



Employment promotion measures and the quality of the job match for persons with disabilities *

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Abstract

We evaluate the influence that employment promotion measures and labour market intermediation services addressed to disabled individuals have on the latter's quality of the job match through the use of matching analysis techniques. Our focus is placed on two aspects of quality: the type of contract held (either permanent or temporary) and whether or not the individual is searching for another job. We find that those measures do not improve the quality of the job match. Implications for labour market policy are discussed.

Key words: Disability, job matching, employment promotion, evaluation, matching analysis, permanent contract, job-to-job search.

JEL classification: J480, J40, I120.

1. Introduction

The objective of this article consists of analysing the effects of policies designed to promote the employment of people with disabilities on the quality of their job match. In particular, we focus on employment promotion measures and labour market intermediation services addressed to this population. It is widely known that disabled individuals undergo a situation of wage discrimination and negative prejudices, and that their participation rates in the labour market have remained lower than those of non-disabled individuals —the degree of which depends on the type of disability under consideration. Some previous research supporting these statements can be found, for instance, in Baldwin and Johnson (1995), Loprest

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et al. (1995) or Kidd *et al.* (2000). In many countries, several policies have been implemented to countervail their disadvantaged position in the labour market. There exist two wide groups of policies addressed to disabled individuals: on the one hand, income transfer programmes; on the other hand, employment promotion measures. The former have already been the subject of several studies (Bound and Burkhauser, 1999). However, the use of employment promotion measures has been much scarcely analysed in the literature (see Corden and Thornton, 2002, for a review of evaluations in different countries).

Our study constitutes a novelty in the current literature, given that (up to our knowledge) there is no previous research on the relationship between employment promotion measures and the quality of the job match for persons with disabilities. Its interest also lies on the fact that in order to ascertain the job quality of disabled individuals, focusing only on their employment or re-employment probability which follows from employment promotion measures would offer a partial analysis. This would be the case in so far as a precarious entry into the labour market were regarded as successful when compared to unemployment, since it must be taken into account that workers with a poor quality match might be dismissed in the first place whenever a crisis begins. Therefore, not only the entry or re-entry into employment is a subject of concern when analyzing disabled people's labour careers. For this reason, we will not consider the effects of employment promotion measures on individuals' job finding success, but on their job quality success. Two proxies for the quality of the job match are used. On the one hand, the type of contract held —either open-ended or temporary; this variable constitutes an «objective» (or «demand-side») measure to the extent that it is sensible to assume that open-ended contracts are associated to better matching quality than temporary contracts. On the other hand, a «subjective» (or «supply-side») measure is given by whether or not disabled workers are searching for another job: if workers are searching for another job, it is reasonable to believe that the quality of their job match can be improved and that they may regard the one of their actual employment as insufficient.

We use data from a Spanish survey launched in the year 1999. This survey is especially designed to obtain a representative picture of people with disabilities in Spain, since it includes information on employment in a similar way as other labour force surveys do. The information included takes into account whether or not the current job has been obtained through an employment promotion programme, and whether or not the individual has used labour market intermediation services specifically designed for people with disabilities. As will be explained later (see Section 3), an important feature in this survey is that disability is not defined as «disability to work», but as «disability to day-to-day activities» —following the recommendations of the World Health Organization; therefore, the self-justification bias does not contaminate the results.

We estimate the impact of employment promotion measures on the quality of the job match through non-experimental techniques (in particular, matching analysis). Our findings show that neither employment promotion measures nor specialized labour market intermediation services have significant effects on the quality of the job match for disabled workers.

The remainder of the paper is as follows. In the next section, we describe the theoretical framework. The third section describes the data set and the main variables of the empirical analysis, focusing on the definition of disability in the survey. The fourth section explains the details of the evaluation methodology. The fifth section presents and discusses the empirical results. The final section concludes.

2. Institutional background and hypotheses

2.1. Policies designed to promote the employment of people with disabilities

When considering hiring an individual with a disability, an employer might face a great deal of uncertainty about assessing the candidate's potential productivity, thereby increasing the perceived risk associated with hiring the individual. Several factors can affect this level of perceived risk, which can subsequently affect the hiring decision.

First, the employers' level of knowledge regarding the impairment might play an important role in assessing potential productivity. For instance, an employer with reasonably good knowledge of the individual's functional limitations because of his or her impairment and how is likely to affect work performance given the requirements of the job, might be able to make a more accurate assessment of an individual's potential productivity. Employers with less information are likely to make less accurate assessments.

Second, the degree to which the impairment is relevant to the work required can have a significant effect on perceived risk. For instance, an employer considering hiring as a telemarketer an individual who uses a wheelchair might expect the impairment to have no effect on job performance. However, the same employer looking to hire an individual suffering from chronic pain, might anticipate that the candidate will require frequent breaks and probably experience high absenteeism.

Given the potential uncertainty that employers might face in considering whether or not to hire persons with disabilities, employment promotion measures may improve the latter's likelihood of exiting from unemployment¹. This result might be attained due to the lower costs of hiring disabled workers with special contracts —associated to lower social security contributions— and, in general, due to lower non-wage costs of those newly hired workers. These financial incentives can be obtained by employers from the Spanish Public Administration as long as the worker hired is in possession of a disability certification, which is provided case-by-case by public health authorities under well-established medical protocols², and if the individual is registered as a disabled job seeker at the Public Employment Office. That is, employment promotion programs and specialized intermediaries give employers total freedom for selecting potential applicants into employment if the latter are in possession of a disability certification, and applicants themselves are unlikely to have a considerable degree of influence in the selection into the available program. Thus, in order to evaluate these measures, it is important to dispose of variables related to characteristics on which employers may base their decision of selecting workers with disabilities³.

Another way of improving workers' exit from non-employment is a change in their order in the «queue» of unemployment by giving them a sort of preference over non-disabled unemployed individuals. This is the case of a quota system, whereby a percentage of the new vacancies is reserved for people with disabilities⁴. Its rationale lies on the fact that prejudices or lack of information might prevent firms from hiring disabled individuals, even though they might have the same productivity as the remainder of workers. A similar rationale underlies the functioning of intermediation services designed for disabled individuals: they may cause an improvement in their entry (or re-entry) into the labour market. Since these intermediation services increase the information available for both firms and workers, the unemployment level related to the mismatch will presumably be lower. International evidence also shows that assistance with job search and placement planning (i.e., specialized labour market intermediation) is effective in improving placement rates and placement outcomes (Corden and Thornton, 2002). In addition, they can reduce the problems related to the existence of asymmetric information which are relevant for parties to any labour contract (as explained above)⁵. Finally, the promotion of sheltered employment centres — or *centros especiales de empleo*, which workforce has to be integrated, at least, by 70% of workers with disabilities in order to obtain the corresponding financial incentives— pretends to increase individuals' likelihood of moving into employment, as they give preference to the hiring of disabled persons⁶.

2.2. Hypotheses: the quality of the job match

The hypothesis in this paper is that the aforementioned policies may have impacts which go beyond any improvement in the likelihood of exiting from unemployment. Indeed, it is likely that these policies help enhance the quality of the job match for people with disabilities. This is important to the extent that equally qualified persons without disabilities will be substitutes for those with disabilities, and —all else being equal— when available, the former will be preferred to the latter in hiring situations where employers perceive great uncertainty about the productivity of individuals with disabilities. The implication is that the demand for the labour of people with disabilities will be greater when substitute labour is scarce (during an economic boom) and lower when substitute labour is in abundance (during a recession). Put another way, people with disabilities might be among the last hired and first fired over the ups and downs of the business cycle. Therefore, in this setting, if these policies increase the individuals' likelihood of attaining a permanent contract or reduce their likelihood of searching for another job, we would observe some lengthening in the duration of the underlying labour relationship (i.e., an enhanced stability in their careers). On the contrary, if these policies had a negative effect on the quality of the job match, then labour market integration of disabled individuals would be worsened.

There are many previous works (almost all of them influenced by Jovanovic, 1979) which model the labour market as different processes of job matching between jobs and workers. In spite of the fact that most of these optimal job matching models focus on the individual job search and are very abstract, they provide a theoretical framework which is use-

ful to understand firm behaviour related to the hiring of workers with disabilities and the quality of their job match. In this sense, in the search for employment, people with disabilities are likely to face higher costs than persons without disabilities, which might decrease the likelihood that a disabled individual will be matched with an appropriate job, and might also reduce the likelihood that the individual will enter the labour market ⁷.

We put forward the following hypotheses regarding the relationship between employment promotion measures and the quality of the job match. Firstly, measures which consist of reductions in hiring costs —reduction in non-wage costs, lower social security contributions, etc.— might have a two-fold impact on the quality of the job match. On the one hand, if there is a problem of prejudices or lack of information, this financial incentive might encourage firms to hire those disabled individuals who are as productive as non-disabled ones, and, therefore, would provide them with a match of higher quality. On the other hand, the financial incentive might even promote the hiring of those disabled individuals who are less productive than non-disabled ones, in view of the compensation which underlies the financial incentive of the contract. Presumably, in this latter case, those individuals with a poorer match will be among the first fired during economic crises.

