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**Tightness and Stigma Effects: Evidence from Wage Subsidies**

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## 1. Introduction

Blanchard and Diamond (1994) argue that employers, who receive multiple applications for a vacancy, prefer short-term to long-term unemployed. That is, an employer ranks applicants and long-term unemployed end up in the tail of the ranking.

Most papers that attempt to test the stigma hypothesis are extensions of hazard rate studies that analyse the escape rate from unemployment. Hazard rate studies are commonly used to distinguish heterogeneity from duration dependence effects – see Devine and Kiefer (1991). Heckman and Borjas (1980), Lynch (1985, 1989), and Van den Berg and Van Ours (1994) include the length of completed spells of unemployment in conventional hazard rate specifications to differentiate between employer related duration dependence arguments (stigma) and job seeker related arguments (like loss of search morale or skill obsolescence). Though, with limited success. Omori (1997) includes reasons for job loss and labour market conditions at the time of job loss as explanatory variables of escape rates and finds overwhelming evidence in favour of stigma effects.

All these studies have in common that they study the outcome of job search to draw conclusions about employer search behaviour. This paper uses firm level data to study stigma effects and therefore studies employer behaviour. We study changes in firm recruitment behaviour for progressively more complex jobs for different labour market conditions.

Two reasons spring to mind as to why firms will alleviate stigma towards long-term unemployed: a quantity and a quality related argument. Both arguments are related to the length of the recruitment procedure which involves costs of a non-productive vacancy. We argue below that they have a different impact on deadweight loss, however.

In tight labour market conditions the supply of short-term unemployed is limited which implies a lengthy period between two applicants. This in turn, extends the recruitment procedure and hence hiring costs, which induces firms to stop disregarding long-term unemployed. This is a quantity related argument. Mitchell and Bill (2005) find, using Australian data, that long-term unemployed find employment when the labour market becomes sufficiently tight.

The average productivity of the pool of long-term unemployed increases in slack labour market conditions, because short-term unemployed fail to find a job and enter the pool of long-term unemployed. This increased quality makes recruitment from this group a viable alternative to other jobseekers as the likelihood of a long-term unemployed meeting the recruitment criteria is higher, which reduces the length of the recruitment procedure. This is a quality related argument. Or to use Omori's wording, long-term unemployment serves as less of a stigma if the labour market conditions under which the unemployment spell started (and developed) are less favourable (i.e. a period of high unemployment rates). This paper explores whether the second argument also dominates stigma effects.

To analyse firm recruitment behaviour we use a survey dataset on firms that participated in one of two British New Deal programmes: either the New Deal for Long-Term Unemployed (NDLTU) or the New Deal for Young People (NDYP). In the latter programme the employer has to spend the subsidy on training the long-term

unemployed, the former programme does not have this requirement. The paper is organised as follows. Section 2 describes the techniques and data sets we use to test firm behaviour in tight conditions. Section 3 focuses on the empirical results. Section 4 concludes.

## **2. Data and Hypotheses**

To test the willingness of employers to recruit from the long-term unemployed we apply a technique introduced in Welters (2005) studying deadweight loss in wage subsidies. Deadweight loss in wage subsidy programmes appears to be substantial – see Friedlander et al. (1997). This loss measures the share of employers that would have hired the subsidised worker in the absence of the subsidy – see Calmfors (1994). If this loss is substantial, the subsidy hardly improves the labour market position of the targeted group. The share of deadweight loss is not only indicative of the inefficiency of a wage subsidy programme, it is also indicative of the recruitment strategy of a firm in absence of the subsidy. That is, we can use deadweight loss incidence as an indication of the firm's willingness to recruit from the non-subsidised long-term unemployed. The quantity argument suggests a negative relationship between the unemployment rate and deadweight loss, whereas the quality argument suggests a positive relationship.

