# Do Public Employment Services help people in finding a job?
# An evaluation for Italy

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## Abstract

*The Luxembourg process placed strong emphasis on the reorganisation of the Public Employment Services (PES, henceforth) as essential contribution for a successful reform of labour market. In Italy the transformation of the PES from its traditional bureaucratic role towards modern services is going on but it is proceeding in a rather lengthy and difficult way. Being the reform process at an early stage, this paper explores the decision to enrol to the old PES and its effects in terms of job finding opportunities. The approach we present, applied at Labour Force Survey longitudinal data, may also help in the forthcoming future to evaluate the effectiveness of the PES reform.*

**Keywords:** Selection bias; Evaluation; Propensity score; Job matching.

## 1. Introduction[1]

The European Employment Strategy (the so called Luxembourg process launched at the end of 1997 by European Heads of State meeting in Luxembourg) has very much emphasised the role of the PES in implementing a preventive and proactive approach against long term unemployment. Such a solicitation is particularly demanding for a country like Italy, whose PES traditional role was mostly bureaucratic, e.g. the screening of new hires on the basis of the enrolment seniority. While those traditional duties have progressively become redundant, as a gradual liberalisation has interested hiring procedures (with a final abrogation of traditional "numeric hiring" in 1991 and further administrative simplifications in 1995), the transformation of the Italian PES into a modern services oriented network is proving a lengthy and difficult process.

An essential ingredient of this process is represented by PES decentralisation towards regional authorities[2]. While such decentralisation is part of a larger process of devolution from Central

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[1] An earlier version of this paper (circulated as ………) has also involved Giovanni Di Bartolomeo, to whom we are indebted for his excelllent co-operation.

Government to regional authorities, the principle of bringing PES governance closer to local labour market needs is deemed to be important in transforming PES *raison d'etre*.

As said the process is far from being completed and Italian PES is far from being able to fulfil the obligation to provide jobless people with a "new start" before 6 and 12 months, respectively for youths and adults, as stated in the European Employment Guidelines. More generally, Italy's labour market policies, both active and passive, are predominantly based on automatic procedures, with a rather scarce active involvement of the PES or other agencies.

This paper does not look at the efficacy of the reform, as the *new* PES still remains at a very preliminary stage. It concentrates on summarising what the old PES was, in terms of who its applicants were and what were the main effects, in terms of job finding opportunities, of its activities. This analysis, while inadequate to judge about the reform process itself, may provide useful information in order to better govern the reform process.

More precisely, we build upon some preliminary raw evidence we had already presented in a related paper (see Barbieri et al., 2000) and we look at the determinants of the probability of being a PES client, i.e. the probability of having enrolled to the PES, and the effect of such an event upon the probability of finding a job.

The plan of the paper is the following. Section 2 describes the main features of PES applicants and PES activities, as identified in our data sample, which is represented by the LFS conducted in July 1999. We also briefly describe the differences between our sample and the administrative statistics concerning PES clients, here unused because deemed to be unreliable. Section 3 examines the probability of registering with the PES. Section 4 describes our estimating strategy in order to link job chances and PES enrolment. The following three sections implement that strategy, looking at non employed, employed and some further subgroups within each of those two overall groups. Section 8 concludes.

## 2. PES clients and activities: some preliminary figures

In Italy there are two main data sources which provide useful information on PES registrants: an administrative count of the number of persons registered at the end of the reference month, with a breakdown in two classes[3], and the estimate provided by the quarterly Labour Force Survey (LFS), which includes a few questions directly asking to people whether they are registered to the PES.

We have chosen to resort to the LFS data for two reasons. Firstly, as we were interested in comparing who had enrolled to the PES with people who had not, we needed a source with the same information on both groups. The second and even more compelling reason is that the administrative source is deemed to be unreliable.

In particular, the administrative count of PES registrants at July 1999 was 1,1 million higher than the figure estimated in the LFS data here used. While there is the possibility that the individuals interviewed in the LFS do not recall whether they have registered to the PES, a more likely explanation of this difference relates to the fact that people are not promptly erased from PES registers. This may happen both when they have found a job (the cross check between registers and

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[2] As a consequence of decentralisation, around 70% of the PES personnel previously employed by the State was transferred to the regional authorities.

[3] Class 1a includes workers who have been registered following separation from a previous job while class 1b includes people seeking a first job.

the information coming from firms concerning new hires is made with long lags[4]) or when they have become uninterested to remain in the registers (during the period here examined, the PES local branches reviewed the labour market status of registered people around once per year).

Moreover the absence of updated and verified registers means that the information contained into them may be incorrect, particularly as for individuals' labour market status. While there are cases into which being employed allows to remain enrolled as job seekers into PES registers[5], it appears that many more employed individuals remain unlawfully registered to the PES. More generally, the fact that registered people are a much larger pool than the job seekers estimated by the LFS shows that many registered individuals are not unemployed according to the standard international (ILO) statistical criteria.

Therefore it has been common practice during the last decade to investigate who PES clients were by conducting ad hoc surveys - resembling common LFS practices and standards - on samples drawn from official PES registers (see Bassi et al., 2000). These studies had however two important drawbacks. First they were usually considering single areas within the country.  Second, they contained information only about PES registered people, lacking an immediate comparison with the individuals who had chosen not to enrol to the PES.

Our strategy of looking at PES clients as identified within the LFS allows to compare them to those individuals who have not enrolled to the PES and considers the whole country and not a given area. Moreover, the information on PES clients (and non clients) is quite standard and rich, as it is the normal information provided by the LFS, including that coming from the longitudinal features of the LFS. This latter, in particular, will allow to compare the job finding chances of PES clients and non clients, which is the focus of section 4. Before doing that, in section 3 we will examine the determinants of the decision of enrolling to the PES. In the remaining of this section instead we will present the raw figures concerning the PES as recovered from our data source.

The LFS contains standard information -  allowing *inter alia* to characterise an individual as employed, unemployed or not in the labour force - and a few questions specifically concerning the PES. In the survey we used, those of July and October 2000, the questions posed to the individuals were: whether he or she had registered to the PES, the time since he or she had been registered and whether the individual had received any concrete proposal (in terms of job referrals, offers of participation to training or public works schemes, consulting services) from the PES during the previous six months, for (ILO) unemployed people whether they had actively used the PES during the last month as part of their job-seeking activities[6].

We identified PES clients as those individuals who declared to have registered with the PES. Focusing only on individuals aged 15-64 years, table 1 presents the number of PES clients, as estimated in July 2000 LFS, broken down according to their labour market status[7]. The total number of PES clients is 5,1 millions (it was 5,6 millions one year before). We may note that around 900,000 are employed  and that, as better shown in our companion paper presenting more descriptive data

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[4] Particularly when  the hiring has taken place elsewhere and the firm has notified another PES agency, which has then to inform the PES agency where the individual was enrolled (the Sistema Informativo Lavoro (SIL) which should informatically connect PES agencies throughout Italy has not yet become operational).

[5] This is the case for some temporary and part time jobs.