Secondly, measures related to protected employment (as, for instance, quota systems) may have a significant effect on the quality of the job match in as much as they imply reductions in the amount of workers available for some jobs. Under a quota system, the firm needs to fill a vacancy by considering only a subgroup of the labour force (i.e., disabled individuals). Even taking into account the fact that these individuals might be negatively affected by discrimination based on prejudices or lack of information, reaching the same quality for the job match at a low cost of candidates' selection will presumably be more difficult. As a result, these measures will be likely to exert a negative impact on the quality of the job match. A similar problem arises with sheltered employment centres, but, in this case even more pronounced, given that a determined proportion of the staff needs to be selected among disabled individuals. Thus, the average productivity of these establishments is expected to be lower. If they are not protected from competition in the markets of goods and services their survival as productive organizations is likely to be threatened. On the contrary, if they are protected from the free market, then they are likely to become an end for disabled individuals' labour careers ⁸.

Finally, specialized labour market intermediation for disabled individuals might improve the quality of the match. The reason being that this type of intermediation provides expertise and information for both firms and workers, thereby, decreasing unemployment and the duration of vacancies related to the mismatch.

In summary, different effects are to be expected from those policies, to the extent that some of them may have, at the same time, positive and negative impacts on the quality of the job match. Therefore, only an empirical analysis will offer useful information to disentangle the likely impact of policies addressed to disabled individuals on their job match.

3. Data and descriptive analysis

The database used in this article is the Survey on Impairments, Disabilities and Health Status (*Encuesta sobre Deficiencias, Discapacidades y Estado de Salud*, EDDDES) launched in 1999. This survey was designed to obtain representative data on the incidence of disabilities in the Spanish population. For this purpose, the sample size was increased up to 79,000 households (around 250,000 individuals)⁹. Employment information was obtained (when possible) following the methodology of the Spanish Labour Force Survey. Information on the use of the different measures of employment promotion was obtained through direct questions on disabled individuals' current job.

An important characteristic of the survey is its definition of disability. This definition follows the recommendations of the World Health Organization, which defines the term «disability» as a consequence of impairments on an individual's activity. This means that disabilities are related to the individual, while impairments are related to problems of organs or biological systems of the body. In fact, sometimes impairments are compensated by the reception of technical help, so that they do not eventually lead to a disability¹⁰. Therefore, the information provided by the EDDDES-1999 is comparable to other surveys which follow the international definitions of the World Health Organization.

In addition, this definition of disability eludes the self-justification bias, since people can not classify themselves as disabled to work. That is, instead of asking whether the individual is disabled to work, information on disability is attained through questions on different aspects of the individual's day-to-day activities. In particular, the questionnaire asks for some daily activities included in a closed list of items, and whether or not the individual is limited to perform such activities¹¹. There are 36 activities integrated in the following groups: seeing, hearing, communicating, learning and application of knowledge, moving inside the household, using arms and legs, moving outside the household, caring for himself/herself, doing housework, and capability to establish relationships with other people. Therefore, the answer to any of these questions is not necessarily related to disability to work. This avoids the endogeneity bias of other surveys —such as, for instance, the Health and Retirement Survey of the United States¹².

An additional advantage of using the EDDDES-1999 is that its definition of disability does not include chronic illness. This distinction is important to the extent that the effects arising from chronic illness and the ones arising from disability may be different. For example, an individual who suffers from diabetes might develop a severe eyesight problem related to this chronic illness, but many other diabetic individuals may well not suffer such a type of disability. Therefore, a blind's relationship with the labour market as a consequence of diabetes will be very similar to the experience of other people who became blind due to other reasons, and substantially different from other diabetic individuals who are not blind¹³.

To sum up, the EDDDES-1999 database provides reliable information on employment promotion measures for people with disabilities, and its definition of disability is free from the most common problems associated in the current literature with disability.

Tables 1 and 2 present some basic information on the most important variables used in the empirical analysis ¹⁴. First of all, the prevalence ratio of disability in Spain is 5 per cent for working age and its distribution by gender is almost fifty-fifty. Its presence, however, is higher for women when people above 65 years-old are included (Malo, 2003). As usual, it increases with age, although in Southern European countries the relative importance among the 55-65 year-old interval is substantially higher than in the remainder of EU-15 countries (Malo and García-Serrano, 2001).

Table 1: Participation in the labour market and number of disabilities

	1	2	3	4 or more	Total
Employment	38.44	30.64	23.92	12.16	23.52
Unemployment	9.95	8.50	9.34	5.19	7.47
Inactivity	51.61	60.86	66.74	82.65	69.01
Total	100.00	100.00	100.00	100.00	100.00

Source: EDDDES-1999 and authors' calculations.

Table 2: Distribution of treatment status by the quality of the job match (type of contract and searching for another job) and distribution of the quality of the job match by treatment status

Type of contract	Treated	Controls	Total	Treated	Controls	Total
Temporary	22.99	77.01	100.00	33.33	26.84	28.10
Open-ended	17.97	82.03	100.00	66.67	73.16	71.90
Total	19.83	80.62	100.00	100.00	100.00	100.00
Searching for another job	Treated	Controls	Total	Treated	Controls	Total
Yes	24.07	75.93	100.00	6.88	5.22	5.54
No	19.11	80.89	100.00	93.12	94.78	94.46
Total	19.38	80.62	100.00	100.00	100.00	100.00

Source: EDDDES-1999 and authors' calculations.

In addition, the participation rate of disabled individuals is much lower than for non-disabled ones. In 1999, such a rate was 32 per cent in Spain, while it raised up to 50 per cent for total working-age population; for such a year, the employment rate was 24 and 42 per cent, respectively (Malo, 2003). However, the unemployment rate was much higher for the former (26 per cent) than for the latter (16 per cent). Table 1 shows that, as expected, inactivity increases with the number of disabilities, while the opposite is true for employment.

Table A.6 shows the description of the main variables of the empirical analysis. Our dataset contains 975 individuals (all of whom are wage and salary workers). As regards the proxies for the quality of the job match, there do not exist significant differences between

treated and controls: 73% of controls and 67% of treated are enjoying open-ended contracts, and 5% of controls and 7% of treated are searching for another job. There exists a relatively low rate of use of employment promotion measures: from 1 to 5 per cent. We have defined a dummy indicating the beneficiary status of any of such measures, which shows that almost one fifth (18 per cent) have passed through any employment promotion program, while 9 percent have used intermediation services in order to get employment. The proxies for the quality of the job match show that 72 per cent of individuals enjoy an open-ended contract, while 6 per cent are searching for another job. Therefore, there is a clear difference between the demand-side and the supply-side evaluation of the matching quality: the subjective (or supply-side) evaluation is better than the objective (or demand-side) one.

Table 2 shows the distribution of beneficiary status by the quality of the job match (type of contract held and whether or not the individual is searching for another job) and the distribution of the quality of the job match by treatment status. Approximately, 77 per cent of disabled individuals with a temporary contract are in the non-beneficiary category (i.e., they are neither addressing to specialized intermediaries nor are recipients of any employment promotion measure). This percentage rises up to approximately 82 per cent among disabled individuals holding open-ended contracts. Being beneficiary of either promotion measures or of specialized intermediation is slightly larger among individuals holding temporary contracts (80.89 versus 75.93). In addition, among treated individuals, two thirds are holding an open-ended contract, and most of them (93.12%) are not searching for another job. Among controls, those figures do not substantially vary: only 26.84% are holding temporary contracts, while 94.78% are not searching for another job.

To sum up, this descriptive approach shows a relative low use of employment promotion measures for people with disabilities, and there seems to be only slight differences in the proxies of the quality of the job match.

4. Evaluation methodology

4.1. The evaluation problem and non-experimental evaluation techniques

The main purpose of this paper is to assess the impact of employment promotion measures on the quality of the jobs found by disabled people¹⁵. Assuming that measure recipients were a random sample of all those eligible, a valid approach to estimate the effect of such measures would be to compare the outcome of the former with those of non-recipients. However, where administrators (or firms) are discriminating between the less and better able as a basis for measure selection, this process would bias estimates of their potential effects if it is unobserved by the evaluator. For instance, if firms are taking the best for the measures (i.e., they are «cream-skimming») measure effects would be over-estimated; similarly, measure effects may be underestimated if firms were targeting resources on the least able. In other words, the effect of employment promotion measures can be characterized by two distinct processes: on the one hand, being recipient of the measure; on the other hand, the process determining the outcome (i.e., job quality). The question of selection bias arises when

some component of the recipient process is relevant to the process determining job quality. If the relationship between the two processes can be fully accounted for by observable characteristics, selection bias will simply be avoided by including the relevant variables in the equation explaining outcomes. However, if unobservable characteristics affecting participation can also influence outcomes, controlling for differences in observable characteristics does nothing to address the issue of sample selection and, therefore, the estimated treatment effect will be biased. This is the essence of the selection problem.

In order to assess the effects of employment promotion measures on a recipient individual, one must compare the observed outcome —i.e., the factual outcome— with the outcome that would have resulted had that person not been recipient of the measure —i.e., the so-called counterfactual outcome. However, only the former is actually observed, and this is the reason for the evaluation problem, which, in essence, is one of missing data. To overcome this problem, all approaches to evaluation attempt to provide an estimate of the counterfactual in order to identify measure effects. There are two questions which evaluations might wish to address. The first is what impact programme participation would have on an individual drawn randomly from the population —the average treatment effect (ATE). The second is what impact participation has on individuals who actually participated —the average effect of treatment on the treated (ATT). These two effects are identical if we assume homogeneous responses. However, where we allow for the more realistic scenario of responses varying across individuals, the measures can likewise differ. Both estimates are of interest. While ATT indicates the average benefit of participation, ATE would be relevant when the policy interest is focused on making a voluntary programme compulsory, for example (see Bryson *et al.*, 2002).