Evaluation studies on wage subsidy programmes try to measure deadweight loss and this paper exploits a survey conducted by the National Centre for Social Research (NCSR) to explore the effectiveness of the British NDLTU and the NDYP – see Hales et al. (2000). The NDLTU and NDYP are part of the New Deal program which was launched in 1997 under the Blair government to fight long-term and youth unemployment respectively. The NCSR used the data to explore the attitudes, beliefs and practices among employers involved in the NDLTU / NDYP and also tried to understand why firms want to participate in such schemes. Participating employers were interviewed in 1999; about 6 months after the subsidised employee had started working for the employer. The response rate of the survey is 84%. In total 3,029 employers were interviewed for their involvement in the NDLTU / NDYP. Together these employers provided subsidised employment for 4,886 long-term unemployed.

### **2.1 Deadweight loss incidence**

The respondents to the survey are employers who participated to either the NDLTU or the NDYP or both in the period 1998-1999. The survey contains information which allows constructing a deadweight loss estimate, which we use in our analysis. To qualify for deadweight loss incidence, the vacancy – now filled with a subsidised employee – should 1) have existed in the absence of the subsidy opportunity, and 2) have been filled with a jobseeker whose appointment entitles the firm to the subsidy. The survey contains questions related to both conditions. Table 1 gives an indication of the magnitude of deadweight loss incidence and similarity between the wage and the training subsidy: six out of ten firms who obtained a wage or a training subsidy notify that 1) the timing of the job opening is unrelated to the subsidy opportunity, and 2) they would have appointed the same applicant in the absence of the subsidy.

Table 1 Deadweight loss construction, NDLTU / NDYP

Would the same applicant have been recruited without the subsidy?	Would the vacancy have existed in absence of the subsidy?				
	non-additional	very likely	fairly likely	fairly unlikely	very unlikely
	applicant type				
Would the same applicant have been recruited without the subsidy?	same applicant	59.1% / 59.3% (2)	10.2% / 11.8% (1)	1.8% / 2.5% (1)	2.0% / 3.2% (1)
	different applicant	5.9% / 7.0% (0)	1.2% / 1.5% (0)	6.7% / 5.2% (0)	13.1% / 9.0% (0)

The ordering of the deadweight loss variable used in the regression analysis in Section 3 is in brackets

## 2.2 Types of jobs

To test the quality aspect of our hypotheses, we need to distinguish between simple and complex jobs. That is, if employers perceive the quality of the pool of long-term unemployed increases in slack labour market conditions, one would expect this to reflect in employer's willingness to recruit from the long-term unemployed for progressively more complex jobs. Therefore we need a progressive scale of job complexity. To that end we use the standard occupational classification (SOC2000), which not only classifies as to type of jobs, but also as to skills involved in job performance. The latter attribute makes the SOC adequate to serve as the progressive scale of job complexity employed in our analysis. Occupational level differences between jobs provided in the NDYP and NDLTU are modest. Therefore, we aggregate both schemes in our analysis. Though, we will use dummy variables throughout our analysis to control for remaining differences between the two schemes. These differences mainly arise from differences in the target group. In the scope of the NDLTU, firms have to employ unemployed who are over 25 and out of employment for at least two years. In the scope of the NDYP, firms have to employ unemployed who are under 25 and out of employment for at least six months. Table I in the appendix presents descriptive statistics of the participating firms and the jobs they offer.

## 2.3 Firms' tightness perception

To test the firm's difficulties to fill vacancies we require variables that indicate labour market tightness. The questionnaire contains a question which addresses this issue. Employers is asked whether they experienced any difficulties in filling previous vacancies, that is, job openings the firm had in the twelve months spell prior to the vacancy they filled with a subsidised long-term unemployed. Unfortunately, we cannot use this variable in our analysis, since not all employers have had recent recruitment experiences, as Table I in the appendix shows. As a matter of fact, 12% of employers does not have recent recruitment experience and therefore cannot be classified accordingly. Subsequently, we need to find other indicators of labour market tightness for which we have data for the whole sample.