[6] In the section concerning the PES the specific questions posed are the following: Q56 'Are you registered with the PES?'; Q57 'If yes, how many months passed since the last contact with the PES?'; Q58 'Do you receive any unemployment benefits?' After April 1999 questions 57 and 58 have been marginally changed: 'How long have you been registered with the PES?'; 'In the last six months. have you received job offers, proposals of participation to training courses or consulting services?'

[7] There are other 17,876 PES clients aged more than 64 years. Even including them the difference with the administrative count is about 1 million.

(see Barbieri et al., 2000), among these people a large part works part-time, has temporary job positions and is looking for another job.

Unemployed people, according the ILO criteria[8], are about two fifths (1,9 millions) of total registered people. It has to be noticed that not all the ILO unemployed are PES clients: in fact there are 500,000 unemployed people who have not registered to the PES. The remaining people are either individuals interested to find a job but seeking it rather inactively (800,000, about one fourth of total registered people) or individuals uninterested to find a job (1,5 million, about one fifth of total registered people).

So, while most of the PES clients are (even if vaguely) looking for a job (employed job seekers, ILO unemployed and less active unemployed), some of them are apparently registered only for reasons unrelated to labour market outcomes, i.e. because of some benefits they may derive from belonging to the PES registers. It has to be noticed that these benefits are not the standard unemployment benefits, rather underdeveloped in Italy[9], but local tax rebates, local public transports favoured fares, employment incentives which may accrue to long term unemployed (identified on the basis of PES enrolment duration) etc..

While leaving to Barbieri et al. (2000) for a wider presentation of raw figures differentiated along sex, age and geographical lines (all elements we will come back in the next section when estimating the probability of enrolling to the PES), table 2 reports some information on PES services to those clients. It appears that only 3,4% of registrants declares to have been contacted by PES. Of the 176.000 people contacted, approximately 36.9% received a job offer, 24.4% an offer to be engaged in public works schemes, 17.6% vocational guidance and consulting services and 21% an offer to participate to vocational training or re-qualification initiatives. It is interesting to notice, in terms of job offers, the importance of the private agencies that contacted 143.000 of PES registrants.


## 3. The determinants of PES enrolment

In this section, our focus is on the probability of the i-th individual of being registered with the PES. Let Yi be the binary choice variable that takes value 1 if the person is registered and 0 otherwise. Our basic model is of the form:

$$P(Y_i=1|X_i) = F(\alpha+\beta'X_i) \tag{1}$$

where $\alpha$ and $\beta$ are vectors of unknown parameters and $X_i$ a vector of determinants; $F$ denotes the cumulative standard normal distribution.

As we are also interested in examining the job finding chances of being a PES client - chances which are identified by looking at the labour market status three months later, as shown by the October 2000 LFS - we restricted our attention to the longitudinal sub-sample, made up by 90,654 individuals (about 80,000 working age individuals).

Broadly speaking the X vector should capture the incentives to enrol to the PES, including "taste shifts" as represented by standard socio-demographic characteristics. On practical grounds, besides the latter, we only have information concerning the labour market: either the labour market status, experiences and activities of the individual in it or variables characterising the local labour market and PES activities in it. Unfortunately we are not able to characterise the other incentives related to

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[8] People aged 15 and over that have not worked in the reference week, are immediately ready to work and have been actively looking for a job during the 30 days before the survey. Some of the concrete steps undertaken in order to be classified as active job seekers during the previous month refer to PES related activities. However, having enrolled to the PES in the past does not automatically imply that one is considered an active job seeker.

[9] For a description of the unemployment benefits system in Italy see Franco and Sestito (1995).

PES enrolment, as we do not know whether, for instance, the financial amount of the local taxes rebates granted to PES registered people in a given area (neither we know whether the specific individual have tax obligations which may be reduced through PES enrolment).

More specifically, the socio-demographic characteristics relate to SEX (a dummy variable equal to one for female), AGE (a set of dummies covering six age groups: 15-19, 20-24, 25-34, 35-44, 45-54, >54), educational levels (DEGREE, a set of dummy for four levels of education: primary, lower secondary, upper secondary and tertiary), household structure (FAM, a set of dummies representing the composition of the family: married couple without sons, married couple with one son, married couple with more than two sons, family different from the previous ones and singles) and individual position in the household (FAMPOS, reference person, spouse, son or relative or other cohabitant), whether an individual is an army conscript (MILSERV), whether an individual is a STUDENT (a dummy equal to one for individuals whose main status is that of student, irrespective of whether they are working, unemployed or not in the labour force). Beside these variables, we consider a dummy variable (FER) equal to one when at least one of the other household's members is employed, a dummy variable (FPESR) equal to one when at least one of the other household's members is enrolled to the PES and a continuous variable (SCHOOLEND), measuring how many years have passed since the individual has left the schooling system, as a proxy of his permanence in the labour market[10]. The presence of other people in the household enrolled to the PES should also have a positive impact as there is a commonality in the job search activities and channels used within the same group of people. Living in the same household with other employed people is expected to reduce the PES enrolment probability for at least two reasons: as other informal and maybe more fruitful ways of being informed about job chances and labour market prospects are available through them, because the household is likely to have higher living standards (we do not explicitly control for household disposable income, unavailable in the LFS) and the other economic benefits deriving from PES enrolment are less valuable.

As for the local labour market environment, we include a set of geographical dummies (AREA, a set of dummies for identifying North-East, Centre and the South, the North-West being considered in the constant) and several variables measured at provincial level (there are 103 provinces): the unemployment rate (UR, measured in percentage points using the whole sample July 1999 LFS data), the occurrence of proposals made by the PES (OFF, measured in the whole sample July 2000 LFS data and expressed as a share of active population), the shares in total dependent employment of agriculture and industry (respectively AGR and IND, again measured using LFS data) and a turnover index (TURN, measured by the ratio of gross hiring flows in July 1999, as recovered by Ministry of Labour data, and total dependent employment, as measured by LFS). The presumption is that the highest the unemployment rate the more likely is that individuals enrol to the PES, which after all may be instrumental to look for a job. A positive effect should also have the OFF variable, as an active presence of local PES agencies may provide for a stimulus to the demand of PES activities (a supply that creates its own demand effect[11]). A positive impact is also expected from AGR, as it is well known that the agricultural sector is the one where the PES tends most to be used as a recruiting channel (for evidence see Casavola and Sestito, 1995), while more ambiguous is the likely impact of IND. Positive is the expected sign of the TURN variable, as the higher the turnover (for

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[10] For people who are currently classified as students the variable is equal to zero. For the others we used a specific variable included in the LFS questionnaire (at what age you have completed the highest degree you got ?) correcting for the heaping effects which apparently characterise the answers. For people with no degree (or a degree lower than the "secondaria inferiore") we assumed that the potential age of entrance in the labour market had been at 16 years.

[11] In principle PES activities are endogenous and a whole supply and demand for services model should be estimated. However, the reactivity of PES proposals to the number of PES clients is likely to be rather scarce in the period under examination, as PES governance was mostly centralised and subject to bureaucratic rules.

given employment and unemployment figures) the more likely is that there are job chances to be exploited.