Several alternative approaches exist that take explicit account of the selection issue. These can be grouped under the broad headings of experimental and non-experimental approaches¹⁶. The non-experimental techniques share one thing in common: in the absence of an observable counterfactual, assumptions have to be made to identify the causal effect of a policy or programme on the outcome of interest. There are broadly two main categories of non-experimental methods: before-after estimators and cross-section estimators (Heckman and Smith, 1999). The former have been widely used in evaluations, but require longitudinal or repeat cross-section data, which may not be often available¹⁷ (as it occurs in our case). Our dataset is suitable for cross section estimators, which use non-participants to derive the counterfactual for participants. The method of matching constitutes one way of doing this, along with instrumental variables technique (IV) and the Heckman selection estimator¹⁸. The general matching method is a non-parametric approach to the problem of identifying the treatment impact on outcomes. It consists of contrasting the outcome of measure recipients with the outcomes of «comparable» non-recipients —i.e., individuals sharing similar characteristics. It assumes that selection can be explained purely in terms of observable characteristics, since the choice of the match is dictated by observable characteristics.

Although the technique was developed in the 1980s (Rosenbaum and Rubin, 1983) and has its roots in a conceptual framework which dates back even further (Rubin, 1974), its use

in labour market policy evaluation only became established in the late 1990s. It gained particular prominence following the work of Dehejia and Wahba (1998, 1999) who, in reanalysing a sub-set of the data used in LaLonde's (1986) seminal work—which had established the superiority of experimental estimators—indicated that propensity score matching performed extremely well¹⁹. As we shall see, the method has an intuitive appeal arising from the way it mimics random assignment through the construction of a control group *post hoc*.

The parameter of interest can be formally described as follows. For any disabled individual, define random variables representing the job quality the individual would have attained had he been a recipient of employment promotion measures, and the job quality the individual would have attained had he not. Denote these two potential outcomes by Y_1 and Y_0 , and denote employment promotion measure recipient status by a dummy variable, D . For each individual, we observe only $Y = Y_0 + (Y_1 - Y_0)D$, so Y_0 is not observed for measure recipients, and Y_1 is not observed for non-measure recipients. We might nevertheless still hope to identify certain averages of $Y_1 - Y_0$. The effect of treatment on the treated (Rubin, 1977) is one such parameter:

$$E[Y_1 - Y_0 | D = 1] = E[Y_1 | D = 1] - E[Y_0 | D = 1] \quad (1)$$

This tells us whether, on average, programme recipients benefited or suffered from participation in the employment promotion programme.

Simple comparisons by programme recipient status can be used to estimate $E[Y_1 - Y_0 | D = 1]$. However, such comparisons do not control for most of the criteria used by employers to choose which disabled persons to accept. The job quality of non-accepted disabled individuals might therefore provide a poor indicator of what measure recipients would have achieved if they had not enjoyed any employment promotion measure. To explore this point further, note that the comparison by employment promotion measure recipient status can be decomposed as follows:

$$E[Y_1 | D = 1] - E[Y_0 | D = 0] = E[Y_1 - Y_0 | D = 1] + \{E[Y_0 | D = 1] - E[Y_0 | D = 0]\} \quad (2)$$

This shows that comparison of job quality by beneficiary status is equal to $E[Y_1 - Y_0 | D = 1]$ plus a bias term attributable to the fact that job quality of non-recipients is not necessarily representative of what recipients would have enjoyed had they not passed through any employment promotion measure. That is, since measure beneficiary choices are likely to be the result of systematic decisions, the sample of individuals who are assigned to an employment promotion measure will not be random. If this is ignored and individuals who pass through employment measures are simply compared with those who did not, the estimates will suffer from bias²⁰.

4.2. Selection on observables: propensity score matching

The matching method attempts to mimic *ex post* an experiment by choosing a comparison group from among the non-treated individuals such that they are as similar as possible to the treatment group in terms of their observable characteristics. All the outcome-relevant differences between treated and non-treated individuals are captured in their observable attributes, the only remaining difference between the two groups being their treatment status. In this case, the average outcome of the matched non-treated individuals constitutes the correct sample counterpart for the missing information on the outcomes the treated would have experienced, on average, had they not been treated.

This way of overcoming the missing counterfactual rests on the so-called conditional independence assumption (CIA) between non-treatment variables and the programme participation status D . This implies that if one can control for observable differences in characteristics between the treated and non-treated group, the outcome that would result in the absence of treatment is the same in both cases. It allows the counterfactual outcome for the treatment group to be inferred, and therefore, for any differences between the treated and non-treated to be attributed to the effect of the programme:

$$Y_1, Y_0 \perp D \mid X \quad (3)$$

This assumption of selection on observables requires that, conditional on an appropriate set of observed attributes, the distribution of the (counterfactual) outcome Y_0 in the treated group is the same as the (observed) distribution of Y_0 in the non-treated group. Therefore, if the conditional independence assumption holds, the matching process is analogous to creating an experimental dataset in that, conditional on observed characteristics, the selection process is random. Consequently, the distribution of the counterfactual outcome for the treated is the same as the observed outcomes for the non-treated.

However, when a wide range of X variables is in use, finding exact matches can be extremely difficult. This obstacle was overcome thanks to an important result showing that matching on a single index reflecting the probability of participation could achieve consistent estimates of the treatment effect in the same way as matching on all covariates. Following Rosenbaum and Rubin (1983)²¹, distance can be measured in terms of a balancing score $q(X)$, defined as a function of the observables such that $X \perp D \mid q(X)$. One of such balancing scores is the propensity score, $p(X)$, the probability to receive treatment given the set of pre-treatment characteristics:

$$p(X) \equiv \Pr(D=1 \mid X) = E(D \mid X) \quad (4)$$

As Rosenbaum and Rubin (1983) show, by definition, treatment and non-treatment observations with the same value of the propensity score have the same distribution of the full vector of regressors X independently of the treatment status. In other words, for a given propensity score, exposure to treatment is random and therefore, treated and control units should

be on average observationally identical. Propensity score thus reduces the high-dimensionality problem to a one-dimensional one: the estimation of the mean outcome in the non-treated group is a function of the propensity score.

However, this problem of reduced chances of finding a match does not disappear entirely with propensity score matching. It is still possible that there will be nobody in the non-treatment group with a propensity score that is «similar» to that of a particular treatment group individual. This is known as the «support» problem. In order to overcome it, one has to identify participants who are poorly matched and then omit them from the estimation of treatment effects, so that any combination of characteristics seen among those in the treatment group may also be observed among those in the non-treatment group. That is, when there is no support for the treated individual in the non-treated population, this treated individual is dropped from the analysis. The estimated treatment effect has then to be redefined as the mean treatment effect for those treated falling within the common support.

The explicit acknowledgement of the common support problem is one of the main features distinguishing matching methods from standard parametric regressions. The other main distinguishing feature is that matching is non-parametric. Consequently, it avoids the restrictions involved in models that require the relationship between characteristics and outcomes to be specified.

5. Estimations

5.1. Estimating the propensity score: Can the CIA be justified in our case?

The effects of employment promotion measures refer in this paper to their impact on the job quality of measure recipients through two distinct outcomes — (i) having a permanent contract; (ii) searching for another job— relative to what would have happened to recipients if they had not passed through the measure ²². Our dataset contains 975 individuals. Out of these, 189 have passed either through any employment promotion program, or through specialized intermediation services. Although from the institutional point of view some differences exist among both groups of measures (see Section 2 above), we have treated both measures as if they were only one, since, in essence, the expected outcome from both types of policies is the same.

Our propensity score model is fitted as a *probit* regression model where the dependent variable indicates being recipient of any measure (either employment promotion or specialized intermediation services), and the independent variables are the factors thought to influence participation and outcome.

As stated in the previous section, the matching strategy builds on the Conditional Independence Assumption (CIA), requiring that the outcome variable must be independent of

treatment conditional on the propensity score. This implies that selection is solely based on observable characteristics and that all variables that influence treatment assignment and potential outcomes simultaneously are observed by the researcher (Caliendo *et al.*, 2005)²³. Hence, implementing matching requires choosing a set of variables X that credibly satisfies this condition. Therefore, one needs to first consider the mechanisms through which individuals join in a programme and then to assess whether the available regressors capture all the relevant factors affecting the participation decision and future potential outcomes²⁴. In addition, we must take into account that only variables that are unaffected by participation, or the anticipation of participation, should be included. To do otherwise would be to mask possibly important programme effects, undermining the interpretability of estimated effects (see Heckman, LaLonde and Smith, 1999).

