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Engineering an incentive to search for work: A comparison groups approach ☆

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ABSTRACT

Social comparisons are important in the employment sphere. A "culture of unemployment" may evolve and prevail because it is optimal for an individual to remain unemployed when other unemployed individuals constitute his main reference group. We advance the idea that by making the receipt of unemployment benefits conditional on engagement in an incentive-enhancing activity (for example, work under state-sponsored employment schemes or participation in work-site-based training programs), a government can engineer a revision of the reference groups of an unemployed individual in order to induce him to seek work.

1. Introduction

Unemployment benefits are believed to contribute to the incidence and sustainability of unemployment by dampening the incentive to search for employment (Katz and Meyer, 1990; Scarpetta, 1996; Nickell, 1997; Blanchard and Wolfers, 2000). In this paper we highlight the importance of social externalities related to unemployment in the design of disbursement of unemployment benefits aimed at inducing people to seek jobs.

A large body of evidence from econometric studies, experimental economics, social psychology, and neuroscience (for example, Luttmer, 2005; Clark and Senik, 2010) indicates that humans routinely compare themselves with others who constitute their reference group. The evidence that the unemployed are highly spatially concentrated (Martin and Morrison, 2003; Wheeler, 2007) supports the notion that other unemployed people constitute their main reference group (Clark, 2003); physical nearness is a natural determinant of social proximity. Then, "a culture of unemployment" is likely to gain a foothold and lead to long-term unemployment. Statistics speak for themselves: according to the US Bureau of Labor Statistics, in September 2014 the long-term unemployed (jobless for 27 weeks or more) accounted for 36.7 percent of the unemployed.[1]

The disincentive effect of unemployment benefits arises from income that is a substitute for wages lowering the marginal gain from employment and consequently dampening the incentive to search for work. Here, this line of reasoning is taken further. Rather than focusing on the level and duration of benefits, we look at the procedure for disbursing them. We study the effectiveness of a particular policy tool (conditional benefits) in lowering unemployment by influencing social comparisons and endogenous group formation. Evidence regarding the

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[1] http://www.bls.gov/news.release/empsit.t12.htm.

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scarring effect of unemployment (for example, Arulampalam, 2001; Gregory and Jukes, 2001) indicates that the wages of workers who land a job after a long spell of unemployment (the "newly employed") are significantly lower than the wages of workers who have been continuously employed (the "old" employees). Thus, the unemployed who successfully venture to enter the job market and who become newly employed feel the brunt of intensified comparisons with the "old" employees who earn more than they do. When unemployment benefits are disbursed unconditionally, participation in the job market is thereby penalized, whereas remaining unemployed partially shields individuals from unfavorable income comparisons. This "protection" weakens the incentive of the unemployed to seek work.

However, when receipt of the benefits is made conditional on engagement in an incentive-enhancing activity such as work under state-sponsored work schemes or participation in a work-site-based training program, every individual on benefits, regardless of his job search activity, feels the brunt of intensified unfavorable income comparisons as he compares himself more with the employed people. The policy of conditional benefits transforms a disincentive into an incentive: if open market employment pays better than work under state-sponsored work schemes, the unemployed who are made to perform such work and thereby to compare themselves more with the employed will become more inclined to seek work. Thus, we outline a revised benefits scheme which makes unemployed people more likely to compare themselves with the employed. In short, under conditional benefits the relative deprivation cost of finding work which arises from comparisons that the newly employed make with the "old" employees is already sunk and, thus, the marginal reward from landing a job is higher than when the unemployment benefits are disbursed unconditionally.

