(r+\beta)}\right] \tag{25}$$

exactly as in the efficiency wage case. Since a is affected only by the flow equilibrium, and not by wage setting, we can see that the effect of policy is the same in the union bargaining case as in the efficiency wage model.

4. HETEROGENEITY

Our model of ALMP can be modified to examine heterogeneity as well as state dependence. The basic conclusion is the same, that policy is effective, provided it is targeted at the less able. Since, given heterogeneity, the less able make up an increasing proportion of the unemployed as duration increases, this implicitly targets the long-term unemployed.

Under heterogeneity, however, it is no longer necessary for policy to target the long-term unemployed directly. In the simplest case, policy is targeted on the inflow into unemployment. In Section 5 below, we modify this so that policy operates only after one period of unemployment, as in the state dependence case. Both models use Shapiro-Stiglitz wage-setting, but the results from Section 3 above suggest that equivalent results would be found in the union bargaining case.

We assume that there are two types of labour, with the least appointable having an outflow rate γ times that of the most able, where $0<\gamma<1$. This enables us to model policy as an increase in γ. However, this does not require that individual's type is observable: job search assistance could be offered to all the unemployed, but is likely to be most valuable to those who have the weakest job search skills and of little, if any, value to those most job ready. This is less likely to apply to a wage subsidy, however, and we model this below as assisting both high and low exit rate workers on the assumption that it is targeted on the long-term unemployed.

We also assume that 'appointability' is drawn randomly on entry into unemployment and is unemployment-spell-specific. This ensures that there is a single wage. It also avoids the implication of worker-specific appointability that those most likely to get hired are those most likely to shirk on the job.

Targeting the inflow

Suppose unemployed workers are high appointability with probability π, low appointability with probability $1-\pi$, where 'high' workers have exit rate a and 'low' workers exit rate γa such that $0<\gamma<1$. Equations (1) and (2) continue to define the no shirking criterion, whilst the remaining value functions are given by:

$$V_U = pV_U^h + (1-p)V_U^l \tag{26}$$

$$V_U^h = aV_E + \frac{1-a}{1+r}\left[b + V_U^h\right] \tag{27}$$

$$V_U^l = gaV_E + \frac{1-ga}{1+r}\left[b + V_U^l\right] \tag{28}$$

and hence:

$$w = b + e + \frac{e}{q}\left[(r+s) + a(1+r)\left(\frac{p + g\,(1-p)\,l}{(1-a)p + (1-ga)(1-p)\,l}\right)\right] \tag{29}$$

where $l = \left(\dfrac{r+a}{r+ga}\right)$

The stock of unemployed at duration *i* equals the inflow times the survival rate at duration *i*. We again define unemployment as the end of period stock, giving:

$$u^h = ps(1-u)\sum_1^{\infty}(1-a)^i \tag{30}$$

$$u^l = (1-p)s(1-u)\sum_1^{\infty}(1-ga)^i \tag{31}$$

which gives:

$$a = \frac{gp + (1-p)}{g\left[1 + u/s(1-u)\right]} \tag{32}$$

Policy

Holding *w, e, b, r* and *s* constant and differentiating (29) with respect to γ and *u* yields:

$$\left.\frac{du}{dg}\right|_{dw=0} = \left[-1\Big/\frac{\P a}{\P u}\right]\left[\frac{\P a}{\P g} + \frac{a(1-p)}{g\,(1-p) + p/l^2}\right] \tag{33}$$

where:

$$\frac{\partial a}{\partial g} = \frac{-(1-p)}{g^{2}\left[1+u/s(1-u)\right]} = \frac{-a(1-p)}{g\left[gp+(1-p)\right]} < 0 \qquad (34)$$

$$\frac{\partial a}{\partial u} = \frac{-a}{s(1-u)^{2}\left[1+u/s(1-u)\right]} < 0 \qquad (35)$$

Hence, from (33) we can again see that there are competing competition and utility effects, as in the state dependence model. From (34) it is clear that if r=0 the effects will exactly cancel out. Furthermore, $\frac{\partial l}{\partial r} < 0$ so that the utility effect is decreasing in r, whilst the competition effect is independent of r. Hence for any r>0 the competition effect will dominate, and policy will again be effective.