As regards selection of disabled individuals into employment promotion measures and of specialized intermediaries, both are likely to be a result from employers' decisions, as applicants themselves are unlikely to have a relevant degree of influence in the selection into the available program (as was explained earlier in Section 2.1). Fortunately, our dataset offers sufficiently rich information on pre-measure variables, which are likely to be important predictors of measure beneficiary and outcomes. The value of these variables is that they contain pre-measure information which may be critical in estimating measure beneficiary status and post-measure outcomes. Moreover, they may help capture otherwise unobservable characteristics —such as motivation— which might also influence participation and outcomes. To capture selection by employers, educational qualifications and, in particular, applicant's health status is crucial, in that it affects candidate's potential productivity at a given time and future labour market outcomes. Health variables measured before beneficiary status are divided in the following groups:

- The type of disability suffered by the individual (eyesight, hearing, language, understanding, travelling, physiological needs, not capable to do the housework or relationship difficulties)
- Whether the individual suffering any of such disabilities receives help (either technical or personal help)
- Whether the disability's degree of severity is slight or moderate (very severe will be the reference category)
- Age at the date of disability diagnosis
- Whether or not the individual suffers only one disability
- Whether or not he/she has a certificate of disability
- Whether or not he/she receives any sort of financial subsidy or benefit
- Whether or not he/she belongs to a non-profit organization for disabled people

Similarly, factors related to potential returns from participation (e.g., age, previous stock of human capital in terms of level of education) have also been included in the condi-

tioning set. Among the potential predictors of measure beneficiary and subsequent employment outcomes we have also included the following ones: civil status, whether or not the individual is the main person in the household, household size and the region of residence. The aforementioned variables are either fixed over time (e.g., gender) or were collected at the date of eligibility and, as such are unaffected by measure beneficiary²⁵. Thus, the empirical analysis includes many of the variables we would expect to influence participation and labour market outcomes for the two groups of individuals, since rich data were available from the survey. This allows us to credibly justify the CIA and the matching procedure (Table 3).

Table 3: Data used to generate propensity scores

<p>Demographic</p> <ul style="list-style-type: none"> — gender — age <p>Qualifications</p> <ul style="list-style-type: none"> — followed training courses — level of education 	<p>Household</p> <ul style="list-style-type: none"> — head of household — household size — civil status — region of residence <p>Health status</p> <ul style="list-style-type: none"> — financial subsidies/benefits — number of disabilities — age of disability diagnosis — type of disability — reception of help — disability's degree of severity — possession of disability certificate — belongs to a non-profit organization for disabled people
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As shown in Table 4, the propensity to be recipient of employment promotion measures or specialized intermediation services is higher than average if disabled individuals are in possession of a certificate of disability, if they are men, if they receive financial subsidies or benefits, if they belong to a non-profit organization for disabled people or if they have followed vocational training courses. In addition, the type of disability becomes a key determinant of measure beneficiary, in the sense that those with hearing disability receiving help are more likely to become measure recipients, as well as those who suffer from understanding disability (to a slight or moderate degree), and from travelling or understanding disability diagnosed before the age of sixteen. On the contrary, those with college degree and those who suffer from hearing disability, eyesight disability (to a slight or moderate degree) or from disability to undertake housework which was diagnosed before the age of sixteen are less likely to benefit from either employment promotion measures or specialized intermediation.

Table 4: Propensity score estimations (probit model)

	Empl. Promotion & Intermediation Services	
	Coef.	Z
Only one disability	-0,127	-0,730
Disability certificate	1,076	6,850
Gender (1=Men)	0,460	2,760
Age	-0,045	-1,070
Age squared	0,000	0,570
Marital status (1=married)	-0,260	-1,440
Head of the household (1=Yes)	0,081	0,450
Household size	0,016	0,310
Financial subsidies or benefits (1=Yes)	0,308	2,040
Belongs to a non-profit organization for disabled people	0,751	4,270
Has followed vocational training courses	0,348	2,070
Illiterate or without studies	-	-
Primary studies	0,177	0,810
Middle school	-0,172	-0,560
Vocational training	-0,211	-0,650
College degree	-0,564	-1,900
Eyesight disability	-	-
Hearing disability	-0,804	-2,160
Language disability	0,473	1,260
Understanding disability	-0,993	-1,010
Travelling disability	0,303	1,190
Physiological needs disability	-0,184	-0,190
Disability to undertake housework	0,469	1,190
Relationship disability	-0,894	-1,200
Eyesight disability & receives help	0,351	1,130
Hearing disability & receives help	0,803	2,640
Language disability & receives help	0,429	0,590
Understanding disability & receives help	1,073	1,100
Travelling disability & receives help	0,135	0,720
Physiological needs disability & receives help	0,204	0,240
Disability to undertake housework & receives help	-0,153	-0,450
Relationship disability & receives help	-1,567	-1,280
Eyesight disability & slight or moderate severity	-0,585	-2,120
Hearing disability & slight or moderate severity	0,510	1,480
Language disability & slight or moderate severity	-0,253	-0,430
Understanding disability & slight or moderate severity	1,261	2,030
Travelling disability & slight or moderate severity	-0,065	-0,350
Physiological needs disability & slight or moderate severity	-0,205	-0,300
Disability to undertake housework & slight or moderate severity	0,438	1,420
Relationship disability & slight or moderate severity	1,187	1,610
Eyesight disability & under 16	0,328	1,390
Hearing disability & under 16	0,201	0,680
Language disability & under 16	-0,452	-0,920
Understanding disability & under 16	1,822	1,950
Travelling disability & under 16	0,361	1,820
Physiological needs disability & under 16	0,392	0,650
Disability to undertake housework & under 16	-0,867	-2,350
Relationship disability & under 16	-0,343	-0,390
Region: South	0,003	0,020
Region: East Coast	-0,100	-0,550
Region: North Coast	-0,197	-0,930
Region: Ebro River	0,203	0,710
Region: Centre (Castilla and Madrid)	-	-
Region: Balearic and Canary Islands	-0,119	-0,400
Constant	-0,990	-1,100
Observations		975
Log likelihood		-261.48572
Prob>chi2		0.0000

5.2. Implementing propensity score matching estimators

An estimate of the propensity score is not enough to estimate the average treatment on the treated (ATT) of interest, given that the probability of observing two units with exactly the same value of the propensity score is in principle zero, since $p(X)$ is a continuous variable (see equation [4] above). Various methods have been proposed in the literature to identify the comparison group through propensity score matching. Those methods reach different points on the frontier of the trade-off between quality and quantity of the matches and none of them is a priori superior to the others. Thus, their joint consideration in our empirical analysis offers a way to assess the robustness of the estimates. We have used the publicly available Stata command developed by Leuven and Sianesi (2003) that performs the types of propensity score matching presented in this section. Table 5 shows estimated ATT and ATE, where the treatment refers to either being recipient of any employment promotion measures or of specialized intermediation services. We have imposed with all these methods the common support restriction. This way, we ensure that any combination of characteristics seen among those in the treatment group may also be observed among those in the non-treatment group (as commented on above) ²⁶.

The traditional and most intuitive form of matching is *nearest-neighbour* (or *one-to-one*) matching, which takes each treated unit and searches for the control unit with the closest propensity score. The resulting set of non-treatment individuals constitutes the comparison group. Although it is not necessary, the method is usually applied *with replacement*, in the sense that a control unit can be a best match for more than one treated unit. Matching with replacement in this way is less demanding in terms of the support requirement since individuals in the comparison group who would provide the closest match to a number of treated individuals remain available ²⁷. Once each treated unit is matched with a control unit, the difference between the outcome of the treated units and the outcome of the matched control units is computed. The ATT of interest is then obtained by averaging these differences. Estimated nearest-neighbour treatment effects (ATT) for employment promotion measure beneficiary (Table 5) show a negative effect for the outcome of reaching a permanent contract, and a positive effect for the outcome of searching for another job. However, none of these effects is statistically significant.

Some of the matches found through nearest-neighbour might be fairly poor because for some treated units the nearest neighbour may have a very different propensity score and nevertheless he would contribute to the estimation of the treatment effect independently of this difference. The *radius* and *kernel matching* methods offer a solution to this problem. With radius matching, each treated unit is matched only with the control units whose propensity score falls in a predefined neighbourhood of the propensity score of the treated unit. If the dimension of the neighbourhood (i.e., the radius) is set to be very small, it is possible that some treated units are not matched because the neighbourhood does not contain control units. That is, the smaller the radius, the more difficult it is to find a match within that range, resulting in a greater number of cases failing the support requirement. On the other hand, the smaller the size of the neighbourhood, the better is the quality of the matches. Results, therefore, may be

**Table 5: Average treatment effect on the treated (ATT) and average treatment effect (ATE).
The treatment refers to either having been recipient of any employment promotion measures or having access to employment through specialized intermediation services for disabled people**

OUTCOME:	Matching method	ATT	ATE
Reaching a permanent contract	Nearest-neighbour matching method with replacement & common support	-.0743 (.0780)	.0196 (.0884)
	Radius matching with common support		
	Caliper 0.005	-.0758 (.0753)	-.0137 (.0962)
	Caliper 0.01	-.0778 (.0774)	-.0099 (.0874)
	Caliper 0.02	-.0562 (.0752)	-.0173 (.0834)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	-.0544 (.0780)	-.0038 (.0884)
	<i>Gaussian kernel</i>	-.0509 (.0762)	.0008 (.0870)
	<i>Biweight kernel</i>	-.0534 (.0774)	-.0060 (.0874)
	<i>Uniform kernel</i>	-.0545 (.0752)	.0005 (.0834)
Searching for another job	Nearest-neighbour matching method with replacement & common support	.0270 (.0474)	.0357 (.0376)
	Radius matching with common support		
	Caliper 0.005	.0120 (.0527)	.0409 (.0607)
	Caliper 0.01	.0355 (.0807)	.0488 (.0841)
	Caliper 0.02	.0207 (.0769)	.0504 (.0817)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	.0177 (.0753)	.0426 (.0880)
	<i>Gaussian kernel</i>	.0136 (.0749)	.0381 (.0856)
	<i>Biweight kernel</i>	.0189 (.0807)	.0428 (.0841)
	<i>Uniform kernel</i>	.0147 (.0769)	.0419 (.0817)

Note: The entries in brackets are the bootstrapped standard errors (500 replications).

sensitive to the size of the radius that is the basis for matching. We tested the sensitivity of our results to three radii: 0.005, 0.01 and 0.02.