After some experiments with a model which lumped together employed and non employed people, with a control for the employment status, we decided to focus on three different groups. We consider a first sub-sample of employed people, a second sub-sample composed by ILO unemployed people and a third consisting of non labour force (or inactive).

The models differ from each other as for a few other variables concerning individual's role in the labour market. In the employed sub-sample equation, we include a set of dummies identifying if the individual was working as a permanent or a temporary employee, distinguishing between part time and full time contracts (PERMPT and PERMTF identify permanent contracts, respectively part time and full time, TEMPPT and TEMPFT do the same for temporary contracts). Self-employed are identified by two other dummies distinguishing between part timers and full timers (respectively SELFPT and SELFFT). TEMPFT is the reference group included in the constant. In the former equation the expected signs of the dummies related to the different typologies of jobs is connected with the idea that temporary and, to a lesser extent, part time job positions are more precarious than full time and permanent ones. Even apart from formal rules (some part time and temporary jobs lawfully allow to remain enrolled to the PES as job seekers), people holding those positions remain very much interested to look for a job and/or to exploit some incentives available for long term PES registered people.

Two out of the three models share a variable characterising individuals presence in the labour market: a dummy variable (SEARCH) which applies to both employed and inactive being equal to one whenever an individual is looking for a job, whatever is his or her labour market status. Our expectation is that people looking for a job, irrespective of their employment status, are more likely to apply to the PES, which is in any case a job searching channel[12].

For the ILO unemployed and inactive sub-groups[13], we include a dummy variable (WORKEXPER) equal to one for those people who had previous work experiences. Actually its expected sign is a bit ambiguous: on one hand we know that the PES recruiting role is important only for temporary job positions in sectors like agriculture, on the other hand, people with previous work experiences have alternative informational channels concerning the labour market and may have lower incentives to enrol to the PES. People with previous work experiences are further differentiated according to a set of dummy variables specifying the reasons of interruption of the previous work experience (provided that experience happened in the previous eight years). The first dummy (DISMISSAL) captures whether an individual left the job for dismissal or because his or her temporary contract had expired. A second dummy (RETIREM) identifies those who had left the job for retirement reasons, while a third dummy (LEFTOTHER) covers all other reasons (and actually includes those people who declare they had a previous work experience but eight years before, as the reference group included in the constant is made by people with no previous job experiences).

Tables 4, 5 and 6 present the estimates conducted separately for the three sub-samples. Most of the variables have similar effects in all samples, with however some interesting differences. For sake of brevity we start from the equations for the not labour force and ILO unemployed, then differentially presenting the other estimates.

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[12] This is almost tautological for non employed persons, as some of the search activities considered in order to be classified among the unemployed pool pertain to the contacts with the PES (not simply the enrolment to the PES, however). A similar impact has also to be expected for the employed persons.

13 In practice, the variables we include in the models are the same for the ILO unemployed and inactive sub-groups.

Among socio-demographic variables the most relevant factors appear to be those related to age and educational level. As for age there appears to be an inverted U shaped pattern, with a maximum of the enrolment probability for individuals in the 25-34 years bracket and a minimum for the most aged ones (55 and over). A similarly inverted U shaped pattern appears for the educational levels, with a maximum probability for high school graduates and a minimum for people with tertiary level of education. Not very marked effects have the variables singling out the family type and the position of the individual within the family and the sex dummy (whose sign is negative). Being a student increases the probability of enrolment, which is consistent with the idea that people enrol not because they are currently looking for a job but as a long run strategy, in order to obtain sufficient seniority in the lists.

As for geographical variables, while a minimum has to be found in the North-East, the maximum is not in the South but in the Centre. The high incidence of PES registrants in the raw data for South is mostly attributed by our estimates to the local labour market conditions: high unemployment and a sectoral composition of employment biased towards agriculture and against industry (whose coefficients are respectively positive and negative). A significant positive impact appears also for PES proposals. Positive but statistically insignificant is the coefficient of the turnover variable.

Among the other variables, the most sizeable effects are those related to having other people in the household already enrolled to the PES and being actively looking for a job. Our interpretation is that the use of the PES tends to spread over the same household and that, while being enrolled to the PES does not imply being actively searching for a job, enrolment is itself a manifestation of interest in looking for a job. Negative but statistically insignificant is the coefficient of FER, the dummy variable identifying those individuals who have at least one other household's member who is employed. Positive but statistically insignificant is the coefficient of WORKEXPER, while negative and statistically significant is the coefficient of SCHOOLEND, which we tend to interpret as a sign that PES enrolment is a strategy for people yet inexperienced of the labour market. A positive and sizeable impact has the dummy singling out those individuals whose previous job was a temporary one, while a negative coefficient appears for those ones who have left their previous job because they are retiring from the labour market.

Broadly speaking similar is the impact of socio-demographic characteristics in the employed sub-sample. Besides some minor differences - for instance the negative impact of being a male is larger and becomes statistically significant and the positive impact of being a student which becomes much more marked - the major differences concern age educational level effects. Apart from a small rise passing from the 15-19 age brackets to the 25-34 age brackets, the pattern is now more clearly declining. As for educational levels the pattern is now continuously declining.

No many differences emerge for the geographical variables (the impact of TURNOVER is positive and very low, while that of AGR is always positive but higher) apart from a different ranking among the four area dummies. Among non employed people the probability of enrolling to the PES reaches a maximum in the South (even after having taken into account the effect of the higher unemployment rate and agriculture incidence in the area).

Quite limited are also the differences as for the other variables (the coefficient of the SEARCH dummy is now smaller, but such an effect remains one of the most relevant ones). Across the different classes of employed people, the highest probability of enrolling to the PES is reached by temporary full timers employees. The minimum is represented by permanent part timers employees and by self employed full timers.

## 4. PES enrolment and employment outcomes: the general methodology

In understanding the effectiveness of the PES the relevant issue concerns its effect on employment chances of its clients. Needless to say, PES activities are multifaceted and measuring them would require to consider all of them. So, job search guidance and counselling has to be coupled and integrated with orientation to training and further educational activities, such an integration being duly emphasised in the reform process currently undergoing. Moreover, an effective PES has to show its usefulness to firms, as attracting firms' posting their own vacancies is a pre-requisite to any matching activity. However, the final yardstick in evaluating whether the PES is providing useful services to its clients is whether they are facilitated in finding a job.

In a previous work (see Casavola and Sestito, 1995), PES role had been examined by looking at the incidence of job matches arranged through the PES over total existing job positions i.e. examining the channels through which individuals (declare to) have found their current job. In this paper we evaluate the PES effect comparing the job chances of PES registered people ("treated people") to those of non registered ("untreated people" or "control units"). More precisely we analyse the employment probability in October 2000 in relation to the PES enrolment status three months earlier (i.e. as measured in the July 2000 LFS), exploiting the longitudinal nature of the LFS.

