Quantitative Economics for the Evaluation of the European Policy

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Lindley, J. et al. (2015), **A non-parametric evaluation of the Want2Work active labour market policy**

- Active labour market policies are popular tools used to help get unemployed people back into work.

- They are measures to improve the situation, in terms of employment and wages, of the unemployed, and of disadvantaged populations.

- In particular, they include: public employment services, labour market training, youth employment and training measures, subsidized employment, employment programs for the disabled, job rotation and job sharing, and direct job creation.

Introduction

- It is a common problem that interventions of this type are often established without an equivalent control group on which to base an evaluation of the program effectiveness.

- The Want2Work scheme is an active labour market policy that was introduced by the Welsh Assembly Government in order to improve the chances of individuals currently out of work re-entering the labour market.

- The Want2Work pilot scheme ran from September 2004 until March 2008 in particular areas of Wales.

- The primary aim of the scheme is to improve the re-employment chances of the participants

Introduction

- Want2Work was intended for Incapacity Benefits (IB) recipients.

- IB is benefit for people who are unable to work due to health problems.

- Thus, many of the key characteristics of the scheme were concerned with the health status of participants.

- The scheme was voluntary and advertisements were placed in public places such as doctors surgeries.

- The key features of the program include a combination of measures directed to improve the information of participants as well as to provide financial incentives.

- **Aim of the paper**: all additional services, over and above standard assistance to those out of work, led to an increase in the likelihood that participants obtained a job?

Problems

Two issues:

- A control group was not established as part of the original evaluation protocol;

- the participation to the program is voluntary.

$$\Downarrow$$

- Authors use **propensity score matchin**g techniques to derive a control group of non-participants with similar observed characteristics to those who participate in the program.

- Then, they compare the employment probabilities of each group.

  N.B.: Propensity score matching does not impose any particular functional form on the estimated relationships.

The data

- They cannot observe participants in the non-participation state at the same point in time as they are participating.

- Data on non-participants must be used to estimate the counterfactual.

- Therefore, there must be good information available on both the treatment and control groups (participants and non-participants).

The data

- The database of information on Want2Work participants was collected by the Welsh Assembly Government.

- Any changes in status were also monitored and recorded.

- Who joined Want2Work between January 2005 and December 2007 is included $\Longrightarrow$ approximately **6,400 individuals** in the sample.

- **Detailed information on background characteristics:** age, gender, ethnicity, whether a single parent or not, highest qualification, type of welfare benefit being received when first registered with Want2Work, whether suffering from an illness or disability and if so what type, and **time spent out of work**.

The data

- **Time spent out of work** is a useful control variable: it is a proxy for unobserved employability characteristics.

- The **counterfactual data** used for the control group are drawn from the *Quarterly Labour Force Survey* (QLFS) for Great Britain.

- The QLFS has a wealth of information on employment outcomes and job characteristics, as well as all of the individual level characteristics that are observed for the Want2Work participants.

The data

- Want2Work data cover the period 2005 to 2007 $\implies$ QLFS data for the same period as far as possible.

- Nine quarterly data sets for this period were used: March-May 2005, June-August 2005, and so on through to March-May 2007.

- All Want2Work participants were, by definition, initially out of employment $\implies$ the QLFS sample was similarly restricted: excluding full time students and those who had taken early retirement.

- The control group was restricted to all those who responded to the survey for the full waves.

- The unemployment rate by travel-to-work area was therefore included amongst the list of conditioning variables.

- The resulting sample consisted of **8,994 men and women aged 16-65**. Of these, 3,427 reported that they wanted a job and were looking for a job.

The methodology

These data on the treatment and the control groups were used to estimate the effect of Want2Work:

$$ATET = E(Y_t|D = 1) - E(Y_c|D = 0) \tag{1}$$

It is assumed that the outcome for the control group provides a good estimate of the counterfactual for the treatment group.

Remind crucial assumption:

- **Conditional independence assumption**: $(Y_0; Y_1) \perp D|X$.
  Conditional on observed variables, X, the outcome is independent of treatment status.

The methodology

The propensity score, $e(x)$, is defined as the probability of an individual appearing in the treatment sample conditional on their observed characteristics:

$$e(x) = PrD = 1|X = x$$

The propensity score can be estimated with a binary choice model such as a probit (or logit) equation.

Remind that:

- conditional on the propensity score, outcomes will be independent of treatment status: $(Y_0; Y_1) \perp D|e(x)$

Matching method

Two matching methods are performed:

- **Nearest neighbour matching**, and
- **Kernel matching**

 - Kernel matching uses a weighted average of all of the observations in the control group to provide the match, with larger weights attached to observations with a closer propensity score to the treatment group individual being considered.

 - The weights are inversely proportional to the distance between the scores.

A brief description of Kernel matching

Kernel matching estimator

$$ATET = \frac{1}{N^T}\{\sum_{j \in T} Y_i^T - \sum_{j \in C} w_{ij} Y_j^C\}$$

where w_{ij} are defined as:

$$w_{ij} = \frac{K(\frac{p_i - p_j}{h})}{\sum_{j \in C} K(\frac{p_i - p_j}{h})} \tag{2}$$

where K is the kernel density function and h is the chosen bandwidth.