2. Model and results

We distinguish between two reference groups of an unemployed individual: "old" employees (OE), each of whom earns wage w^{oe}, and fellow unemployed (FU). In turn, the group FU consists of unemployed individuals who happened to find a job, becoming "newly employed" (NE), and earning a wage w^{ne}, and of unemployed individuals who did not find a job, remain unemployed (U), and receive unemployment benefit w^u. We assume that $w^u < w^{ne} < w^{oe}$ and that wages follow a "narrowing wage gap," namely that $w^{ne} - w^u > w^{oe} - w^{ne}$.[2]

When the individual's earnings fall behind the earnings of others in his reference groups, the individual feels *relatively deprived*. Here, for an individual earning w^i and with average earnings in one of his reference groups G being w^g, the relative deprivation, henceforth RD, is $RD_{i-G} = \max\{w^g - w^i, 0\} = (w^g - w^i)^+$.[3,4]

"Endogenous reference group formation" is reflected in a change of the weights accorded to the reference groups. When an individual is unemployed, he attaches a lower weight to comparisons with the "old" employees, denoted by $\alpha_{u-OE} \in (0,1)$, than the corresponding weight when he becomes "newly employed," denoted by $\alpha_{ne-OE} \in (0,1)$, that is, $\alpha_{ne-OE} > \alpha_{u-OE}$. In addition, we let $\alpha_{FU} \in (0,1)$ denote the weight that the individual attaches to the RD arising from a comparison with fellow unemployed.

Let $e_i \geq 0$ denote the effort to search for work exerted by an unemployed individual i; $p(e_i)$ the probability of finding a job; and $h(e_i)$ the search cost. We assume that $p(\cdot)$ is strictly concave; $h(\cdot)$ is strictly convex; both are increasing and twice differentiable; $p(0) = h(0) = 0$; and $\lim_{e_i \to \infty} p(e_i) = 1$ (and, thus, also $\lim_{e_i \to \infty} p'(e_i) = 0$).

When unemployment benefits are doled out unconditionally (Scenario 1 below) searching for work is discouraged because RD will be heightened if successful, whereas when the benefits are conditional (Scenario 2 below) exposure to RD arises even if the individual does not search for work. This shift in perspective decreases the RD penalty of getting a job and thereby encourages the search for gainful work.

Scenario 1: Unconditional benefits

The expected utility of an unemployed individual is

$$\begin{aligned} U(e_i) = {} & p(e_i)\big(w^{ne} - \alpha_{FU} RD_{ne-FU} - \alpha_{ne-OE} RD_{ne-OE}\big) \\ & + \big[1 - p(e_i)\big]\big(w^u - \alpha_{FU} RD_{u-FU} - \alpha_{u-OE} RD_{u-OE}\big) \\ & - h(e_i), \end{aligned} \tag{1}$$

namely, the individual becomes employed with probability $p(e_i)$, in which case he derives utility from earning wage w^{ne}, is exposed to RD from comparisons with fellow unemployed (RD_{ne-FU}), and is exposed to RD from comparison with "old" employees (RD_{ne-OE}). With probability $1 - p(e_i)$ the individual remains unemployed, gets unemployed benefit w^u, and is exposed to RD from comparisons with fellow unemployed and with "old" employees, namely to RD_{u-FU} and RD_{u-OE}, respectively.

We consider a partial equilibrium setting, namely we assume that the group of unemployed individuals is not large enough to change the demand for labor and, thus, $p(e_i)$ does not change with the number of fellow unemployed who find a job. When choosing his search effort, the individual has a belief that a fraction $\bar{p} \in [0,1]$ of his fellow unemployed will find a job and earn w^{ne}. Therefore, the average earnings within the group FU are $\bar{p} w^{ne} + (1 - \bar{p}) w^u$. Hence, $RD_{ne-FU} = (\bar{p} w^{ne} + (1 - \bar{p}) w^u - w^{ne})^+ = 0$ and $RD_{u-FU} = (\bar{p} w^{ne} + (1 - \bar{p}) w^u - w^u)^+ = \bar{p}(w^{ne} - w^u)$. Also, $RD_{ne-OE} = w^{oe} - w^{ne}$ and $RD_{u-OE} = w^{oe} - w^u$. Thus, (1) simplifies to

$$\begin{aligned} U(e_i) = {} & p(e_i)\big[w^{ne} - \alpha_{ne-OE}\big(w^{oe} - w^{ne}\big)\big] \\ & + \big[1 - p(e_i)\big]\big[w^u - \alpha_{FU}\bar{p}\big(w^{ne} - w^u\big) \\ & - \alpha_{u-OE}\big(w^{oe} - w^u\big)\big] - h(e_i). \end{aligned}$$