Both strategies may suffer from some limitations: Casavola and Sestito had to rely on retrospective data, subject to recall errors and to the arbitrariness of attributing the match-maker role to the PES or to other channels; in our paper, on the other hand, the PES role is identified only indirectly, by comparing the subsequent job chances of PES registered and non registered, with no direct information on the actual role the PES may have played in finding a job (people not enrolled in July might have found a job in October through the PES and people enrolled in July and who have found a job in October, might have obtained that job through channels unrelated to the PES). Furthermore, judging PES effectiveness in terms of being employed over a three months horizon may be an insufficient characterisation of PES activities and effects. A longer time horizon, over which examining frequency and duration of job spells, would be preferable in principle.

Nonetheless, comparing the job chances of PES clients and other people is the simplest and most direct way to gauge whether enrolling to the PES provide any boost to job-seekers' chances

The comparisons have been conducted separately for the same groups (employed, unemployed, inactive) considered in estimating the probability of being registered with the PES. For the employed people, being in the same status three months later mostly mean having maintained the former job position[14]; for the other two groups, the estimates concern a job finding probability.

As pointed out in the methodological literature on policy evaluation, the estimate of a causal effect obtained by comparing a treatment group with a non experimental group could be biased because of selection problems. The issue may be considered by looking at the following simultaneous two equations model, where the first equation refers to the decision the individual *i-th* makes in registering with the PES ($Y_{1i}= 1$ if registered, otherwise being equal to zero) and the second equation to the employment outcome ($Y_{2i}= 1$ if employed, otherwise being equal to zero):

$$Y_{1i} = \phi_1'X_{1i} + \varepsilon_{1i} \qquad\qquad (2a)$$

$$Y_{2i} = \phi_2'X_{2i} + Y_{1i}, + \varepsilon_{2i} \qquad\qquad (2b)$$

where:

$X_{1i}$ and $X_{2i}$ are the vectors of covariates; $\varepsilon_{1i}$ and $\varepsilon_{2i}$ are the stochastic components.

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[14] Although we will also look at the sub-group of people who have lost their previous job positions, for whom the estimates concern a re-employment probability.

In order to separately identify the effect of $Y_1$ and $X_2$ upon $Y_2$ problems may arise because inserting $Y_1$ into the equation may pick up the effect upon employment chances of the observables and the unobservables variables considered into the first equation. People who have registered to the PES are a selected group, incomparable to non registered individuals, from which they may differ systematically because of observables and unobservables characteristics possibly relevant upon the employment probability[15].

Ruling out an experimental approach, into which people are randomly assigned to PES branches, some being registered and others not[16], and given the nature of our data, we followed two different routes. Firstly we applied standard propensity score techniques in order to compare PES registrants to individuals who, while not enrolled to the PES, are similar in terms of observables affecting the likelihood of enrolling to the PES [17]. As this methodology provide unbiased estimates of the treatment effect only when the differences between treated and untreated units are entirely due to observables, we also estimated equation (2b) through instrumental variables techniques, so to purge from the possible correlation between unobservables across the two equations.

*The Propensity score matching method*

The estimation strategy commonly used in the literature in order to control for systematic differences is to divide the two samples into sub-groups that have similar distributions of covariates and then compare the treated and untreated units in each sub-group. However, this procedure becomes difficult if the covariates are high dimensional. The propensity score gives a solution to this problem being a scalar function of the covariates which summarises all the information contained in the vector of independent variables. The propensity score is the conditional probability of exposure to a particular treatment, given a vector of observed covariates. In our exercise the propensity score is defined as the probability of being registered with the PES, as estimated in the previous section.

After having sorted the data according to estimated propensity score, we pair together each individual in the treated group with an individual in the comparison group of not treated people. The criteria for finding the nearest possible match is the minimum distance of the propensity score between individuals of the two groups: more precisely, we fixed a minimum value under which all individuals belonging to the comparison group are matched. Therefore, it may happen that a treated person is matched with more than one single non treated. Conversely, it is possible that no control units are found; in this case the treated units are dropped from the sub-sample[18]. The matching algorithm consists in a standard iterative procedure for minimising the sum of squared distance from the propensity score value of each treated person.

Once data are matched, the employment probability of treated and untreated can be compared. In our work we have estimated the treatment effect calculating the difference in employment

[15] For a general survey of this kind of problems see Heckman, Robb (1985); Heckman, Hotz (1989); Friedlander, Greenberg and Robins (1997).

[16] In principle, one might considers a comparison of different areas of the country characterised by different degrees of presence of the PES. Such an approach might be useful in the future in order to evaluate the effectiveness of the reform process currently undergoing, as one might compare areas where the PES has been already reformed and others where PES branches have maintained their former bureaucratic features (with a caveat as being at the avantgarde or being the laggard in the reform process might well be correlated with the buoyancy of the local labour market).

[17] P. R. Rosenbaum and D. B. Rubin (1983): *The central role of the propensity score in observational studies for causal effects,* Biometrika, vol n. 70 (1).

[18] R. H Dehejia and S. Wahba (1998): *Propensity score matching methods for non-experimental causal studies,* NBER Working Papers, n.6829.

probabilities on the sub-sample of matched units without covariates (raw probability) and in a model where a set of relevant independent variables are included (estimated probability). In the latter case we considered the employment probability net of the effect of the covariates as estimated through a probit equation run on the whole sample (incluidng both registrants and non registered people)..

While we are here mostly interested in comparing the employment chances of treated and untreated people, examining the determinants of the probability of finding (or retaining) a job is intrinsically interesting. The estimates, as the related matching procedure, are conducted separately for the three samples already defined: ILO unemployed, employed and inactive persons.

For many aspects the covariates taken into account are the same already used in order to explain in the previous section the probability of enrolling to the PES apart form a few exclusions and additions, both made on prior grounds. As for the latter, we inserted the percentage change in total employment at the province level during the quarter under examination (VAREMP). As for the former, we excluded the dummy FPESR, which is equal to one when at least one of the other household's member is enrolled to the PES. Such an exclusion is reasonable both on prior grounds, as theer is no reason why such a variable should have an impact per se upon job chances and somehow supported by its insignificant role if inserted. Such an exclusion is also important as it will provide a way to identify ther PES effect when implementing the IV technique later on. As for the other covariates, we were rather parsimonious in dropping them because when implementing the IV estimates, whose proper aim is to solve for the correlation among unobservables in the two equations system before examined, the presence of a long list of observables may play a role similar to that here played by the propensity score matching.

In general, the impact of the several covariates is very much in line with our informed priors. As for socio-demographic characteristics, males, households' heads, middle aged and more educated individuals find more easily a job. Students are less likely to find a job, while the family structure is relevant only for the unemployed: heavier familiar responsibilities lower the expectations easing job-matching activities. Local labour market conditions are quite important: both the unemployment rate and the rise in employment have the expected impact (respectively negative and positive). Agricultural provinces and provinces with high turnover yield better chances to find a job for the inactive, while in these areas the employed have higher probability to lose their job. Previous work experiences increase the probability of finding a new job in the case of ILO unemployed and inactive, unless the former job has been lost because of retirement, familiar reasons, illness or to attend school and training courses. The duration of job search is negatively related to the job opportunities for the unemployed: the longer the spell of unemployment, the less is the probability of finding a job subsequently. Quite obviously, among the inactive those who are searching for a job (though not actively seeking in ILO terms) has the highest job chances, while the opposite is true among the employed (those more at risk of losing their current job being over-represented among those looking for a job).