To this end we consider both the unemployment rate and the share of long-term unemployed in the unemployment pool, as indicators of labour market circumstances. The drawback of such measures is that it is hard to define the firm's relevant labour

market. That is, what regional boundaries does a firm face in terms of recruiting? To address this issue we employ so-called Travel-To-Work-Areas (TTWAs). A TTWA is an approximation to a self-contained labour market based on commuting to work patterns. That is, at least 70% of those who reside in a TTWA also work there and at least 70% of those who work in a TTWA also reside there. A TTWA has a minimum population of 20,000 residents. There are 308 TTWAs in Great Britain. The fact that TTWAs are isolated areas is of importance to our analysis. The isolation allows us to use the local unemployment rate and the local share of long-term unemployed in total unemployment in the region the firm resides in as its relevant labour market.

The dataset contains only limited information about the quality and quantity of the labour supply. To incorporate both spatial as well as temporal variation in the quality and quantity of the labour supply in our analysis, we retrieve information from Nomis – official labour market statistics. The temporal variation stems from the fact that not all subsidised jobs started at the same day. Obtaining a subsidy was possible between January 1998 and December 1999. To take changing labour market conditions within this two year spell into account we use monthly data. Nomis provides detailed regional data on unemployment rates, disaggregated to TTWA. We distinguish 308 relatively isolated labour markets in Great Britain for which we have data on the monthly local unemployment rate and the monthly local share of long-term unemployment in total unemployment. We add this information to the original data set.

We expect both measures to covariate with the difficulties firms face to fill their (previous) vacancies. To confirm our expectations, we run a logit regression with a binary dependent variable measuring the experienced previous difficulties to fill a job (yes/no) and the local unemployment rate and local share of long-term unemployed in total unemployment at the time of hiring the long-term unemployed as independent variables. We also control for variables related to the firm's search strategy, the type of job and the type of firm. The first column of Table 2 shows the results. We find that both the local unemployment rate and the local share of long-term unemployed in total unemployment have the predicted effect on firms perceiving recruitment difficulties. A higher unemployment rate and a lower share of long-term unemployed in total unemployment ease the difficulties firms experience in filling their vacancies. Furthermore we observe that there are no differences between participating firms in the NDYP and the NDLTU. We observe that the search strategy in terms of recruitment channels employed matters, but we should be careful interpreting these results since the causality of effects is unclear – see Russo et al. (2000). Next, firms face more difficulties filling fulltime jobs than part-time jobs, suggesting job seekers at the bottom of the labour market prefer searching for part-time jobs. We also see that large firms have less recruitment difficulties than small or medium sized firms, probably because large firms attract more applicants than small firms – see Barron et al. (1985).

## 2.4 Control variables

Next to labour market conditions, there are also other factors that influence the firm's willingness to recruit from the long-term unemployed, like the firm's intensive and extensive search costs – see Welters and Muysken (2006a). Intensive search costs refer to the expenditures spent per assessed applicant; extensive search costs refer to costs involved in assessing more candidates (predominantly costs of not filling a

vacancy, as assessing more candidates prolongs the recruitment period, especially when the arrival rate of applicants is low).

If intensive search costs are low, firms are more willing to recruit from a segment of the labour market (i.e. the long-term unemployed), in which chances of finding a qualified applicant are relatively low. Low intensive search costs imply that the cost of making a hiring mistake (i.e. the necessity of a new recruitment procedure) are low. The empirical employer search literature shows that large firms (enjoying economies of scale to recruitment) experience low intensive search costs.

If extensive search costs are high, firms are more willing to recruit from the long-term unemployed. That is, if not filling the vacancy leads to substantial costs, firms want to fill the vacancy quickly and subsequently do not disregard long-term unemployed. Obviously, one factor determining the length (and hence the costs) of the recruitment procedure is labour market tightness, for reasons mentioned previously. However, also other factors influence the periodical production loss of a vacancy, like the significance of the vacancy in terms of hours worked or in terms of supervisory tasks included in the job. If the vacancy is only a part-time job and it does not contain supervisory tasks, the production loss of not filling it, will be limited.

Finally we control for sector, the occupational level of the job, and the recruitment channel(s) firms use. Table I in the appendix gives the descriptive statistics of our independent variables.