From the properties of the p and h functions it follows that U is concave:

$$\begin{aligned} U''(e_i) = {} & p''(e_i)\big[(1 + \alpha_{FU}\bar{p})\big(w^{ne} - w^u\big) - \alpha_{ne-OE}\big(w^{oe} - w^{ne}\big) \\ & + \alpha_{u-OE}\big(w^{oe} - w^u\big)\big] - h''(e_i) < 0. \end{aligned}$$

An unemployed individual will choose to exert search effort $e_i > 0$ only if $\lim_{e_i \to 0^+} U'(e_i) > 0$, namely, only if

$$\begin{aligned} & p_0\big[(1 + \alpha_{FU}\bar{p})\big(w^{ne} - w^u\big) - \alpha_{ne-OE}\big(w^{oe} - w^{ne}\big) \\ & + \alpha_{u-OE}\big(w^{oe} - w^u\big)\big] - h_0 > 0, \end{aligned} \tag{2}$$

where $p_0 = \lim_{e_i \to 0^+} p'(e_i)$ and $h_0 = \lim_{e_i \to 0^+} h'(e_i)$.

[2] The magnitude of the wage penalty inflicted by a period of unemployment was estimated to lie between 5% and 20% (Arulampalam, 2001; Gregory and Jukes, 2001) for British workers, and between 5% and 15% for American workers (Hamermesh, 1989). With a gross unemployment benefit of less than 40% of preceding gross earnings in the majority of OECD countries (cf. OECD Statistics on Benefits and Wages; http://www.oecd.org/els/benefitsandwagesstatistics.htm) our "narrowing wage gap" assumption, namely, that the difference between the wage of an "old" employee and the wage of a newly employed individual is smaller than the difference between the wage of a newly employed individual and the unemployment benefit, is plausible.

[3] Stark (2013) provides a brief foray into relative deprivation.

[4] Resorting to more refined measures of RD does not change our qualitative results.

Under (2), the optimal effort level of an individual, e_i^*, is given by

$$p'(e_i^*)\big[(1+\alpha_{FU}\bar{p})(w^{ne}-w^u)-\alpha_{ne-OE}(w^{oe}-w^{ne}) +\alpha_{u-OE}(w^{oe}-w^u)\big]-h'(e_i^*)=0. \quad (3)$$

Claim 1. *Under unconditional benefits, the weight of the RD towards "old" employees to be experienced upon finding a job, α_{ne-OE}, acts as a disincentive to search for work.*

Proof. We first note that the higher the α_{ne-OE}, the less likely it is that (2) is satisfied. When (2) is satisfied, by applying the implicit function theorem to e_i^* in (3) we get that

$$\frac{de_i^*}{d\alpha_{ne-OE}} = -\frac{p'(e_i^*)(w^{oe}-w^{ne})}{h''(e_i^*)-p''(e_i^*)[(1+\alpha_{FU}\bar{p})(w^{ne}-w^u)-\alpha_{ne-OE}(w^{oe}-w^{ne})+\alpha_{u-OE}(w^{oe}-w^u)]} < 0. \quad \square$$

We can view e_i^* as the individual's strategy under some expectations about the effort choices of fellow unemployed. Thus, we search for strategies constituting symmetric Nash equilibria.

The optimal effort of the individual is a function of his belief as to how many other unemployed individuals will find work, namely $e_i^* = e_i^*(\bar{p})$. Under rational expectations regarding others' search effort, and with homogeneity of the group of the unemployed, each individual conjectures that his fellow unemployed will choose the same level of effort e, and expects that a fraction $\bar{p} = p(e)$ of them will succeed in finding a job.