*The Instrumental Variable method*

In the second experiment we use IV techniques in order to address the problem of selection due to unobservables. The model estimated for the probability of finding (or retaining) a job is the same already presented apart from the use of a linear probability specification instead of a probit and the insertion of a dummy referring to PES enrollment. The model is identified using FPESR as instruments for such a dummy..

Results for the second stage job finding equation are presented in table 15 For simplicity, in this exercise we considered a linear probability model instead of a logit specification, so that the IV technique has been implemented as a 2SLS.

## 5. Main results

In this paragraph we present the main results of our work separately for the three groups. Tables 10, 11 and 12 report the estimates obtained with the propensity score methodology for each of them. We consider both the total matched sample and the four quartiles obtained by ordering the observations on the basis of the propensity score. Table 13 shows the results of the IV experiment, comparing the coefficient of the OLS estimate (for the dummy referring to PES enrolment) to that of the IV estimates, which should purge from the bias resulting from the endogeneity of PES enrolment.

Starting with the unemployed, the most relevant group from the labour market policies point of view, it is necessary to note that the registered with the PES show lower chances to fill a vacancy in the basic comparison on the whole sample. Taking account of the influence of covariates through the propensity score the impact of the PES is still negative, but becomes smaller. This reduction can be explained considering that disadvantaged people, with lower employment chances, are also more likely to register with the PES: in fact, the higher the propensity score, the lower is the employment probability (generally speaking for both registered and unregistered people). Such a reduction is also confirmed in the propensity score exercise netting out from the direct impact of the covariates upon the employment probability. In this case the difference in the employment chances between registered and unregistered people actually ends up being slightly positive. Contradictory with this extreme result is however the result of the IV estimates. The coefficient of PES enrolment upon employment chances is negative in bioth the OLS and the IV estimates, the latter being of a much larger size in absolute value (even if the IV estimates turns out to be very imprecise, with a rather large standard error).

Turning out to inactive people, the starting point is that of an apparently higher probability of employment of PES enrolled people. The propensity score exercise seems to show that to a good extent such a positive effect is due to the observables affecting PES enrolment. The job finding probability rises with the propensity score for both registered and unregistered people, as the propensity score itself is, in this group, more related to the presence of some labour market attachment than to disadvantage factors. In terms of both raw probabilities and netting out from the direct impact of the covariates upon job finding chances the difference between registered and unregistered people remains positive but shrinks considerably. The direction of the change when taking account of the endogeneity of PES enrolment is also confirmed by the IV exercise. Actually the point estimates in this case become negative, even if one has to notice that the point estimates are rather imprecise on statistical grounds.

As to employed, the starting point is a sizable negative difference in the job-maintainance probability between registered and unregistered people. The propensity score exercise show that approximately one half of this difference is due to the heterogeneity between the two groups. By looking at the different quartiles is clear that, as for the unemployed, the employment probability is increasing with the propensity score for both registered and unregistered people. The reason is that the likelihood of enrolling to the PES is higher for the weakest and most precarious employed persons, whoa re also those most at risk of losing their current job. The fact that PES enrolment does not help in maintaining a job position is however also confirmed by the IV exercise. The point estimate is slightly smaller, in absolute value, that that obtained through OLS estimates, but the impact is still clearly negative.

Overall, the several exercises here conducted show that a good part of the difference in employment chances of PES registered and unregistered people are due to heterogeneity, as registered people are more likely to be disadvantaged workers, but also, in the case of inactive individuals, people somehow attached to the labour market. Even after taking account of this heterogeneity, the answer to the question whether PES enrolment boosts employment chances is predominantly negative. Only in the case of the inactive and neglecting the possible role of unobservables (i.e. by looking at the propensity score approach) the registered people appear to have a slightly larger employment probability.

## 6. Conclusions

In this paper we examined the determinants of PES enrolment and its likely impact upon job chances in the Italian context. Beside these issues, our estimates also provides for some useful information about the overall determinants of job chances.

As for the latter, several interesting aspects emerge. For the unemployed, besides the impact of some socio-demographic characteristics (males, households' heads, middle aged and more educated individuals find more easily a job, while students are less likely to find a job) of some interest are the provincial offers both public and private. The pattern is similar for the job maintenance chances of the employed, with an interesting difference as for the job turnover, which increases the employment chances of the non employed, while reducing the maintenance chances of the employed. Having previous work experiences increases the probability of finding a new job, unless the former job had been lost because of retirement, familiar reasons, illness or to attend school and training courses.

As for the impact of the PES status upon job chances, our extensive exercises are rather disappointing for the Italian PES. The results do not show any positive employment effects either on ILO unemployed and employed persons. The PES impact seems to be more positive only for inactive. However the results have to be treated with caution.

## References

Alulli, G.; and Botta, P. (2000), "Inclusione ed esclusione. Ritratto di una generazione di giovani alle soglie del 2000", Isfol, Strumenti e Ricerche, Milano, Franco Angeli.

Amendola, A; Caroleo, F. E.; and Coppola, G. (1999), "Differenziali territoriali nel mercato del lavoro e sviluppo in Italia" in STRUTTURA DELLA CONTRATTAZIONE, DIFFERENZIALI SALARIALI E OCCUPAZIONE IN AMBITI REGIONALI, Biaglili M.; Caroleo F.E.; and Destefanis S. (eds.), Esi, Napoli.

Barbieri, G.; Di Bartolomeo, G.; Gennari, P; and Sestito, P. (2000), "Chi sono gli utenti dei Servizi per l'Impiego?", Gruppo di lavoro per il monitoraggio degli interventi di politica occupazionale e del lavoro, O.M.L., Documenti Lavoro 1/2000.

Bassi, F.; Gambuzza, M.; Rasera, M.; and Rettore, E. (2000), "L'ingresso dei giovani nel mercato del lavoro: Prime esplorazioni dall'archivio Netlabor", *paper* presented at the Workshop on "Lavoro e disoccupazione: questioni di misura e di analisi", held in Bressanone.

Casavola, P.; and Sestito, P. (1995), "Come si cerca e come si ottiene un lavoro? Un quadro sintetico sull'Italia e alcune implicazioni macroeconomiche", in A. Amendola (eds.), "Disoccupazione, analisi macroeconomica e mercato del lavoro", Napoli, ESI.

Franco, D.; and Sestito, P. (1995), "Il sistema di protezione sociale dei disoccupati: Alcune riflessioni su una possibile riforma", *Politica Economica* 11: 389-412..

Friedlander, D.; Greenberg, D.H.; and Robins, P.K. (1997), "Evaluating Government Training Programs for the Economically Disadvantaged", Journal of Economic Literature 35: 1809-1855

Heckman, J.J.; and Hotz, V.J. (1989), "Choosing among Alternative Nonexperimental Methods for Estimating the Impact of Social Programs", *Journal of Amarican Statistical Association* 84: 862-74.

Heckman, J.J.; and Robb, R. Jr. (1985), "Alternative Methods for Evaluating the Impact of Intervention: An Overview", *Journal of Econometrics* 30: 239-67.