## 2.5 Testable hypothesis

At the heart of our hypothesis is that easing labour market conditions lead to an increase in the share of long-term unemployment in total unemployment. That is, the size of the unemployment pool is not only affected by an influx of new (obviously short-term) unemployed but also by a lack of outflow of unemployed, whose unemployment duration lengthens, tending the share of long-term unemployed in total unemployment to increase. To verify our expectation, we correlate the local unemployment rate and the local share of long-term unemployed in total unemployment. Figure 1 shows the correlation between both variables.

Figure 1 Correlation between the local share of LTU in total unemployment and the local unemployment rate

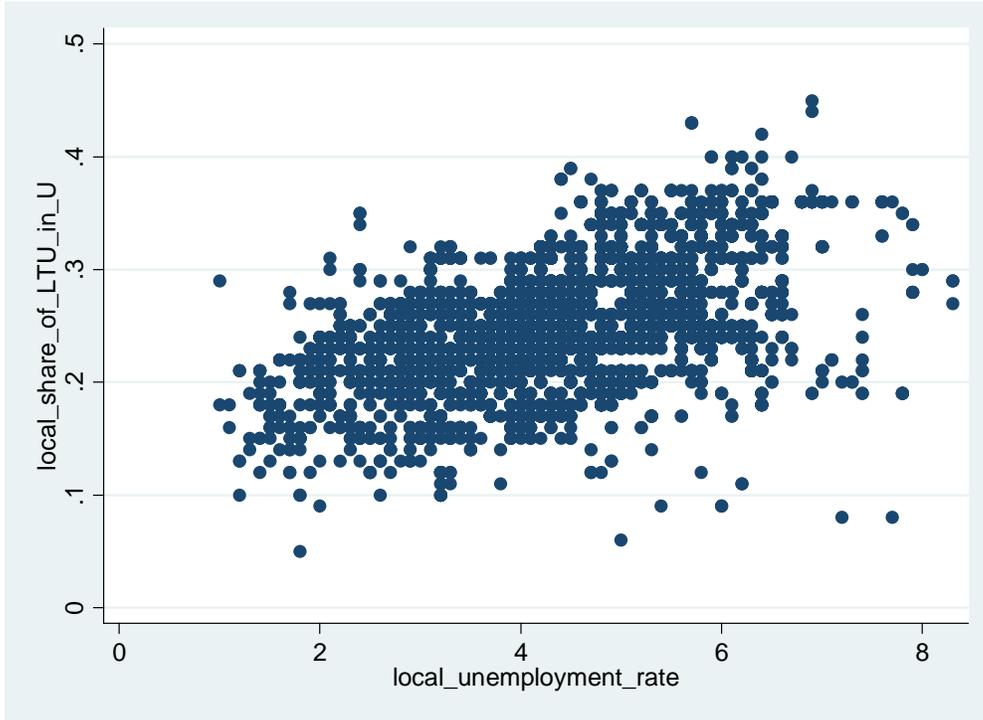


Figure 1 clearly suggests positive correlation between the local share of long-term unemployment in total unemployment and the local unemployment rate (the correlation coefficient is 0.5). We take this as evidence that the pool of long-term unemployed is ‘freshened up’ with previously short-term unemployed in slack labour market conditions. This process subsequently raises the productivity level of the average long-term unemployed in the pool of long-term unemployed. Our hypothesis therefore is: “Employers are more inclined to recruit from the long-term unemployed to fill progressively more complex jobs under slack labour market conditions, because the quality of that specific group improves under such conditions.”

To test this hypothesis we interact the unemployment rate to job complexity. If firms indeed perceive the quality of the pool of long-term unemployed to go up in slack labour market conditions, they should hire long-term unemployed for progressively more complex jobs, when the labour market eases.