A symmetric Nash equilibrium, e^*, is thus given by

$$e_i^*\big(p(e^*)\big) = e^*. \quad (4)$$

We first note that for $\bar{p} = p(0) = 0$, (2) is equivalent to

$$p_0\big[(w^{ne}-w^u)-\alpha_{ne-OE}(w^{oe}-w^{ne}) +\alpha_{u-OE}(w^{oe}-w^u)\big]-h_0>0. \quad (5)$$

Thus, if (5) is not satisfied, then $e^*=0$ constitutes a symmetric Nash equilibrium. The following claim formulates the sufficient condition for the existence of positive symmetric Nash equilibria.

Claim 2. *If an unemployed individual chooses a positive level of search effort under the belief that no other unemployed individual is searching for work ($\bar{p}=0$), that is, if (5) holds, then there exists at least one symmetric Nash equilibrium such that $e^*>0$.*

Proof. If (5) holds, then because $p(0)=0$ we get that

$$e_i^*\big(p(0)\big) = e_i^*(0) > 0. \quad (6)$$

Applying the implicit function theorem to (3) we get

$$\frac{de_i^*}{d\bar{p}} = \frac{p'(e_i^*)\alpha_{FU}(w^{ne}-w^u)}{h''(e_i^*)-p''(e_i^*)[(1+\alpha_{FU}\bar{p})(w^{ne}-w^u)-\alpha_{ne-OE}(w^{oe}-w^{ne})+\alpha_{u-OE}(w^{oe}-w^u)]} > 0. \quad (7)$$

Thus, from the chain rule we get that

$$\frac{de_i^*}{de} = p'(e)\frac{de_i^*(p(e))}{d\bar{p}},$$

and then,

$$\lim_{e\to\infty}\frac{de_i^*}{de} = \lim_{e\to\infty}\frac{p'(e)p'(e_i^*)\alpha_{FU}(w^{ne}-w^u)}{h''(e_i^*)-p''(e_i^*)\{[1+\alpha_{FU}p(e)](w^{ne}-w^u)-\alpha_{ne-OE}(w^{oe}-w^{ne})+\alpha_{u-OE}(w^{oe}-w^u)\}} = 0, \quad (8)$$

recalling that $\lim_{e\to\infty} p(e)=1$ and $\lim_{e\to\infty} p'(e)=0$.

Therefore, for the continuous function

$$F(e) \equiv e_i^*\big(p(e)\big) - e,$$

upon combining (6), (7), and (8), we get that $F(0)>0$ and that $\lim_{e\to\infty} F(e)<0$ and, thus, there exists at least one point $e^*>0$ such that $F(e^*)=0$, that is, $e_i^*(p(e^*))=e^*$. $\square$

Scenario 2: Conditional benefits

Suppose that the government makes the receipt of unemployment benefits conditional on the unemployed individuals performing some work. If this policy effectively mingles the unemployed with the employed, then the comparison horizon of the unemployed is revised. In our model, this intensification translates into replacing the weight α_{u-OE} with a parameter $\alpha \in (\alpha_{u-OE}, \alpha_{ne-OE}]$ (a perfect mixing of the unemployed with the "old" employees obtains when $\alpha = \alpha_{ne-OE}$). Additionally, we assume that not complying with the government conditional-benefit program, and thereby not obtaining unemployment benefit, is not a viable "exit option."

Using a tilde to indicate a value or a function under conditional benefits, the utility of an unemployed individual is now

$$\begin{aligned}\tilde{U}(e_i) &= p(e_i)\big(w^{ne}-\alpha_{FU}RD_{ne-FU}-\alpha_{ne-OE}RD_{ne-OE}\big) \\ &\quad +\big[1-p(e_i)\big]\big(w^u-\alpha_{FU}RD_{u-FU}-\alpha RD_{u-OE}\big)-h(e_i) \\ &= p(e_i)\big[w^{ne}-\alpha_{ne-OE}\big(w^{oe}-w^{ne}\big)\big] \\ &\quad +\big[1-p(e_i)\big]\big[w^u-\alpha_{FU}\bar{p}\big(w^{ne}-w^u\big)-\alpha\big(w^{oe}-w^u\big)\big] \\ &\quad -h(e_i).\end{aligned}$$

The following claim delineates the effect of the policy on the search effort exerted by an unemployed individual.