Holzer, H. J. (1988), "Search methods used by unemployed youth", *Journal of Labour Economics* 6: 1-20.

Kübler, D. (1999), "Coexistence of public and private job agencies: Screening with heterogeneous institutions", *Public Choice* 101: 85-107.

OECD (1999), "Methods of job-search by the unemployed in OECD countries", *paper* presented at the XVII° Working Party on employment and unemployment statistics, held in Paris.

Spence, M. (1973), "Job market signalling", *Quarterly Journal of Economics* 87: 355-74.

Spence, M. (1974), MARKET SIGNALLING, Cambridge University Press, Cambridge (Mass.).

Table 1: Characteristics of applicants for the PES

| Type of applicants | Number (000) | As % of Total | As % of corresp. pop. |
|---|---|---|---|
| Full time perm. Employees | 310 | 6.1 | 1.7 |
| Part time perm. Employees | 114 | 2.2 | 9.2 |
| Full time temp. Employees | 250 | 4.9 | 23.4 |
| Part time temp. Employees | 197 | 3.9 | 39.4 |
| Job seekers (ILO definition.) | 1,888 | 37.0 | 78.8 |
| NLF seeking less actively | 872 | 17.1 | 71.1 |
| NLF not looking for a job and willing to work | 554 | 10.8 | 27.3 |
| NLF not looking for a job and not willing to work | 922 | 18.1 | 7.6 |
| Total* | 5,125 | 100.0 | 13.2 |

*Included 17,876 persons aged >64


Table 2: Offers received by individuals registered with the PES

| Type of offer | Number (000) | As % of total |
|---|---|---|
| Participation to vocational training or re-qualification initiatives | 37 | 21.0 |
| Socially useful jobs | 43 | 24.4 |
| Job offers by PES | 65 | 36.9 |
| Vocational and consulting services offered by PES | 31 | 17.6 |
| Total | 176 | 100 |
| Job offers by private agencies | 143 | 44.8 |

## Table 3: Definition and summary statistics of variables

| Variable | Definition | OBS | MEAN | STD. DEV. | MIN | MAX |
|---|---|---|---|---|---|---|
| SEX | Dummy, takes value 1 if individual is male | 61846 | 0.4932898 | 0.499959 | 0 | 1 |
| FAM1 | Dummy, takes value 1 if individual is a single | 61845 | 0.0497049 | 0.2173364 | 0 | 1 |
| FAM2 | Dummy, takes value 1 if individual belongs to a married couple without sons | 61845 | 0.1073005 | 0.3094974 | 0 | 1 |
| FAM3 | Dummy, takes value 1 if individual belongs to a married couple with 1 son | 61845 | 0.2535856 | 0.4350667 | 0 | 1 |
| FAM4 | Dummy, takes value 1 if individual belongs to a married couple with more than 2 sons | 61845 | 0.4255477 | 0.4944298 | 0 | 1 |
| FAM5 | Dummy, takes value 1 if individual belongs to a family different from Fam1-Fam4 and single | 61845 | 0.1638613 | 0.3701526 | 0 | 1 |
| AREA1 | Dummy, takes value 1 if individual lives in Northwest | 61846 | 0.230508 | 0.4211614 | 0 | 1 |
| AREA2 | Dummy, takes value 1 if individual lives in Northeast | 61846 | 0.1870452 | 0.389951 | 0 | 1 |
| AREA3 | Dummy, takes value 1 if individual lives in Centre | 61846 | 0.185299 | 0.3885431 | 0 | 1 |
| AREA4 | Dummy, takes value 1 if individual lives in South | 61846 | 0.3971478 | 0.489311 | 0 | 1 |
| UR | Provincial unemployment rate | 61846 | 11.19725 | 8.743419 | 1.161614 | 30.5758 |
| TEMPFT | Dummy, takes value 1 if individual is a full time temporary employee | 61846 | 0.0295411 | 0.1693189 | 0 | 1 |
| TEMPPT | Dummy, takes value 1 if individual is a part time temporary employees | 61846 | 0.0135983 | 0.1158171 | 0 | 1 |
| PERMFT | Dummy, takes value 1 if individual is a full time permanent employees | 61846 | 0.3183391 | 0.4658356 | 0 | 1 |
| PERMPT | Dummy, takes value 1 if individual is a part time permanent employees | 61846 | 0.02026 | 0.1408895 | 0 | 1 |
| SELFPT | Dummy, takes value 1 if individual is a part time self-employed | 61846 | 0.0101057 | 0.1000189 | 0 | 1 |
| SELFFT | Dummy, takes value 1 if individual is a full time self-employed | 61846 | 0.1383921 | 0.3453139 | 0 | 1 |
| SEARCH | Dummy, takes value 1 if individual is looking for a job | 61846 | 0.133412 | 0.3400222 | 0 | 1 |
| SEARCH1 | Dummy, takes value 1 if individual employed is looking for another job | 61846 | 0.03573 | 0.18561 | 0 | 1 |
| AGE1 | Dummy, takes value 1 for individual aged 15-19 | 61846 | 0.0831743 | 0.2761478 | 0 | 1 |
| AGE2 | Dummy, takes value 1 for individual aged 20-24 | 61846 | 0.0955438 | 0.2939669 | 0 | 1 |
| AGE3 | Dummy, takes value 1 for individual aged 25-34 | 61846 | 0.2115254 | 0.4083933 | 0 | 1 |
| AGE4 | Dummy, takes value 1 for individual aged 35-44 | 61846 | 0.2160043 | 0.4115205 | 0 | 1 |
| AGE5 | Dummy, takes value 1 for individual aged 45-54 | 61846 | 0.2095366 | 0.4069812 | 0 | 1 |
| AGE6 | Dummy, takes value 1 for individual aged 55+ | 61846 | 0.1842156 | 0.3876631 | 0 | 1 |
| FAMPOS1 | Dummy, takes value 1 if individual is head of family | 61846 | 0.3669922 | 0.4819883 | 0 | 1 |
| FAMPOS2 | Dummy, takes value 1 if individual is a married partner | 61846 | 0.3044659 | 0.4601846 | 0 | 1 |
| FAMPOS3 | Dummy, takes value 1 if individual is a relative or son or cohabitant | 61846 | 0.3285419 | 0.4696868 | 0 | 1 |
| EXPERIENCE | Dummy, takes value 1 if individual has working experience | 61846 | 0.7279371 | 0.4450257 | 0 | 1 |
| STUDENT | Dummy, takes value 1 if individual is a student | 61846 | 0.1112441 | 0.3144367 | 0 | 1 |
| SCHOOLEND | Distance expressed in years of the highest education qualification achieved | 61846 | 23.77341 | 15.45562 | 0 | 89 |
| DEGREE1 | Dummy, takes value 1 for individual with primary level certificate or without any educational certificate | 61846 | 0.2123339 | 0.4089632 | 0 | 1 |
| DEGREE2 | Dummy, takes value 1 for individual with lower level certificate | 61846 | 0.3797174 | 0.4853204 | 0 | 1 |
| DEGREE3 | Dummy, takes value 1 for individual with upper secondary level certificate | 61846 | 0.3336837 | 0.471532 | 0 | 1 |
| DEGREE4 | Dummy, takes value 1 for individual with college degree | 61846 | 0.0742651 | 0.262204 | 0 | 1 |
| OFF1 | Number of provincial offers/Active population | 58501 | 7.02284 | 4.36197 | 0.788194 | 24.22749 |
| OFF2 | Number of provincial offers/Active population | 58501 | 7.02284 | 4.36197 | 0.788194 | 24.22749 |
| AGR | Employment in the agricultural sector/ Total employment | 61846 | 0.0644222 | 0.0476375 | 0.003624 | 0.205136 |