### 3. Empirical results

The ordered structure of the dependent variable suggests we adopt ordered logit models in our analysis – cf. McCullagh (1980). The ordered logit model is:

$$DWL_i^* = X_i\beta + \varepsilon_i \tag{1}$$

$$DWL_i = \begin{cases} 0 & \text{if } DWL_i^* \leq \mu_0 \\ 1 & \text{if } \mu_0 < DWL_i^* \leq \mu_1 \\ 2 & \text{if } DWL_i^* > \mu_1 \end{cases}$$

where,  $DWL_i^*$  is an unobserved continuous variable representing the likelihood that a firm,  $i$ , would have hired the subsidised employee in absence of the subsidy;  $DWL_i$  is the observed ordered estimate of DWL incidence described in Table 1 for firm  $i$ ;  $X_i$  is a vector of explanatory variables described in Table I of the appendix for firm  $i$ ;  $\beta$  is a vector of coefficients;  $\varepsilon_i$  is a standard normal random error term and  $\mu_i$  are threshold parameters as mentioned in Table 1. Since it is unclear how coefficients in the ordered logit model should be interpreted, we present marginal effects in Table 2 – see Greene (2003). Most independent variables are dummy variables. The marginal effects of the dummy variables are evaluated at the discrete change (0, 1). The presented marginal effects sum to zero, which follows from the requirement that the probabilities add to unity.

We also explore the potential role of ‘socially desired answering’ in our type of research. That is, firms might under report deadweight loss incidence as it is an unwanted side effect of wage subsidy schemes, which potentially troubles our results. To explore this notion we include two explanatory variables in vector  $X_i$ , which are – like the deadweight loss estimate – vulnerable to socially desired answering. The two (dummy) variables relate to the time and effort the firm spent on creating an environment which maximises the success rate of its subsidised employee. The socially desired answer would be to spend as much time and effort into this process as possible, though there is no requirement to do so. The variables indicate whether the firm (1) had contact with the jobcentre during the subsidised stay, and (2) had appointed a mentor who guided the subsidised employee. We conduct a t-test of the marginal effects of both dummy variables,  $\beta_{\text{jobcentre}}$ , and  $\beta_{\text{mentor}}$ , where we accept socially desired answering if  $\beta_{\text{jobcentre}} < 0$ , and / or  $\beta_{\text{mentor}} < 0$ .

Table 2 presents the regression results. A first interesting result is that the local unemployment rate is related positively to deadweight loss incidence, i.e. to the firm’s willingness to recruit from the long-term unemployed. That is, a slack labour market intensifies deadweight loss incidence, which is in line with earlier findings – see Welters and Muysken (2006b) (though in Welters and Muysken (2006b), we were not able to define regional labour markets as well as we do in this paper). This is a first indication that changes in the composition of the pool of long-term unemployed matter to the firm’s recruitment behaviour.

Not surprisingly, the incidence of deadweight loss is higher when firms fill low or medium occupational level jobs than when filling high occupational level jobs. However, this tendency appears to be affected by the stance of the labour market as our hypothesis predicts. The interaction variable gives the predicted effects: firms are more willing to recruit from the long-term unemployed for progressively more complex jobs when the labour market is slack.

We find no support for the findings of Mitchell and Bill (2005), who suggest that stigma evaporates when the labour market is sufficiently tight. A potential reason is that the British labour market was not sufficiently tight in 1998 and 1999 to enforce employers to drop their refusal to hire from long-term unemployed. Figure 1 shows that local unemployment rates below 2% have been rare in this time window. Moreover, regions that did experience unemployment rates below 2% had low rates of long-term unemployed in total unemployment, suggesting that firms operating in tight local labour markets still had a significant pool of short-term unemployed to draw from.

Table 2 Clustered logit regression of perceived recruitment difficulties on labour market conditions / clustered ordinal logit regression of deadweight loss incidence in subsidy schemes (marginal effects)