We also note that as $g \to 1, l \to 1/g$ and hence the competition and utility effects will again exactly cancel, regardless of r. Thus if there is no heterogeneity, policy targeted on the inflow into unemployment will be ineffective.

Finally substituting (34) and (35) into (33) gives:

$$\left.\frac{du}{dg}\right|_{dw=0} = \frac{-r(1-g)p(1-p)s(1-u)^{2}\left[1+gl\right]}{g^{2}a(r+ga)\left[p+g(1-p)l^{2}\right]} < 0 \qquad (36)$$

Aggregate substitution

Just as in the state dependence case, we can separate out the effects on high and low exit rate workers to yield an aggregate substitution effect, where aggregate substitution is now defined as $\frac{-du^{h}}{dg}\Big/\frac{du^{l}}{dg}$ where u^h, u^l are the unemployment rates of high and low exit rate workers respectively.

From (30), (31) and (32), we have:

$$u^h = \frac{ps(1-u)(1-a)}{a}$$

$$u^l = \frac{(1-p)s(1-u)(1-ga)}{ga}$$

from which we can obtain:

$$\frac{-du^h}{dg} \Big/ \frac{du^l}{dg} = \frac{1+zp[g+(1-p)s(1-g)]\,du/dg}{1-z(1-p)[1+ps(1-g)]\,du/dg} < 1 \text{ if } r>0 \text{ and } \gamma<1. \quad (37)$$

where: $z = \dfrac{gp + (1-p)}{p(1-p)[u+s(1-u)]}$

which gives the aggregate substitution effect.

5. HETEROGENEITY AND POLICY FOR THE LONG-TERM UNEMPLOYED

So far we have modelled policy under heterogeneity as targeting the inflow into unemployment, the simplest case. The effectiveness of policy in this case contrasts with Calmfors' and Lang's (1995) conclusion that 'targeting the long-term unemployed is crucial for the success of ALMP'. However, in practice policies are more likely to be targeted on the long-term unemployed in order to reduce deadweight. This would be particularly true of relatively expensive programmes such as wage subsidies, whereas providing job search assistance to all or part of the inflow might be considered fiscally viable. Moreover, unless type can be selected on, wage subsidies are likely to benefit both high and low appointability types, in which case the results from section II with $r \to 0$ would apply and policy would be ineffective.

We can easily modify the model to account for this. However, we need slightly different modelling strategies for job search assistance and wage subsidies. It is reasonable to suppose that job search assistance programmes will predominantly affect only those with poor job search strategies and consequently low exit probabilities. Even if highly appointable workers go on the programme, they are unlikely to gain much from it, since they are already pursuing effective job search strategies. In contrast, wage subsidies are likely to assist both high and low exit rate workers, although not necessarily equally.

Job search assistance

We suppose that high exit rate workers have exit rate a at all durations. Low exit rate workers have initial exit rate γa. After one period of unemployment, however, they are subject to policy and obtain exit rate $\beta_0\gamma a$, where β_0 is initially unity (in the absence of state dependence), but is increased by policy.

The wage equation now becomes:

$$w = b + e + \frac{e}{q}\left[(r+s) + a\left(\frac{p(1+r) + g(1-p)(r+b_0)\tilde{l}}{p(1-a) + (1-p)(1-ga)\tilde{l}}\right)\right] \tag{38}$$

where: $\tilde{l} = \left(\frac{r+a}{r + b_0 ga}\right)$

and flow equilibrium gives:

$$a = \frac{(1-p) + b_0 gp}{g\left[(1-p) + b_0 p + b_0 u/s(1-u)\right]} \tag{39}$$

Solving as before yields:

$$\left.\frac{du}{d\beta_0}\right|_{dw=0} = \left[-1\Big/\frac{\partial a}{\partial u}\right]\left[\frac{\partial a}{\partial \beta_0} + \frac{\gamma a(1-\gamma a)(1-p)}{\gamma(1-p)(r+\beta_0) + p(1+r)\big/\tilde{\lambda}^2}\right]$$

(40)

where:

$$\frac{\partial a}{\partial \beta_0} = \frac{-a(1-\gamma a)(1-p)}{\beta_0\left[(1-p) + \beta_0\gamma p\right]} \qquad (41)$$

so that we can again see that the competition effect dominates, provided $r>0$ and $\beta_0\gamma<1$.