| | | | | | | |
|---|---|---|---|---|---|---|
| TURN | Gross hiring flow/ Total dependent employment | 61846 | 7.758573 | 5.989832 | 1.12061 | 44.50359 |
| FER | Dummy, takes value 1 if individual belongs to a family with more than one employee | 61846 | 0.6713935 | 0.4697104 | 0 | 1 |
| FPESR | Dummy, takes value 1 if individual belongs to a family with more than one person registered with the PES | 61846 | 0.2203053 | 0.4144558 | 0 | 1 |
| DISMISSAL | Dummy, takes value 1 if individual left the job because of dismissal | 61846 | 0.0300909 | 0.1708388 | 0 | 1 |
| RETIREM | Dummy, takes value 1 if individual left the job because of retirement | 61846 | 0.0575138 | 0.2328237 | 0 | 1 |
| LEFTOTHER | Dummy, takes value 1 if individual left the job because of familiar reasons, illness, inability or other reasons | 61846 | 0.0763348 | 0.2655351 | 0 | 1 |
| MILITARY | Dummy, takes value 1 if individual is doing military service or alternative to military service | 61846 | 0.0038806 | 0.062174 | 0 | 1 |

## Table 4: PES registration probability for non labour force

|  | Coefficient | s.e. | z | P> z |
|---|---|---|---|---|
| Constant | -1.7669 | 0.1207 | -14.6400 | 0.0000 |
| Male | -0.0160 | 0.0324 | -0.4900 | 0.6210 |
| Composition of the family |  |  |  |  |
| Married couple without sons | -0.0756 | 0.1061 | -0.7100 | 0.4760 |
| Married couple with 1 sons | -0.1585 | 0.0985 | -1.6100 | 0.1080 |
| Married couple with more than2 sons | -0.3382 | 0.0993 | -3.4100 | 0.0010 |
| Other family | -0.2871 | 0.0992 | -2.9000 | 0.0040 |
| Geographical area |  |  |  |  |
| North-East | -0.2471 | 0.0588 | -4.2100 | 0.0000 |
| Centre | 0.2861 | 0.0462 | 6.1900 | 0.0000 |
| South | -0.0042 | 0.0643 | -0.0700 | 0.9480 |
| Unemployment rate | 0.0249 | 0.0026 | 9.5900 | 0.0000 |
| In search | 1.4074 | 0.0396 | 35.5400 | 0.0000 |
| Age |  |  |  |  |
| 20-24 | 0.3341 | 0.0479 | 6.9800 | 0.0000 |
| 25-34 | 0.4420 | 0.0595 | 7.4300 | 0.0000 |
| 35-44 | 0.2923 | 0.0883 | 3.3100 | 0.0010 |
| 45-54 | -0.0532 | 0.1125 | -0.4700 | 0.6360 |
| 55+ | -0.3735 | 0.1409 | -2.6500 | 0.0080 |
| Position in the household |  |  |  |  |
| Married partner | -0.0958 | 0.0597 | -1.6000 | 0.1090 |
| Relative or son or cohabitant | 0.0739 | 0.0686 | 1.0800 | 0.2810 |
| Working experience | 0.0517 | 0.1697 | 0.3000 | 0.7610 |
| Student | 0.1298 | 0.0489 | 2.6600 | 0.0080 |
| Years from the highest degree | -0.0142 | 0.0032 | -4.4400 | 0.0000 |
| Educational level |  |  |  |  |
| Lower level certificate | 0.0754 | 0.0425 | 1.7700 | 0.0760 |
| Upper secondary level certificate | 0.2873 | 0.0512 | 5.6200 | 0.0000 |
| College degree | -0.0419 | 0.1004 | -0.4200 | 0.6760 |
| Number of provincial offers/Active population | 0.0029 | 0.0030 | 0.9600 | 0.3390 |
| Employment in the agr. Sector/Total employment | 0.9403 | 0.3248 | 2.9000 | 0.0040 |
| Gross hiring flow/Total dependent empl. | 0.0051 | 0.0026 | 1.9500 | 0.0510 |
| More than one employed in the family | -0.0160 | 0.0350 | -0.4600 | 0.6470 |
| More than one registered in the family | 0.7307 | 0.0295 | 24.7900 | 0.0000 |
| Reasons of interruption of the previous work experience |  |  |  |  |
| Left job because of dismissal | 0.9345 | 0.1762 | 5.3000 | 0.0000 |
| Left job because of familiar reasons, illness, inability or other reasons | 0.3329 | 0.1703 | 1.9500 | 0.0510 |
| Left job because of retirement | -0.9328 | 0.2255 | -4.1400 | 0.0000 |
| Military service | 0.0688 | 0.1122 | 0.6100 | 0.5400 |
| Pseudo R2 = | 0.3797 |  |  |  |

Table 5: PES registration probability for ILO unemployed

| | Coef. | Std. Err | z | P>\|z\| |
|---|---|---|---|---|
| Constant | -0.669 | 0.210 | -3.190 | 0.001 |
| Male | -0.020 | 0.062 | -0.330 | 0.745 |
| Composition of the family | | | | |
|    Married couple without sons | 0.115 | 0.172 | 0.660 | 0.506 |
|    Married couple with 1 sons | -0.050 | 0.149 | -0.330 | 0.739 |
|    Married couple with more than2 sons | -0.232 | 0.148 | -1.570 | 0.116 |
|    Other family | -0.120 | 0.152 | -0.790 | 0.430 |
| Geographical area | | | | |
|    North-East | -0.487 | 0.115 | -4.220 | 0.000 |
|    Centre | 0.255 | 0.100 | 2.560 | 0.010 |
|    South | 0.277 | 0.137 | 2.020 | 0.043 |
| Unemployment rate | 0.004 | 0.006 | 0.700 | 0.486 |
| Age | | | | |
|    20-24 | 0.529 | 0.100 | 5.270 | 0.000 |
|    25-34 | 0.621 | 0.119 | 5.240 | 0.000 |
|    35-44 | 0.738 | 0.164 | 4.500 | 0.000 |
|    45-54 | 0.588 | 0.219 | 2.690 | 0.007 |
|    55+ | 0.490 | 0.278 | 1.760 | 0.078 |
| Position in the household | | | | |
|    Married partner | -0.060 | 0.106 | -0.570 | 0.570 |
|    Relative or son or cohabitant | 0.157 | 0.098 | 1.600 | 0.109 |
| Working experience | -0.489 | 0.168 | -2.910 | 0.004 |
| Student | -0.130 | 0.106 | -1.220 | 0.221 |
| Years from the highest degree | -0.005 | 0.006 | -0.750 | 0.456 |
| Educational level | | | | |
|    Lower level certificate | 0.167 | 0.095 | 1.770 | 0.077 |
|    Upper secondary level certificate | 0.272 | 0.114 | 2.400 | 0.017 |
|    College degree | -0.104 | 0.166 | -0.630 | 0.530 |
| Number of provincial offers/Active population | 0.019 | 0.007 | 2.920 | 0.003 |
| Employment in the agr. Sector/Total employment | 2.075 | 0.694 | 2.990 | 0.003 |
| Gross hiring flow/Total dependent empl. | 0.003 | 0.006 | 0.520 | 0.600 |
| More than one employed in the family | 0.183 | 0.063 | 2.900 | 0.004 |
| More than one registered in the family | 0.640 | 0.061 | 10.550 | 0.000 |
| Reasons of interruption of the previous work experience | 0.806 | 0.168 | 4.790 | 0.000 |
|    Left job because of dismissal | 0.537 | 0.167 | 3.210 | 0.001 |
|    Left job because of familiar reasons, illness, inability or other reasons | 0.182 | 0.413 | 0.440 | 0.660 |
|    Left job because of retirement | 0.806 | 0.168 | 4.790 | 0.000 |
| Pseudo R2 = | 0.122 | | | |