In kernel-based matching, all treated are matched with a weighted average of *all* controls with weights that are inversely proportional to the distance between the propensity scores of treated and controls. The «kernel» is a function that weighs the contribution of each comparison group member, so that more importance is attached to those matched control units providing a better match. The most common approach is to use the normal distribution (with a mean of zero) as a kernel, where the weight attached to a particular comparator is proportional to the frequency of the distribution for the difference in scores observed. This means that exact matches get a large weight, and poor matches get a small weight.

As regards the likelihood of attaining a permanent contract (see Table 5), radius matching offers an estimated negative ATT. Once again, neither the estimated results with radius matching nor with kernel matching are statistically significant.

Note also that in Table 5 the estimated ATE is never significant, implying that a disabled individual randomly chosen from the population and who passed through any employment promotion measure would not achieve a significantly different job matching quality compared to the hypothetical situation where he/she would not have been beneficiary of any of such measures.

Thus, as a summary, the propensity score evaluation indicates that participation in employment promotion measures or in specialized intermediation has no significant effect on the quality of the job match. A larger likelihood of searching for another job (implying lower satisfaction with actual employment)—a result which was apparent in the raw data of descriptive results (see Section 3 above)—is no longer apparent once participation in these policies are compared with «like» non-participants. Thus, differences in outcomes between the two groups (if any) are attributable to comparative advantages that are independent of the employment promotion measures. Similarly, specialized intermediation presents a non-significant impact both on the probability of finding a permanent job and on the probability of searching for another job.

A possible interpretation of these results is that disabled workers who are beneficiaries of employment promotion measures or specialized labour market intermediation will enjoy a similar quality in their job matches as other disabled workers do. Therefore, these active labour market policies will have neither an adverse effect on separation probabilities under an economic crisis nor a positive effect. It is important to remark that our results have no implications regarding the quality of the job match of disabled workers compared to the average quality of the job match of non-disabled workers²⁸. Finally, if we regard having an open-ended contract and not searching for another job as signals of a long-term attachment to the labour market, we must conclude that these policies do not improve disabled individuals' long-term attachment to the labour market.

5.3. Assessment of matching quality

The final step in applying matching should be to test the resulting matching quality in terms of covariate balance in the matched groups. To be effective, matching should balance

characteristics across the treatment and matched comparison groups. A measure of the bias can be calculated for each characteristic in order to achieve a standardised indicator of the degree to which the matching has been successful in balancing (see, for example, Sianesi, 2001).

Table 6 provides some diagnostics on the performance of the match for employment promotion measures and specialized intermediation. Each cell represents the percent reduction in the bias (between members of the treatment group and those of the comparison group) for significant covariates used to model treatment status. The bias is the difference of the sample means in the treated and non-treated (full or matched) sub-samples as a percentage of the square root of the average of the sample variances in the treated and non-treated groups (formulae from Rosenbaum and Rubin, 1985). Ideally, one would have a 100 percent reduction in every significant covariate. As can be observed, while in Table 6, the bias is not reduced for the covariate «Hearing disability and receives help» (the corresponding cell figures are negative). In addition, note also that reduction in covariate imbalance is not especially high in some variables for the nearest-neighbour technique (in fact, the nearest method, as previously underlined, may at times turn out to be quite apart). Therefore, we can conclude that matching quality is better for Epanechnikov, Gaussian and Biweight kernel. In addition, the results have shown that the model of measure participation appears plausible and includes a number of significant variables in all cases. This, together with the rich vari-

Table 6: Percent reduction in covariate imbalance after propensity score matching for employment promotion measures and intermediation services

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disability certificate	95.6	98.7	99.4	99.4	99.4	96.1	99.5	99.1
Gender (1=Men)	54.4	79.5	88.2	84.4	90.2	88.0	87.1	94.4
Financial subsidies or benefits (1=Yes)	81.1	98.5	85	86.6	88.7	91.6	88.6	88.3
Belongs to a non-profit organization for disabled people	98.3	89.9	96	98.4	96.4	94.6	96.1	97.2
Has followed vocational training courses	62.3	82.3	86.6	94.5	91.5	85.9	92.1	88.4
College degree	91.9	86.3	94.6	87	85.8	90.0	84.1	90.1
Hearing disability	90.6	95.9	93.3	91.6	94.0	92.1	94.8	92.4
Hearing disability & receives help	-1150.8	-1320.1	-853	-300	-302.3	-275.1	-375.3	-165.2
Eyesight disability & slight or moderate severity	71	65.9	83.9	82.2	81.3	81.4	81.8	69.7
Understanding disability & slight or moderate severity	93.3	90.9	99.4	97.6	96.4	92.7	96.0	92.4
Understanding disability & under 16	95.2	92.7	91.2	94.8	94.4	94.8	93.7	96.4
Travelling disability & under 16	100	98.6	94.6	97.3	96.1	97.1	96.3	95.3
Disability to undertake housework & under 16	91	90.4	97.9	94.9	96.9	97.9	97.1	97.6

Notes: This table shows the convergence of mean values on key variables in the propensity score equation, with non/participant characteristics closely resembling those of participants after matching. The bias is the difference of the sample means in the treated and non-treated (full or matched) sub-samples as a percentage of the square root of the average of the sample variances in the treated and non-treated groups (formulae from Rosenbaum and Rubin, 1985).

- (1) Nearest-neighbour matching method with replacement & common support
- (2) Radius matching with common support, caliper 0.005
- (3) Radius matching with common support caliper 0.01
- (4) Radius matching with common support, caliper 0.02
- (5) Epanechnikov kernel
- (6) Gaussian kernel
- (7) Biweight kernel
- (8) Uniform kernel

able set used in the modelling, provides some reassurance that the matching approach is successfully controlling for those characteristics that might be expected to result in differences in outcomes between participants and non-participants.

5.4. Results for disaggregate groups: Heterogeneity effects

At no stage of the evaluation procedure it was assumed that the causal effects of participating in employment promotion measures of specialized intermediation needs to be individually homogeneous. In fact, it is one of the advantages of matching that the assumption of homogeneity of effects is not necessary. If the individual effects are heterogeneous—which is possible given different personalities, employment initial conditions, regions, etc.—the causal effect in the groups of participants will not be estimated accurately.

The mean causal effects have been estimated for various sub-samples of disabled individuals and their matched pairs in order to analyse the heterogeneity issues. The following groups are considered (Table A.1-A.5): individuals who pass through employment promotion measures, men, individuals below 53 years-old, individuals without certificate of disability and those suffering more than one disability. The estimation steps applied in section 5.2. have been applied for every sub-sample under consideration. As can be observed in the appendix, for no sub-group we find causal effects to be statistical significant. Therefore, heterogeneity is not empirically relevant as regards the aforementioned variables when assessing the impact of employment promotion measures and specialized labour market intermediation on the quality of disabled people job matches.

6. Conclusions

In this article we have analysed the effect of policies addressed to the employment promotion of people with disabilities on the quality of their job match. This constitutes a novelty in the literature, since previous research has mainly focused on the disincentive effects that income transfers have on the activity of disabled individuals. Our analysis is directly related to the attachment that people with disabilities have to the labour market. Those with a poor match will presumably suffer a higher dismissal probability in an economic crisis, worsening their welfare and creating disruptions in their labour career. Anyway, as Jovanovic (1979) explains, the job is an experience good and when the quality of the job match is low the separation probability (by either dismissal or quit) will increase. Therefore, it is crucial to assess whether policy programmes intended to improve labour market participation of disabled people inflict a positive or a negative effect (or any effect at all) on the quality of their job match.

In addition, our empirical analysis uses a Spanish database which is especially launched to have an accurate picture of people with disabilities and their relationship with the labour market. Following the recommendations of the World Health Organization, this database uses a definition of disability based on day-to-day activities (instead of disability to work),

and, therefore, eliminates the potential bias of self-reported disability measures (which is an endogeneity bias²⁹). Therefore, the data used are especially suitable for the objective of our empirical analysis.

We have applied a non-experimental evaluation methodology: matching analysis. We have used two variables as proxies for quality: the type of contract held and whether or not the worker is searching another job. The former can be understood as a «demand-side» valuation of the quality of the job match, because the type of contract is mainly (and usually) decided by the firm and the worker either accepts or rejects it. The latter is a «supply-side» valuation, because for workers who are searching for another job, one can deduce that there is not a perfect match between their current position and the one which would be optimal at their current firm. Our main result is that policies promoting the employment of disabled individuals do not improve the quality of their job match (either valued from the demand or the supply side).

Policy implications from these results are neither pessimistic nor optimistic. The analyzed measures do not have positive effects on the quality of the job match and, therefore, they are not stepping stones in the labour careers of workers with disabilities. The fact that those measures do not increase the quality of the job match respect to workers who are not beneficiaries of these measures is somewhat worrying. Particularly, in the case of specialized labour market intermediation services, which not only should increase individuals' probability of participation in the labour market, but also the quality of their job match. It is likely that employment promotion measures and intermediation services are mainly focused on solving short-term problems related to job entry. Instead of this, they should adopt a wider perspective in relation to the labour career prospects of workers.