Wage subsidies

Suppose instead that policy benefits all the long-term unemployed. It is unclear theoretically whether the gains would be greater or less for high exit rate workers than for low exit rate workers. Thus we define θ as the relative effect between high and low exit rate workers, subject only to the condition that $\theta>\gamma$, so that high exit rate workers always have higher exit rates that low exit rate types. Hence 'high' workers have initial exit rate a, and exit rate $\theta\beta_1 a$ after one period of unemployment, whilst 'low' workers have initial exit rate γa and $\beta_1\gamma a$ thereafter. β_1 is now the policy variable.

The wage equation now becomes:

$$w = b + e + \frac{e}{q}\left[(r+s) + a\left(\frac{p(r+\theta\beta_1) + \gamma(1-p)(r+\beta_1)\hat{\lambda}}{p(1-a) + (1-p)(1-\gamma a)\hat{\lambda}}\right)\right]$$

$$\text{where: } \hat{l} = \left(\frac{r + qb_1 a}{r + b_1 ga} \right) \tag{42}$$

and:

$$a = \frac{[(1-p) + gp]}{g[1 + b_1 u/s(1-u)]} \tag{43}$$

which leads to:

$$\left.\frac{du}{db_1}\right|_{dw=0} = \left[-1 \Big/ \frac{\partial a}{\partial u} \right] \left[\frac{\partial a}{\partial b_1} + \frac{a[qp(1-a) + g(1-p)(1-ga)\hat{l}^2]}{p(r+qb_1) + g(1-p)(r+b_1)\hat{l}^2} \right] \tag{44}$$

$$\frac{\partial a}{\partial b_1} = \frac{-a[gp(1-a) + q(1-p)(1-ga)]}{b_1[gp + q(1-p)]} \tag{45}$$

so that, once again, the competition and utility effects cancel out if r=0, and the competition effect dominates for any r>0, provided θ is not too large[3].

The optimal timing of interventions

From (14), (36), (40) and (44) we can see that, under each of our sets of assumptions, policy is increasingly effective as r increases. This suggests that maximum policy effectiveness can be achieved by targeting the very long-term unemployed. Against this, however, we need to consider the likely increased difficulty of improving outflow rates at longer durations. Furthermore, we can see from (36) and (40) that both the competition and utility effects will be larger when policy is targeted on the inflow, where a higher proportion of the unemployed are subject to it.

In practice, therefore, the optimal timing of interventions will be determined by the balance between offsetting factors:

i) Both greater discounting and a lower probability of remaining unemployed long enough to obtain the benefit from programmes will reduce the wage-increasing utility effect as the target duration increases. This will tend to make policy more effective at longer durations, for a given increase in relative outflow rates.

ii) To the extent that demoralisation and adaptation to a life on benefits set in (for psychological evidence of adaptation, see Warr and Jackson, 1987; Winefield and Tiggeman, 1989), the costs of achieving a given improvement in outflow rates will rise with duration. In addition, because fewer people will enter the programme, the increase in competition faced by the short-term unemployed will be lower.

6. ESTIMATES OF EFFECTIVENESS

Whilst it would be inappropriate to use such a stylised model to obtain detailed cost-benefit estimates of particular active labour market policies, equations (14), (36), (40) and (44) can yield illustrative estimates of what we might expect from active labour market policy at the aggregate level. Whilst insufficient to establish whether any given programme is worthwhile, this can at least move us from the claim that policy can reduce aggregate unemployment to an assessment of whether such a reduction is likely to be significant.

Table 1 gives some sample calculations of the elasticity of aggregate unemployment with respect to the relevant policy variable. The values of γ given roughly correspond to those for β, although an exact parallel is not possible, since outflow rates decline continuously with duration in the heterogeneity case, but only once in the state dependence case. All the calculations are based on an unemployment rate of 10% and a separation rate of 10%. The proportion of ‘high’ unemployed workers, π, is set at 0.75[4]. For the heterogeneity case, with policy targeted on the long-term unemployed, estimated elasticities are calculated around $\beta_0=1$ or $\beta_1=1$ and $\theta=1$ respectively. Varying any of these parameters does not substantively affect the results.

The subjective rate of time preference, *r* is set at 0.1. As we would expect, increasing *r* leads to much greater effects of policy.