Dependent variables Independent variables	Difficulties to fill the vacancy	Deadweight Loss Incidence		
		None	Potential	Sure
Constant	- 0.86*** (0.34)			
<b>Labour Market Circumstances:</b>				
Local unemployment rate	- 0.15*** (0.04)	- 0.04** (0.02)	- 0.01** (0.01)	0.05** (0.02)
Local share of LTU in total unemployment	2.91*** (0.93)	0.01 (0.13)	0.00 (0.05)	- 0.02 (0.17)
Unemployment rate X low occ. job		0.04** (0.02)	0.02** (0.01)	- 0.06** (0.03)
Unemployment rate X medium occ. job		0.03 (0.02)	0.01 (0.01)	- 0.04 (0.03)
Unemployment rate X high occ. job		reference	reference	reference
<b>Search Strategy:</b>				
NDYP subsidy	0.02 (0.09)	0.01 (0.01)	0.00 (0.00)	- 0.01 (0.02)
NDLTU subsidy	reference	reference	reference	reference
Ads only	- 0.31 (0.20)	0.03 (0.03)	0.01 (0.01)	- 0.05 (0.04)
Ads and LEO	0.42*** (0.10)	- 0.02 (0.02)	- 0.01 (0.01)	0.03 (0.02)
LEO only	reference	reference	reference	reference
Neither channel	- 1.48*** (0.21)	0.11*** (0.02)	0.03*** (0.00)	- 0.14*** (0.03)
<b>Type of Job:</b>				
Low occupational job	0.13 (0.18)	- 0.26*** (0.07)	- 0.09*** (0.02)	0.37*** (0.10)
Medium occupational job	0.11 (0.17)	- 0.17** (0.08)	- 0.06** (0.02)	0.24** (0.11)

High occupational job	reference	reference	reference	reference
Part-time job	reference	reference	reference	reference
Fulltime job	0.17* (0.09)	-0.07*** (0.01)	-0.02*** (0.01)	0.09*** (0.02)
Supervision	-0.04 (0.13)	-0.05** (0.02)	-0.02** (0.01)	0.07** (0.03)
No supervision	reference	reference	reference	reference
<b>Type of Firm:</b>				
Small firm	0.52*** (0.14)	0.03* (0.02)	0.01* (0.01)	-0.05* (0.03)
Medium sized firm	0.35*** (0.13)	-0.03 (0.02)	-0.01 (0.01)	0.04 (0.03)
Large firm	reference	reference	reference	reference
Agriculture, forestry and fishing	-0.06 (0.26)	-0.07*** (0.03)	-0.03** (0.02)	0.10** (0.04)
Food, beverages and tobacco	0.13 (0.29)	-0.08** (0.04)	-0.04* (0.02)	0.13** (0.06)
Textile, wearing apparel and leather	-0.31 (0.34)	-0.10*** (0.03)	-0.05** (0.02)	0.15*** (0.05)
Wood, pulp and publishing	-0.03 (0.28)	-0.07** (0.03)	-0.03* (0.02)	0.09* (0.05)
Chemicals and rubber	-0.08 (0.25)	-0.08*** (0.03)	-0.04** (0.02)	0.12*** (0.04)
Metal products and machinery	-0.05 (0.22)	-0.07*** (0.03)	-0.03** (0.01)	0.10** (0.04)
Electrical machinery and motor vehicles	0.00 (0.24)	0.00 (0.03)	0.00 (0.01)	-0.01 (0.05)
Construction and utilities	reference	reference	reference	reference
Retail, wholesale and hotels	-0.14 (0.15)	-0.02 (0.02)	-0.01 (0.01)	0.03 (0.03)
Transport and communications	-0.28 (0.23)	-0.07** (0.03)	-0.03** (0.02)	0.10** (0.04)
Banking and finance, and property	-0.24 (0.19)	-0.04* (0.02)	-0.02* (0.01)	0.06* (0.03)
Public sector	-0.62*** (0.17)	-0.01 (0.02)	-0.00 (0.01)	0.01 (0.03)
<b>Socially Desired Answering:</b>				
Contact with Jobcentre		-0.02	-0.01	0.03

No		(0.01) reference	(0.01) reference	(0.02) reference
Appointment of Mentor		0.01 (0.01)	0.00 (0.00)	- 0.01 (0.02)
No		reference	reference	reference
N	4,067	4,249	4,249	4,249

Standard errors in parentheses, \*10% significance, \*\* 5% significance, \*\*\* 1% significance

The control variables give the predicted effects. Firms offering fulltime jobs and jobs including supervisory tasks experience higher extensive search costs and are subsequently more willing to recruit from the long-term unemployed. Large firms cause more deadweight loss, hinting at lower intensive search costs. Finally, there is no evidence suggesting that ‘socially desired answering’ is troubling our results. Both variables related to ‘socially desired answering’ are insignificantly different from zero in our analysis.