Claim 3. *If an individual exerted a positive search effort under unconditional benefits ($e_i^*>0$), then the introduction of conditional benefits makes him increase his optimal search effort $\tilde{e}_i^* > e_i^*$, and this increase is higher the more effective is the government mixing policy, that is, the closer is α to α_{ne-OE}.*

Proof. Because $e_i^*>0$, condition (2) must have held. An equivalent condition to (2) for the case of conditional benefits is

$$p_0\big[(1+\alpha_{FU}\bar{p})\big(w^{ne}-w^u\big)-\alpha_{ne-OE}\big(w^{oe}-w^{ne}\big) +\alpha\big(w^{oe}-w^u\big)\big]-h_0>0. \quad (9)$$

Because $\alpha>\alpha_{u-OE}$, (9) is satisfied when (2) is satisfied, then surely $\tilde{e}_i^*>0$, and the level of $\tilde{e}_i^*$ is given by

$$p'\big(\tilde{e}_i^*\big)\big[(1+\alpha_{FU}\bar{p})\big(w^{ne}-w^u\big)-\alpha_{ne-OE}\big(w^{oe}-w^{ne}\big) +\alpha\big(w^{oe}-w^u\big)\big]-h'\big(\tilde{e}_i^*\big)=0. \quad (10)$$

Applying the implicit function theorem to (10), we get

$$\frac{d\tilde{e}_i^*}{d\alpha} = \frac{p'(\tilde{e}_i^*)(w^{oe}-w^u)}{h''(\tilde{e}_i^*)-p''(\tilde{e}_i^*)[(1+\alpha_{FU}\bar{p})(w^{ne}-w^u)-\alpha_{ne-OE}(w^{oe}-w^{ne})+\alpha(w^{oe}-w^u)]} > 0. \quad (11)$$

Thus, treating optimal effort as a function of α, $\tilde{e}_i^*(\alpha)$, we get that $\tilde{e}_i^*(\alpha) > \tilde{e}_i^*(\alpha_{u-OE}) = e_i^*$ for any $\alpha>\alpha_{u-OE}$. Obviously, also $\tilde{e}_i^*(\alpha_1) < \tilde{e}_i^*(\alpha_2)$ for any $\alpha_1<\alpha_2$, $\alpha_1,\alpha_2 \in (\alpha_{u-OE}, \alpha_{ne-OE}]$. $\square$

The following claim ascertains the impact of the policy on the search effort that constitutes the symmetric Nash equilibrium.

Claim 4.

a) *Under the assumption that there exists a positive symmetric Nash equilibrium under unconditional benefits $e^* > 0$, there exists also a positive symmetric Nash equilibrium under conditional benefits, $\tilde{e}^* > 0$.*

b) *If the sensitivity of an individual to the changes in the perceived probability of the others finding a job, $\frac{d\tilde{e}_i^*}{d\tilde{p}}$, is small in relation to the marginal gain in the probability from increasing search effort in the Nash equilibrium, $p'(\tilde{e}^*)$, specifically, if $\frac{d\tilde{e}_i^*}{d\tilde{p}} p'(\tilde{e}^*) < 1$, then the institution of conditional benefits shifts the equilibrium upwards, namely, $\tilde{e}^* > e^*$.*

Proof. a) The symmetric Nash equilibrium in the case of conditional benefits satisfies a condition equivalent to (4), that is,

$$\tilde{e}_i^*\big(p(\tilde{e}^*)\big) = \tilde{e}^*. \tag{12}$$

The existence of a positive symmetric Nash equilibrium in the unconditional benefits regime entails its existence in the conditional benefits regime (cf. condition (5) and properties (7) and (8), which, if satisfied for α_{u-OE}, hold also for $\alpha \in (\alpha_{u-OE}, \alpha_{ne-OE}]$ in place of α_{u-OE}).