In order for employment promotion measures to exert a positive impact on job quality, one possibility would be to relate such measures with financial incentives for the permanence of workers at their current employers. In the Spanish labour market, some efforts implemented to provide financial support for permanent contracts go in this direction. In particular, financial incentives for conversions of temporary contracts into permanent ones are presumably the most promising variant of this policy for disabled individuals.

On the other hand, specialized intermediation services should provide long-term advice (instead of just helping workers to find a job). Our results suggest that a strategy based on «any job is better than no job at all» is probably not always appropriate, since no positive impacts are observed on the quality of the job match for people with disabilities. Thus, workers with disabilities are being left aside in their traditional weak position in the Spanish labour market. We are conscious of the fact that looking for exclusively «good» jobs is not the best strategy either. That is, our recommendation is in line of making workers with disabilities to obtain advice and intermediation as regards their labour careers as a whole (instead of only focusing on their short-term gains in the labour market). For this purpose, financial incentives should be based on a long-term perspective regarding the quality of their job match.

Notes

1. In fact, employment promotion measures for disabled people can be considered as a particular case of active labour market policies. For a more detailed analysis of those measures, the reader is referred to CES (2003), Esteban (1999) or Romero (2003).
2. The certification is the official recognition as disabled and is only granted in case that the disability degree is 33 percent. On the other hand, being registered as a disabled job seeker is not a restricting condition: whenever an employer finds a person with disabilities who is suitable to be hired, the latter can address any public employment office some previous days in order to get this requirement fulfilled.
3. As explained more thoroughly in Section 5.1 below, we use variables such as educational qualifications and, in particular, applicant's health status. Similarly, factors related to potential returns from participation (e.g., age, previous stock of human capital in terms of level of education) will also be included in the conditioning set.
4. In particular, if the firm has more than 50 employees, it is compulsory to dedicate, at least, 2% of the vacancies to disabled individuals.
5. It is important to remark that the quota system and the use of specialized intermediation services are fully compatible with the use of labour contracts with a financial incentive. In fact, this will be the most common case: when employers want to fulfil the quota for workers with disabilities, they will use these special contracts in order to ask for public incentives.
6. The percentage of disability suffered by these workers must be 33 or higher.
7. Higher search costs might partly be related to the characteristics of the disability, which could make communicating and interviewing with employers more expensive. In addition, an individual with a disability requiring expensive care technologies has greater resource needs during the search process than a person without disabilities who is otherwise identical. This might significantly reduce the amount of time that the individual is able to search before accepting a job, resulting in a job of lower quality than the one of individuals who have enough resources to search for a longer period (see Livermore *et al.*, 2000).
8. As, in fact, they are not firms—they are unable to provide the experience required by «normal» firms. For the Spanish case, Malo and Rodríguez (2000) find that sheltered employment centres are usually the end of the labour careers of disabled individuals who are working there. There even exist incentives for sheltered employment centres in order not to promote the transition of their «best» workers towards «normal» firms, since these centres' average productivity would then be negatively affected.
9. A similar survey was launched in Spain in 1986. In spite of the fact that this previous survey was very useful to obtain basic information on disabled individuals in Spain, its information on employment (and, in general, on the labour market participation of people with disabilities) was rather limited. However, this experience was useful to include a battery of questions related to employment and labour market in the EDDDES-1999.
10. The most common example is that glasses compensate the impairment of myopia. Otherwise, myopia would make more difficult the individual's daily activity. In fact, as the case of glasses is an extended situation, they are included in the survey only when the eyesight problems are very severe.
11. Therefore, this survey is based on *subjective* information about limitations to daily activities. This procedure is commonly used in health and disability surveys to the whole population. Only when a health survey is focused on a very specific group, medical and technical diagnosis can be used to evaluate how individuals are affected by disabilities, chronic illnesses, syndromes, etc.
12. The question of the Health and Retirement Survey is the following: *Do you have any impairment or health problem that limits the amount of paid work you can do? If so, does this limitation keep you from working altogether?* Obviously, the results of any analysis on employment of disabled people will be heavily biased by the use of this question in order to classify them as disabled or non-disabled. See, for instance, Benítez-Silva *et al.* (2004) about how to deal with this bias created by the definition of disability as disability to work.

13. This is particularly relevant in the special module on disability of the European Labour Force Survey, launched in 2002, where individuals are asked about disability *and* long-term health problems. Therefore, analyses using the European Labour Force Survey will be different from those obtained from surveys using definitions following WHO recommendations (as the Spanish EDDDES-1999).
14. In addition, Table A.6. in the appendix shows means and standard deviations of the main variables.
15. As one analyst has recently noted: «The task of evaluation research lies in devising methods to reliably estimate [the impact of policy change], so that informed decisions about programme expansion and termination can be made» (Smith, 2000:1).
16. To examine the rationale for field experimentation in economics, see Burtless, 1995.
17. For details, see Heckman and Smith (1999), and Blundell and MaCurdy (1999)
18. See Heckman, 1995, or Blundell and Costa Dias, 2000 for the IV estimator, and Goldberger (1983) or Puhani (2000), for the Heckman selection estimator.
19. This work has been subsequently criticised in studies which show that propensity score matching, like other non-experimental techniques, depend on assumptions about the nature of the process by which participants select into a programme, and the data available to the analyst (Smith and Todd, 2003; Heckman *et al.*, 1998; Agodini and Dynarski, 2001). Nevertheless, the technique continues to attract attention as a useful evaluation tool in the absence of random assignment.
20. On the contrary, if employment promotion measure beneficiary status was randomly assigned, then D would be independent of Y_0 and Y_1 , implying $E[Y_0 | D = 0] = E[Y_0]$, and $E[Y_1 | D_1 = 1] = E[Y_1]$. In this case, the effect of treatment on the treated is also the average treatment effect in the population subject to randomization and can be estimated by simple comparisons.
21. Another unit-free metric, is the Mahalanobis one, which assigns weight to each coordinate of X in proportion to the inverse variance of that coordinate (see Blundell *et al.* 2004). See, also, Abadie and Imbens, 2002, and Zhao, 2004, for alternative matching metrics.
22. Our outcome variables are discrete in our application. Some research in the evaluation literature makes special assumptions for the analysis of discrete data outcomes in models which analyse the distribution of the treatment effect (and which control for selection on observable and unobservable characteristics). In particular, it is assumed that a linear latent index generates the outcome (see, in this respect, Aakvik *et. al.*, 2005).
23. If a variable influences only measure beneficiary status, there is no need to control for the differences between the treatment and the comparison group since the outcome variable of interest is unaffected. Conversely, if a variable influences only the outcome variable, there is no need to control for it since it will not be significantly different between the treatment and comparison groups. In addition, should a variable thought to influence outcomes perfectly predict participation, recipients would have a propensity score of 1 and non-recipients a propensity score of 0. In these instances, it may be difficult to get an unbiased estimate of programme impact using propensity score matching.
24. Where data do not contain all the variables influencing both participation and the outcome, CIA is violated, since programme effect will be accounted for in part by information which is not available to the evaluator.
25. For this reason, we have excluded one variable from the set of independent variables in the propensity score estimations that, in spite of being available for our analysis, is likely to be affected by participation: firm size. The fact that a disabled worker is benefited by some employment promotion measure is likely to allow his contracting firm to hire more workers, given the savings that this hiring may imply for the firm.

26. We are conscious of the fact that, doing this, high quality matches may be lost at the boundaries of the common support and the sample may be reduced (see Lechner, 2001). However, in our case, enforcement of the common support does not result in a loss of a sizeable proportion of the treated population. The number of individuals rejected is only 41, except in radius matching with common support and calliper = 0.005, where it accounts to 65.
27. Should a certain type of individual be common in the treatment group but relatively uncommon in the comparison group, the pool of comparators able to provide a close match would become exhausted in case that matching were carried out without replacement. This is the reason why the technique is only implemented with replacement in our analysis.
28. Blázquez and Malo (2005) analyze the influence of being disabled on educational mismatch using Spanish data of the ECHP and they conclude that disability has a non-significant impact on the mismatch.
29. See, for example, Benítez-Silva *et al.* (2004) for an extensive discussion about self-reported bias and endogeneity in disability research.

References

- Aakvik, A., Heckman, J. and Vytlačil, E. (2005), "Estimating the Treatment Effects for Discrete Outcomes When Responses to Treatment Vary: An Application to Norwegian Vocational Rehabilitation Programs", *Journal of Econometrics*, 125, 15-51.
- Abadie, A. and Imbens, G. (2002), "Simple and bias-corrected matching estimators for average treatment effects", University of California at Berkeley, mimeo.
- Agodini, R. and Dynarski, M. (2001), *Are Experiments the Only Option? A Look at Dropout Prevention Programs*, Mathematica Policy Research Inc., Princeton NJ.
- Baldwin, M.L. and Johnson, W.G. (1995), "Labor Market Discrimination against People with Disabilities", *Industrial Relations*, vol. 34 (4), 555-577.
- Becker, S.O. and Ichino, A. (2002), "Estimation of average treatment effects based on propensity scores", *The Stata Journal*, vol. 2, no. 4, pp. 358-377.
- Benítez Silva, H., Buchinsky, M., Chan, H.M., Cheidvasser, S. y Rust, J. (2004), "How large is the bias in self-reported disability?", *Journal of Applied Econometrics*, vol. 19, pp. 649-670.
- Blundell, R. and Costa Dias, M. (2000), *Evaluation methods for non-experimental data* Fiscal Studies 21(4).
- Blázquez, M. and Malo, M.A. (2005), "Educational Mismatch and Labour Mobility of People with Disabilities: The Spanish Case", *Revista de Economía Laboral*, vol. 2(1), 31-55. Available at <http://www.uniovi.es/Revistas/REL/Articulos.htm>
- Blundell, R. and MaCurdy, T. (1999), *Labour supply: a review of alternative approaches* in Ashenfelter, O. and Card, D. *Handbook of labor economics vol III*, Amsterdam.
- Blundell, R., Dearden, L. and B. Sianesi (2004), "Evaluating the Impact of Education on Earnings in the UK: Models, Methods and Results from the NCDS", The Institute for Fiscal Studies, WP 03/20.
- Bound, J. and Burkhauser, R.V. (1999), "Economic Analysis of Transfer Programs Targeted on People with Disabilities", chapter in O. Ashenfelter and D. Card, *Handbook of Labor Economics*, vol. 3, 3417-3528.