The different elasticities are not directly comparable since the proportion of the unemployed stock subject to the policy, and the value of the policy parameter at which the elasticity is calculated, both vary. Even compensating for this, we would need to know the costs of policy options before cross-comparisons could be meaningfully made.

The general message from the values in Table 1, however, is that active labour market policy could lead to a reduction in unemployment that is neither negligible nor spectacular. Suppose we start from an unemployment rate of 10%, and with the outflow rate of the long-term unemployed half that of the short-term unemployed. At given wage levels, an Active Labour Market Policy that eliminated negative duration dependence[5] could reduce aggregate unemployment by around 1.5?2.0 percentage points. From the measures of aggregate substitution, we can see that the reduction in long-term unemployment would be approximately double the net effect so that long-term unemployment would be virtually eliminated if we assume the long-term unemployed make up about 40% of the unemployed stock (Nickell, 1987). The final effects would be smaller, the steeper is the labour demand curve.

7. CONCLUSION

We have presented a number of closely-related models of active labour market policy in a macroeconomic framework. These take the possibility of programme effectiveness at micro-level (for the participants) for granted, instead asking what the general equilibrium effects of such policies would be. We also ignore any possible effects on labour demand, partly because the subject has been thoroughly dealt with elsewhere (see for example Kaldor, 1936; Bishop and Haveman, 1979; Layard and Nickell, 1980) and partly because such effects appear to be quite small (OECD, 1993). Clearly, any outward shift in the labour demand schedule would reinforce our results.

Our principal innovation is to model ALMP as a transition rather than a state. We believe that this is the appropriate framework for modelling job search assistance and wage subsidy schemes. Our results suggest that policies that involve directly improving an unemployed person's chances of obtaining a regular job, rather than sending them on a scheme, are unambiguously effective provided they are targeted on those who are, or are likely to become, long-term unemployed. Where there is heterogeneity among the unemployed, this implies that policies targeted on the inflow into unemployment will be effective, provided that the policies largely help the less appointable.

The optimal timing of policy involves a trade-off between larger proportional effects at longer durations and greater difficulties in improving outflow rates. Unless the unemployed have an unusually high discount rate, it is probably optimal to target wage subsidies on those who have been unemployed for at least one year[6]. Job search assistance, however, would be disproportionately useful to those who would otherwise have low exit rates and could therefore be provided much sooner, particularly if it could be targeted on those likely to have low exit rates, such as the low skilled and those with previous experience of unemployment.

Finally, our estimates suggest that a well-designed active labour market policy could reduce equilibrium unemployment by perhaps two percentage points, with double the net effect on long-term unemployment. Although insufficient to return unemployment even to the levels of the 1970s, this would certainly be a significant step in the right direction.

ENDNOTES

1. The Australian Jobstart programme has a requirement that participants be kept on after the expiry of their subsidy. However, Byrne and Buchanan (1994) found that only a small number of employers were aware of this obligation.

2 . And more generally with the concept of a NAIRU.

3. In general, provided $rq(q-1) \leq a(q-g)[qb_1(1-g)+r(q-g)]$ this will always hold.

4. For any given π, u and s, the restriction that $a \leq 1$ implies a limit on the extent of negative duration dependence. From (32) we can see that a is decreasing in π as we would expect, and hence a relatively high value of π is needed to allow for higher values of duration dependence.

5. Korpi (1994) argues that active labour market policies eliminate negative duration dependence in Sweden.

6. If young unemployed people have a higher discount rate, it might be preferable to make wage subsidies available earlier for them.

TABLE 1

Estimates of policy effectiveness

		State Dependence			Heterogeneity		
β	γ	$\varepsilon_{u\beta}$	Substitution	$\varepsilon_{u\gamma}$	Substitution	$\varepsilon_{u\beta 0}$	$\varepsilon_{u\beta 1}$
1.0	1.0	-0.08	69%	0	100%	-0.02	-0.08
0.75	0.46	-0.11	63%	-0.12	76%	-0.13	-0.12
0.6	0.34	-0.13	57%	-0.18	68%	-0.19	-0.16
0.5	0.27	-0.15	51%	-0.23	62%	-0.23	-0.20
0.4	0.20	-0.18	44%	-0.28	55%	-0.28	-0.28

Assuming: r=0.1; s=0.1; u=0.1; π=0.75; $\beta_0=\beta_1=\theta=1$

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