Matching method

- The true propensity score is unknown and has to be estimated in the first stage of the procedure,
- The computation of the standard errors on the treatment effect, estimated in the second stage, needs to take this prior estimation into account.
- The usual approach is to bootstrap the standard errors.
- In particular, the procedure involves repeatedly calculating the treatment effect with random samples of the available data, to verify the degree of uncertainty attached to the result.

Why to use PSM?

- It does not impose any functional form on the relationship

- The technique identifies those observations in the treatment group for which there is no common support.

Results

Key indicator: individuals move into employment?

- Two indicators:
    - First indicator takes the value of one if individuals, in either the treatment or control group, moved into work at any point during the period in which they were observed.
    - A second indicator of labour market outcomes, for those who find a job, is the wage that they earn.

- Both full-time and part-time workers are considered.

Results: raw data on labour market outcomes

Table 1

Labour market outcomes for the treatment and control group.

a) Employment incidence (percent)

	Percentage that got a job	N
Want2Work	29.8%	6424
QLFS	18.7%	8994
QLFS seeking work	31.9%	3427

b) Annual earnings (percent in each pay band)

Gross annual pay	Want2Work participants	QLFS
<£10,000	54.7%*	61.8%
£10,000–14,999	35.4%*	16.7%
£15,000–19,999	7.7%	8.4%
£20,000–29,999	1.7%*	7.3%
£30,000 +	0.5%*	5.8%
Mean	£9508†	£11,614
N	1901	838

Note: * denotes different from the QLFS at the 5% level. † estimated by an interval regression of the log of the wage band limits against a constant. QLFS is the GB Quarterly Labour Force Survey.

Propensity Score Matching Estimates of the Impact of Want2Work

Check the balancing property of PSM procedure.

- The matched sample will be balanced if there are no significant differences in the means of any characteristics between the treatment and control groups.

- They drop from the sample 2,415 observations that does not show tha common support.

- There remain some statistically significant differences in the characteristics between the two groups after the matching process.

Results: Propensity Score Matching Estimates of the Impact of Want2Work

Table 2 ✓

Propensity score estimates of W2W participation effect on probability of moving into work.

	Full sample		
	Propensity score (one to one)	Propensity score (kernel)	N
Any job	0.075** (0.018)	0.083** (0.015)	9299
Permanent job	0.109** (0.017)	0.104** (0.016)	9207
Full-time job	0.079** (0.016)	0.082** (0.010)	9299
	On Want2Work scheme < 15 months		
	Propensity score (one to one)	Propensity score (Kernel)	N
Any job[†]	0.065** (0.019)	0.073** (0.016)	9299
Permanent job	0.100** (0.017)	0.095** (0.015)	9207
Full-time job	0.074** (0.014)	0.077** (0.009)	9299

IB recipients only

Propensity Score Matching Estimates of the Impact of Want2Work

- Those who participated in Want2Work are 8 percentage points more likely to move into employment than similar job-seekers from the QLFS control group.

- This effect is both statistically and economically significant.

- Given that the average likelihood of moving into work in the sample is only around 30 percent, this impact of the Want2Work scheme is considerable.

- Two indicators of job quality that are available in both the Want2Work database and the QLFS: **whether or not the job acquired is full-time** and **whether or not the job acquired is permanent, or temporary and time-limited** in some way.

PSM Estimates of the Impact of Want2Work

- Larger Want2Work effect on the probability of obtaining a permanent job than obtaining any job.

- Want2Work participants being 10-11 percentage points more likely to acquire a permanent job than QLFS job-seekers.

- When the analysis focuses on full-time jobs only, the results are very similar to those for any jobs, with Want2Work participants being 7-8 percentage points more likely to move into full-time work than job-seekers in the QLFS

PSM Estimates of the Impact of Want2Work

- The impact of Want2Work on the employment probability is very similar to that estimated in the first panel.

The analyses in the third and fourth panels of Table 2 repeat the analyses of the first two panels, but restrict the sample to those on IB only.

- As expected, if Want2Work is successful in helping people into employment, it will be most successful for this specifically-targeted group.

- The first row shows that Want2Work participants are 14-15 percentage points more likely to move into employment than those are in the control group.

PSM Estimates of the Impact of Want2Work

Table 3

Propensity score estimates of W2W participation effect on earnings.

	Propensity score (one2one)	Propensity score (Kernel)	N
Full sample	− 0.026	− 0.003	2578
	(0.051)	(0.037)	
IB only	− 0.043	− 0.033	1134
	(0.144)	(0.085)	

Notes: matching variables are those listed in Table A2.

PSM Estimates of the Impact of Want2Work

- Estimates are provided for the full sample, and for IB claimants only.

- None of the four estimated coefficients approach statistical significance.

- Although three of the four are negative, which is suggestive of Want2Work participants accepting lower paid jobs, the evidence is in no way conclusive.

Concluding Remarks

- The evidence produced is convincing, and supportive for Want2Work.

- The Want2Work participants consistently come out as being more likely to move into employment, compared to individuals in the control group.

- The size of the programme effect varies according to the specification being considered, but is always statistically significant.

Methodological note

- This paper shows how evaluations of labour market policies can be undertaken, even when policy-makers have not collected data on a control group of non-participants,

- Data from national surveys such as Labour Force Surveys can be used to obtain a sample of individuals in non-policy areas, who can then be matched to programme participants using propensity score matching techniques, to ensure the employment probabilities of similar individuals are being compared.

- Such non-parametric techniques have additional advantages that they do not impose functional form, and identify any individual for whom there is a lack of common support.