- Bryson, A., R. Dorsett and S. Purdon (2002), "The Use of Propensity Score Matching in the Evaluation of Active Labour Market Policies", Working Paper no. 4, Policy Studies Institute and National Centre for Social Research.
- Burtless, G. (1995), "The Case for Randomized Field Trials in Economic and Policy Research", *Journal of Economic Perspectives*, 9(2), 63-84.
- Caliendo, M. and Kopeinig, S. (2005), "Some Practical Guidance for the Implementation of Propensity Score Matching", IZA working papers, num. 1588.
- CES (2003), *La situación de las personas con discapacidad*, Consejo Económico y social, Colección Informes 4/2003, Madrid.
- Cochran, W. and Rubin, D.B. (1973), "Controlling bias in observational studies", *Sankhya*, 35, 417-56.
- Corden, A. and Thornton, P. (2002), *Employment programmes for disabled people: lessons from research evaluations*, Department for Work and Pensions In-house Report 90, Social Research Branch, Department for Work: London.
- Dehejia, R. and Wahba, S. (1998), *Propensity score matching methods for non-experimental causal studies*, NBER working paper 6829.
- Dehejia, R.H. and Wahaba, S. (1999), "Causal effects in non-experimental studies: re-evaluating the evaluation of training programmes", *Journal of American Statistical Association*, 94, 1053-62.
- Esteban, R. (1999), *Contrato de trabajo y discapacidad*, IBIDEM Ediciones, Madrid.
- Goldberger, A. (1983), *Abnormal selection bias* in Karlin, S., Amemiya, T. and Goodman, L. (eds.) *Studies in econometrics, time series and multivariate statistics*. New York: Academic Press.
- Heckman, J. (1995), *Instrumental Variables: A Cautionary Tale*, NBER Technical Working Paper No. 185, Cambridge, Mass.
- Heckman, J. and Smith, J. (1995), "Assessing the Case for Social Experiments", *Journal of Economic Perspectives* 9 (2) 85-100.
- Heckman, J. and Smith, J. (1999), "The pre-programme earnings dip and the determinants of participation in a social programme. Implications for simple programme evaluation strategies", *Economic Journal* 109: 313-348.
- Heckman, J., Ichimura, H., Smith, J. and Todd, P. (1998), "Characterizing selection bias using experimental data", *Econometrica* 66(5): 1017-1098.
- Heckman, J., Lalonde, R. and Smith, J. (1999), *The economics and econometrics of active labour market programs* in Ashenfelter, O. and Card, D. *Handbook of labor economics vol III*, Amsterdam.
- Imbens, G. (2004), "Semiparametric estimation of average treatment effects under exogeneity: a review", *Review of Economics and Statistics* 86, 4-29.
- INE (2001), *Encuesta sobre Discapacidades, Deficiencias y Estado de Salud 1999. Metodología*, Instituto Nacional de Estadística, Madrid.
- Jovanovic, B. (1979), "Job Matching and the Theory of Turnover", *Journal of Political Economy*, 87, 972-990.
- Kidd, M.P., Sloane, P.J., and Ferko, I. (2000), "Disability and the Labour Market: An Analysis of British Males", *Journal of Health Economics*, 19, 961-981.

- LaLonde, R. (1986), "Evaluating the Econometric Evaluations of Training Programs with Experimental Data", *American Economic Review*, 76(4), 604-620.
- Lechner, M. (2001), "A note on the common support problem in applied evaluation studies", Discussion Paper 2001-01, Department of Economics, University of St. Gallen.
- Leuven, E. and B. Sianesi (2003), "PSMATCH2: Stata Module to Perform Full Mahalanobis and Propensity Score Matching, Common Support Graphing, and Covariate Imbalance Testing", Software, <http://ideas.repec.org/c/boc/bocode/s432001.html>
- Livermore, G., Stapleton, D., Nowak, M., Wittenburg, D. and Eiseman, E. (2000), "The Economics of Policies and Programs Affecting the Employment of People with Disabilities", Cornell University. Available at: <http://www.ilr.cornell.edu/rrtc>
- Loprest, O., Rupp, K., and Sandell, S.H. (1995), "Gender, Disabilities and Employment in the Health and Retirement Study", *Journal of Human Resources*, 30 (supplement), 5293-5318.
- Malo, M. A. (2003), "Las personas con discapacidad en el mercado de trabajo español", *Revista del Ministerio de Trabajo y Seguridad Social*, 46, 99-126.
- Malo, M.A. and García-Serrano, C. (2001), "An Analysis of the Employment Status of the Disabled Persons Using the ECHP Data", report prepared for EIM on behalf of the European Commission DG V.
- Malo, M.A. y Rodríguez, S. (2000), "Centros Especiales de Empleo: una breve reflexión económica sobre los cambios recientes de la normativa", *Documentación Laboral*, 62, 181-193.
- Puhani, P. (2000), "The Heckman Correction for Sample Selection and Its Critique — A Short Survey", *Journal of Economic Surveys* 14, 53-68.
- Romero, M.J. (coord.) (2003), *Trabajo y protección social del discapacitado*, Editorial Bomarzo, Albacete.
- Rosenbaum, P.R. and D.B. Rubin (1983), "The central role of the propensity score in observational studies for causal effects", *Biometrika*, 70 (1), 41-55.
- Rubin, D. B. (1974), "Estimating Causal Effects of Treatments in Randomised and Non-randomised Studies", *Journal of Educational Psychology*, 66, 688-701.
- Rubin, D. B. (1977), "Assignment to a Treatment Group on the Basis of a Covariate", *Journal of Educational Statistics*, 2, 1-36.
- Sianesi, B. (2001), *An evaluation of the active labour market programmes in Sweden* Office of Labour Market Policy Evaluation (IFAU) working paper 2000: 5.
- Smith, J. (2000), "A critical survey of empirical methods for evaluating active labor market policies", Schweitz, *Zeitschrift für Volkswirtschaft und Statistik*, Vol. 136 (3), 1-22.
- Smith, J. and P. Todd (2005), "Does Matching Overcome Lalonde's Critique of Non Experimental Estimators?", *Journal of Econometrics*, 125, pp. 305-353.
- Zhao, Z. (2004), "Using matching to estimate treatment effects: data requirements, matching metrics, and Monte Carlo evidence", *Review of Economics and Statistics*, 86, 91-107.

Resumen

En este artículo se evalúa la influencia sobre la calidad del emparejamiento con el puesto de trabajo de las políticas de promoción de empleo y de los servicios de intermediación laboral para personas con discapacidad. Para ello utili-

zamos técnicas de análisis de *matching*. Nos centramos en dos aspectos de la calidad: el tipo de contrato (indefinido o temporal) y si el individuo busca o no empleo desde el empleo. Encontramos que los dos tipos de políticas no mejoran la calidad del emparejamiento con el puesto. También se discuten las implicaciones de política laboral de los resultados.

Palabras clave: Discapacidad, emparejamiento con el puesto, promoción de empleo, evaluación, análisis de *matching*, contrato indefinido, búsqueda de empleo desde el empleo.

Clasificación JEL: J480, J40, I120.

APPENDIX

Table A.1: ATT and ATE for individuals who pass through employment promotion measures

OUTCOME:	Matching method	ATT	ATE
Reaching a permanent contract	Nearest-neighbour matching method with replacement & common support	.0120 (.1086)	-.0487 (.1058)
	Radius matching with common support		
	Caliper 0.005	-.0587 (.1062)	-.0374 (.1287)
	Caliper 0.01	-.0164 (.0987)	-.0206 (.1021)
	Caliper 0.02	-.0251 (.0949)	-.0178 (.1050)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	-.0082 (.1059)	-.0168 (.1022)
	<i>Gaussian kernel</i>	.00006 (.1004)	-.0285 (.1101)
	<i>Biweight kernel</i>	-.0106 (.0967)	-.0163 (.1052)
	<i>Uniform kernel</i>	-.0104 (.1017)	-.0232 (.0999)
Searching for another job	Nearest-neighbour matching method with replacement & common support	0 (.0623)	-.0170 (.0435)
	Radius matching with common support		
	Caliper 0.005	.01179 (.0701)	-.0165 (.0529)
	Caliper 0.01	.0127 (.1033)	-.0197 (.0989)
	Caliper 0.02	.0015 (.1006)	-.0157 (.1070)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	-.0111 (.1034)	-.0105 (.1036)
	<i>Gaussian kernel</i>	-.0045 (.1044)	.0003 (.1077)
	<i>Biweight kernel</i>	-.0123 (.1031)	-.0123 (.1012)
	<i>Uniform kernel</i>	-.0065 (.1024)	-.0086 (.1015)

Note: The entries in brackets are the bootstrapped standard errors (500 replications).