b) Treating $\tilde{e}_i^*$ as function of the parameters $\tilde{p}$ and α, and treating $\tilde{e}^*$ as function of α, we rewrite (12) as

$$\tilde{e}_i^*\big(p(\tilde{e}^*(\alpha)), \alpha\big) - \tilde{e}^*(\alpha) = 0. \tag{13}$$

Applying the implicit function theorem to condition (13), we obtain

$$\frac{d\tilde{e}^*}{d\alpha} = \frac{\frac{d\tilde{e}_i^*}{d\alpha}}{1 - \frac{d\tilde{e}_i^*}{d\tilde{p}} p'(\tilde{e}^*)} > 0,$$

which holds under the assumptions of part b) of the claim and the observation that $\frac{\partial \tilde{e}_i^*(\tilde{p},\alpha)}{\partial \alpha} = \frac{d\tilde{e}_i^*}{d\alpha} > 0$, where $\frac{d\tilde{e}_i^*}{d\alpha}$ is as given in (11). Because $e^* = \tilde{e}^*(\alpha_{u-OE})$, we get that $e^* < \tilde{e}^*(\alpha)$ for any $\alpha > \alpha_{u-OE}$. □

The overall effect of the conditional policy is thus an increase in the search effort of *a single* unemployed individual, and a likely increase in the intensity of search of *the group* of the unemployed individuals.

3. Concluding remarks

In this paper we advance a theoretical hypothesis regarding the design of eligibility criteria for unemployment benefits aimed at manipulating unemployed individuals' comparison groups and thereby their incentive to search for work on the open market.

One way to affect the comparison group of the unemployed is to dilute the cluster effect by moving some of the unemployed to areas populated by the employed. Andersson et al. (2014) report that in the US, proposals have recently been made to relocate residents of high unemployment neighborhoods to job-abundant neighborhoods, for example with a housing voucher program. But it is likely that such a policy will be costly. An example of a more modest means of encouraging reference group substitution is as follows. Suppose that a specific task can be performed by teams of four or five workers. There are several teams already at work; some consist of four workers, others of five. There are four unemployed individuals who are to be brought into the sphere of the "old" employees. Each of these four should be attached to an existing four-worker team, rather than the four forming a new team by themselves. It is worth adding that already before Andersson et al. (2014), several authors (Patacchini and Zenou, 2005; Gobillon and Selod, 2007; Kneebone, 2014) argued that a mismatch in geographical space is a cause of prolonged unemployment; if the unemployed could only be cheaply transported to where the jobs are, unemployment would take a beating. Here we address a "mismatch" in social space rather than to a mismatch in geographical space.

A concern could be raised that our reasoning fails to allow for the possibility that the unemployed who are in receipt of unemployment benefits are stressed because they feel they are a burden on their society and have no role to play in its affairs. Such unease could, in itself, constitute an incentive to get to work. But then, our proposed policy will have a perspective that works against the policy: being assigned to work could be interpreted by the unemployed as being given a role in society which, in turn, could weaken their incentive to seek work on the open market. However, on further reflection, this argument seems to break down for two reasons. First, had the "idle" unemployed been worried about receiving benefits for no work and about having no role to play in society, they could have volunteered to carry out socially valuable work. It is when and because they do not, that our proposed policy matters. Second, there is considerable evidence that unemployment creates adverse psychological effects that impede or depress rather than energize or boost the drive to seek work (Winkelmann and Winkelmann, 1998, and references cited therein). But then, the case for our proposed policy becomes even stronger: once given work to do, the unemployed regain self-esteem, feel that they do contribute to their society and, overall, are on a sounder platform to initiate a drive to obtain work on the open market. Nonetheless, studying the hearts and minds as well as the frustrations and aspirations of the unemployed constitutes a fertile ground for follow-up research.

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