#### 4. Conclusions

In this paper we have used the incidence of deadweight loss in wage subsidy schemes to infer employer search behaviour, under different labour market circumstances. To determine the relevant labour market, we employed TTWAs, which give an economically meaningful demarcation of a local labour market. Our proposition is that employers would be willing to lower stigma barriers for long-term unemployed when the pool of long-term unemployed becomes more heterogeneous and of higher quality. This quality upgrading occurs in slack labour market conditions when short-term unemployed cannot find a job and subsequently enter the long-term unemployment pool.

To test our proposition we used data on firms participating in two wage subsidy schemes: the New Deal for Young People and the New Deal for Long-Term Unemployed. We use deadweight loss incidence as an indicator of the firm’s willingness to recruit from the long-term unemployed. We find that firms indeed recruit from the long-term unemployed for progressively more complex jobs when the labour market is slack compared to a tight labour market. This suggests that firms are aware of the changing state of the pool of long-term unemployed and adapt their recruitment policies accordingly.

We fail to find confirmation for Mitchell and Bill (2005)’s findings that firms recruit from the long-term unemployed when the labour market is sufficiently tight. A potentially reason is that the British labour market was not sufficiently tight in the period under investigation.

From a policy perspective, we conclude that weakening stigma effects in slack labour market conditions counteract the declining reemployment probabilities of long-term unemployed in such conditions. Any policy (e.g. training) targeted at upgrading skills of long-term unemployed will not only augment the reemployment probability of the ‘treated’ long-term unemployed, but will also change the composition of the pool of long-term unemployed. This composition effect will induce firms to readdress their stigma policy towards long-term unemployed.

## References

- Barron, J., Bishop, J. and Dunkelberg, W. (1985) 'Employer Size: The Interviewing and Hiring of New Employees', *The Review of Economics and Statistics*, 67, 43-52.
- Blanchard, O. and Diamond, P. (1994) 'Ranking, Unemployment Duration, and Wages', *Review of Economic Studies*, 61, 417-434.
- Calmfors, L. (1994) 'Active Labour Market Policy and Unemployment – A Framework for the Analysis of Crucial Design Features', *OECD Economic Studies*, 22, OECD, Paris.
- Devine, T. and Kiefer, N. (1991) '*Empirical Labour Economics*', Oxford University Press, Oxford.
- Friedlander, D., Greenberg, D. and Robins, P. (1997) 'Evaluating Government Training Programs for the Economically Disadvantaged', *Journal of Economic Literature*, 35, 1809-1855.
- Greene, W. (2002) '*Econometric Analysis*', New York, Prentice Hall.
- Hales, J., Collins, D., Hasluck, C. and Woodland, S. (2000) '*New Deals for Young People and Long-Term Unemployed*', Unemployment Service, Sheffield.
- Heckman, J. and Borjas, G. (1980) 'Does Unemployment Cause Future Unemployment? Definitions, Questions and Answers from a Continuous Time Model of Heterogeneity and State Dependence', *Economica*, 47, 247-283.
- Lynch, L. (1985) 'State Dependency in Youth Unemployment', *Journal of Econometrics*, 28, 71-84.
- Lynch, L. (1989) 'The Youth Labour Market in the Eighties: Determinants of Re-Employment Probabilities for Young Men and Women', *Review of Economics and Statistics*, 71, 37-45.
- Mitchell, W. and Bill, A. (2005) 'A spatial econometric analysis of the irreversibility of long term unemployment in Australia', *CofFEE Working Paper 05-05*, University of Newcastle, Australia.
- Omori, Y. (1997) 'Stigma Effects of Nonemployment', *Economic Inquiry*, 35, 394-416.
- Russo, G., Rietveld, P., Nijkamp, P. and Gorter, C. (2000) 'Recruitment channel use and applicant arrival: An empirical analysis', *Empirical Economics*, 25, 673-697.
- Van den Berg, G. and Van Ours, J. (1994) 'Unemployment Dynamics and Duration Dependence in France, The Netherlands and the United Kingdom', *The Economic Journal*, 423, 432-443.
- Welters, R. (2005) *Efficiency of Employment Subsidies and Firms' Recruitment Strategies*. Maastricht, PrintPartners Ipskamp.
- Welters, R. and Muysken, J. (2006a) 'Recruiting long-term unemployed: lessons from wage subsidies', *CofFEE Working Paper 06-04*, University of Newcastle, Australia.
- Welters, R. and Muysken, J. (2006b) 'Employer Search and Employment Subsidies', *Applied Economics*, 38, 1435-1448.