Table A.2: ATT and ATE for men

OUTCOME:	Matching method	ATT	ATE
Reaching a permanent contract	Nearest-neighbour matching method with replacement & common support	-.0336 (.0815)	.0380 (.0815)
	Radius matching with common support		
	Caliper 0.005	.0279 (.1086)	.0948 (.1048)
	Caliper 0.01	-.0367 (.0956)	.0174 (.0897)
	Caliper 0.02	-.0482 (.0979)	.0137 (.0935)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	-.0829 (.0953)	-.0012 (.0952)
	<i>Gaussian kernel</i>	-.0856 (.0967)	-.0015 (.0848)
	<i>Biweight kernel</i>	-.07983 (.1028)	.0004 (.0852)
	<i>Uniform kernel</i>	-.0862 (.0991)	.0019 (.0823)
Searching for another job	Nearest-neighbour matching method with replacement & common support	.0168 (.0468)	.0543 (.0470)
	Radius matching with common support		
	Caliper 0.005	.0154 (.0683)	.0356 (.0883)
	Caliper 0.01	.02193 (.1013)	.0554 (.0887)
	Caliper 0.02	.0123 (.1007)	.0533 (.0889)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	.0105 (.0987)	.0507 (.0880)
	<i>Gaussian kernel</i>	.0117 (.0982)	.0399 (.0918)
	<i>Biweight kernel</i>	.00963 (.1021)	.0518 (.0891)
	<i>Uniform kernel</i>	.0117 (.1010)	.0434 (.0900)

Note: The entries in brackets are the bootstrapped standard errors (500 replications)

Table A.3: ATT and ATE for individuals under 53 years-old

OUTCOME:	Matching method	ATT	ATE
Reaching a permanent contract	Nearest-neighbour matching method with replacement & common support	-.0503 (.0956)	-.0831 (.1010)
	Radius matching with common support		
	Caliper 0.005	-.0140 (.0994)	-.0700 (.1188)
	Caliper 0.01	-.0381 (.0883)	-.0453 (.1093)
	Caliper 0.02	-.0643 (.1017)	-.0976 (.1035)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	-.0687 (.0920)	-.0983 (.1019)
	<i>Gaussian kernel</i>	-.0615 (.0946)	-.0459 (.1081)
	<i>Biweight kernel</i>	-.07050 (.0902)	-.1030 (.1056)
	<i>Uniform kernel</i>	-.0641 (.1040)	-.0833 (.1042)
Searching for another job	Nearest-neighbour matching method with replacement & common support	-.00719 (.0583)	-.0302 (.0426)
	Radius matching with common support		
	Caliper 0.005	-.0140 (.0631)	-.0247 (.0620)
	Caliper 0.01	-.0223 (.0920)	-.0366 (.0981)
	Caliper 0.02	-.0211 (.0950)	-.0201 (.1050)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	-.0137 (.0947)	.0005 (.1143)
	<i>Gaussian kernel</i>	-.0219 (.0973)	.0063 (.1067)
	<i>Biweight kernel</i>	-.0135 (.0959)	-.0056 (.1041)
	<i>Uniform kernel</i>	-.0176 (.0952)	.0198 (.1037)

Note: The entries in brackets are the bootstrapped standard errors (500 replications)

Table A.4: ATT and ATE for individuals without certificate of disability

OUTCOME:	Matching method	ATT	ATE
Reaching a permanent contract	Nearest-neighbour matching method with replacement & common support	-.0357 (.2090)	.0689 (.1402)
	Radius matching with common support		
	Caliper 0.005	.0209 (.3076)	.1820 (.2691)
	Caliper 0.01	.03728 (.2178)	.1471 (.1532)
	Caliper 0.02	-.0367 (.2202)	.1168 (.1464)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	-.0429 (.2075)	.0533 (.1557)
	<i>Gaussian kernel</i>	-.0136 (.2128)	.0646 (.1437)
	<i>Biweight kernel</i>	-.04212 (.2110)	.0582 (.1487)
	<i>Uniform kernel</i>	-.04406 (.2155)	.0544 (.1446)
Searching for another job	Nearest-neighbour matching method with replacement & common support	.0714 (.0940)	-.0114 (.0461)
	Radius matching with common support		
	Caliper 0.005	.0038 (.1864)	-.0588 (.1506)
	Caliper 0.01	.0160 (.2141)	-.0410 (.1441)
	Caliper 0.02	-.0401 (.2042)	-.0406 (.1464)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	.0221 (.1981)	-.0391 (.1367)
	<i>Gaussian kernel</i>	.033532577 (.2094641)	-.0477 (.1448)
	<i>Biweight kernel</i>	.0266 (.2128)	-.0338 (.1531)
	<i>Uniform kernel</i>	.0110 (.2170)	-.0469 (.1422)

Note: The entries in brackets are the bootstrapped standard errors (500 replications)

Table A.5: ATT and ATE for individuals suffering more than one disability

OUTCOME:	Matching method	ATT	ATE
Reaching a permanent contract	Nearest-neighbour matching method with replacement & common support	.0225 (.0985)	.0894 (.0751)
	Radius matching with common support		
	Caliper 0.005	.10752 (.0981)	.1143 (.0876)
	Caliper 0.01	.0215 (.0969)	.0719 (.0784)
	Caliper 0.02	.01908 (.0937)	.0889 (.0842)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	-.01685 (.0969)	.0557 (.05579)
	<i>Gaussian kernel</i>	-.01664 (.0953)	.03973 (.0795)
	<i>Biweight kernel</i>	-.01486 (.0936)	.06305 (.0785)
	<i>Uniform kernel</i>	-.01754 (.0975)	.0419 (.0772)
Searching for another job	Nearest-neighbour matching method with replacement & common support	-.06015 (.0458)	-.0298 (.0444)
	Radius matching with common support		
	Caliper 0.005	-.0971 (.0645)	-.0453 (.0545)
	Caliper 0.01	-.0556 (.0980)	-.0189 (.0805)
	Caliper 0.02	-.0380 (.0955)	-.0189 (.0787)
	Kernel matching with common support		
	<i>Epanechnikov kernel</i>	-.0083 (.0972)	-.0042 (.0799)
	<i>Gaussian kernel</i>	-.0079 (.0941)	.0131 (.0754)
	<i>Biweight kernel</i>	-.0098 (.0910)	-.0069 (.0801)
	<i>Uniform kernel</i>	-.0070 (.0958)	.0018 (.0780)

Note: The entries in brackets are the bootstrapped standard errors (500 replications)

Table A.6: Means and Standard Deviations in the sample of wage and salary workers with disabilities

Variable	All		Controls		Treated	
	Obs	Mean	Obs	Mean	Obs	Mean
Open-ended contract	975	0.72	786	0.73	189	0.67
Searching for another job	975	0.06	786	0.05	189	0.07
Only one disability	975	0.38	786	0.43	189	0.14
Official certificate of being disabled	975	0.33	786	0.21	189	0.82
Gender (1= Male)	975	0.67	786	0.65	189	0.75
Age	975	43.56 (11.98)	786	45.00 (11.67)	189	37.56 (11.40)
Civil Status (1=Married)	975	0.63	786	0.69	189	0.39
Head of the household (1=Yes)	975	0.60	786	0.63	189	0.49
Household size	975	3.66	786	3.67	189	3.64
Receiving any sort of benefit or subsidy (1=Yes)	975	0.23	786	0.16	189	0.51
Being a member of a non-profit organization related to disability	975	0.14	786	0.06	189	0.46
Vocational training courses (1=Yes)	975	0.16	786	0.14	189	0.25
Illiterate or without studies	975	0.13	786	0.12	189	0.17
Primary Level and Compulsory Secondary Level	975	0.57	786	0.56	189	0.61
Non-compulsory Secondary Level	975	0.08	786	0.08	189	0.08
Vocational Training	975	0.06	786	0.07	189	0.05
University or Postgraduate Studies	975	0.15	786	0.16	189	0.08
Region: South	975	0.20	786	0.20	189	0.19
Region: East Coast	975	0.25	786	0.24	189	0.27
Region: North Coast	975	0.16	786	0.16	189	0.17
Region: Ebro River	975	0.07	786	0.06	189	0.08
Region: Centre (Castilla and Madrid)	975	0.26	786	0.27	189	0.24
Region: Balearic and Canary Islands	975	0.06	786	0.07	189	0.05
Empl. Prom.: Training contract (1=Yes)	975	0.03	786	0.00	189	0.16
Empl. Prom.: Fiscal incentives for contracts	975	0.04	786	0.00	189	0.19
Empl. Prom.: Quota in the public sector	975	0.02	786	0.00	189	0.10
Empl. Prom.: Quota in the private sector	975	0.03	786	0.00	189	0.16
Empl. Prom.: Special help for re-entry in the labour market	975	0.01	786	0.00	189	0.05
Empl. Prom.: Subsidies	975	0.01	786	0.00	189	0.04
Empl. Prom.: Sheltered employment centres	975	0.05	786	0.00	189	0.28
Empl. Prom.: Beneficiary of any of the previous measures	975	0.18	786	0.00	189	0.91
User of specialized labour market intermediation (1=Yes)	975	0.09	786	0.00	189	0.48
Beneficiary of employment promotion measures or specialized labour intermediation	975	0.19	786	0.00	189	1.00

Source: EDDDES-1999 and authors' calculations. Standard deviations are in parentheses.