## Appendix

Table I Descriptive statistics

Variables	Description	Mean (SE)
<b>Labour Market Circumstances:</b>		
Unemployment rate	Unemployment rate in TTWA	4.52 (0.02)
LTU	Share of long term unemployed (claimants for over 12 months) in total unemployment	0.26 (0.00)
<b>Difficulties to fill a recent vacancy</b>		
No vacancy	1= if the firm had no vacancy prior to the one filled by the subsidised employee	0.12
Vacancy; difficulties	no 1= if the firm had no difficulties filling the vacancy prior to the one filled by the subsidised employee	0.52
Vacancy; difficulties	1= if the firm had difficulties filling the vacancy prior to the one filled by the subsidised employee	0.36
<b>Type of Subsidy</b>		
NDYP	1=firm obtained a subsidy in the scope of the New Deal for Young People	0.68
NDYP	0=firm obtained a subsidy in the scope of the New Deal for Long-Term Unemployed	0.32
<b>Recruitment channel</b>		
Ads only	1= if firm only uses the advertisement channel	0.05
Ads and LEO	1= if firm uses both the advertisement channel and the labour exchange office	0.44
LEO only	1= if firm only uses the labour exchange office	0.40
None of both	1= if firm uses none of both channels	0.12
<b>Occupational level of the Job</b>		
High occupational level	1= if required occupation is 'managers and senior officials', 'professional occupations' or 'associate professionals and technical occupations'	0.07
Medium occupational level	1= if required occupation is 'administrative and secretarial occupations', 'skilled trades occupations' and 'personal service occupations'	0.52
Low occupational level	1= if required occupation is 'sales and customer service occupations', 'process, plant and machine operatives' and 'elementary occupations'	0.41
<b>Hours Worked</b>		
Part-time job	1= if required hours worked for the vacancy are 39 per week or less	0.59
Fulltime job	1= if required hours worked for the vacancy are 40 or more	0.41
<b>Supervision</b>		
Yes	1= if the job requires supervisory tasks	0.08
<b>Firm Size</b>		
Small	1=if a firm has 10 or less employees	0.50
Medium	1=if a firm has more than 10 but less than 51 employees	0.31
Large	1=if a firm has more than 50 employees	0.17
<b>Sector</b>		

Agriculture, forestry and fishing	1= if firm sector is 'Agriculture, forestry and fishing'	0.04
Food, tobacco and beverages	1= if firm sector is 'Food, tobacco and beverages'	0.03
Textile, wearing apparel and leather	1= if firm sector is 'Textile, wearing apparel and leather'	0.02
Wood, pulp and publishing	1= if firm sector is 'Wood, pulp and publishing'	0.03
Chemicals and rubber	1= if firm sector is 'Chemicals and rubber'	0.04
Metal products and machinery	1= if firm sector is 'Metal products and machinery'	0.06
Electrical machinery and motor vehicles	1= if firm sector is 'Electrical machinery and motor vehicles'	0.05
Construction and utilities	1= if firm sector is 'Construction and utilities'	0.14
Retail, wholesale and hotels	1= if firm sector is 'Retail, wholesale and hotels'	0.23
Transport and communication	1= if firm sector is 'Transport and communication'	0.05
Banking and finance, and property	1= if firm sector is 'Banking and finance, and property'	0.11
Public sector	1= if firm sector is 'Public sector'	0.20
<b>Job Centre</b>		
Yes	1= if employer had had contact with job centre about the subsidised employee	0.41
<b>Mentor</b>		
Yes	1= if employer appointed a mentor for the subsidised employee	0.69

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