Table 6: PES registration probability for employed

| | Coef. | Std. Err | z | P>\|z\| |
|---|---|---|---|---|
| Constant | -0.8145 | 0.1383 | -5.8900 | 0.0000 |
| Male | -0.0712 | 0.0431 | -1.6500 | 0.0990 |
| Composition of the family | | | | |
| Married couple without sons | -0.1934 | 0.0915 | -2.1100 | 0.0340 |
| Married couple with 1 sons | -0.2373 | 0.0776 | -3.0600 | 0.0020 |
| Married couple with more than2 sons | -0.3365 | 0.0816 | -4.1200 | 0.0000 |
| Other family | -0.2881 | 0.0849 | -3.4000 | 0.0010 |
| Geographical area | | | | |
| North-East | 0.1330 | 0.0566 | 2.3500 | 0.0190 |
| Centre | 0.1581 | 0.0533 | 2.9700 | 0.0030 |
| South | 0.3148 | 0.0789 | 3.9900 | 0.0000 |
| Unemployment rate | 0.0086 | 0.0034 | 2.5100 | 0.0120 |
| In search | 0.8012 | 0.0408 | 19.6500 | 0.0000 |
| | | | | |
| Temporary part time | 0.3396 | 0.0636 | 5.3400 | 0.0000 |
| Permanent full time | -1.0707 | 0.0458 | -23.3700 | 0.0000 |
| Permanent part time | -0.3180 | 0.0688 | -4.6200 | 0.0000 |
| Part time self-employed | -0.2801 | 0.0853 | -3.2800 | 0.0010 |
| Full time self-employed | -1.0140 | 0.0536 | -18.9000 | 0.0000 |
| Age | | | | |
| 20-24 | 0.0778 | 0.0986 | 0.7900 | 0.4310 |
| 25-34 | 0.0997 | 0.1018 | 0.9800 | 0.3280 |
| 35-44 | 0.0277 | 0.1235 | 0.2200 | 0.8230 |
| 45-54 | -0.1642 | 0.1479 | -1.1100 | 0.2670 |
| 55+ | -0.2196 | 0.1788 | -1.2300 | 0.2190 |
| Married partner | -0.0457 | 0.0579 | -0.7900 | 0.4300 |
| Relative or son or cohabitant | 0.0909 | 0.0531 | 1.7100 | 0.0870 |
| Student | 0.1533 | 0.1730 | 0.8900 | 0.3760 |
| Years from the highest degree | -0.0136 | 0.0038 | -3.5600 | 0.0000 |
| Educational level | | | | |
| Lower level certificate | -0.3039 | 0.0544 | -5.5900 | 0.0000 |
| Upper secondary level certificate | -0.4884 | 0.0630 | -7.7600 | 0.0000 |
| College degree | -0.6395 | 0.0934 | -6.8500 | 0.0000 |
| Number of provincial offers/Active population | 0.0116 | 0.0038 | 3.0300 | 0.0020 |
| Employment in the agr. Sector/Total employment | 1.2590 | 0.4230 | 2.9800 | 0.0030 |
| Gross hiring flow/Total dependent empl. | -0.0034 | 0.0033 | -1.0300 | 0.3050 |
| More than one employed in the family | 0.0246 | 0.0393 | 0.6300 | 0.5310 |
| More than one registered in the family | 0.7097 | 0.0383 | 18.5100 | 0.0000 |
| PseudoR2 | 0.3472 | | | |

Table 7: Employment probability for unemployed

| | Coefficient | s.e. | z | P> z |
|---|---|---|---|---|
| Constant | -0,883 | 0,356 | -2,480 | 0,013 |
| Male | 0,131 | 0,068 | 1,920 | 0,055 |
| Composition of the family | | | | |
| Married couple without sons | 0,202 | 0,203 | 1,000 | 0,319 |
| Married couple with 1 sons | 0,358 | 0,173 | 2,070 | 0,038 |
| Married couple with more than2 sons | 0,381 | 0,170 | 2,240 | 0,025 |
| Other family | 0,307 | 0,173 | 1,780 | 0,076 |
| Unemployment rate | -0,020 | 0,005 | -4,000 | 0,000 |
| % change of total employment | 0,033 | 0,019 | 1,710 | 0,087 |
| Age | | | | |
| 20-24 | 0,053 | 0,126 | 0,420 | 0,671 |
| 25-34 | -0,043 | 0,146 | -0,290 | 0,769 |
| 35-44 | 0,139 | 0,193 | 0,720 | 0,471 |
| 45-54 | 0,055 | 0,254 | 0,220 | 0,829 |
| 55+ | -0,253 | 0,332 | -0,760 | 0,445 |
| Position in the household | | | | |
| Married partner | -0,523 | 0,117 | -4,470 | 0,000 |
| Relative or son or cohabitant | -0,292 | 0,107 | -2,740 | 0,006 |
| Working experience | 0,315 | 0,186 | 1,700 | 0,090 |
| Student | -0,643 | 0,152 | -4,220 | 0,000 |
| Years from the highest degree | -0,003 | 0,007 | -0,350 | 0,725 |
| Educational level | | | | |
| Lower level certificate | 0,136 | 0,107 | 1,270 | 0,204 |
| Upper secondary level certificate | 0,182 | 0,127 | 1,430 | 0,153 |
| College degree | 0,462 | 0,185 | 2,500 | 0,013 |
| Duration of job search | | | | |
| 0-6 months | -0,340 | 0,282 | -1,200 | 0,228 |
| 7-12 months | -0,535 | 0,285 | -1,880 | 0,060 |
| >12 months | -0,874 | 0,280 | -3,120 | 0,002 |
| Number of provincial private offers/Active population | 0,012 | 0,007 | 1,710 | 0,087 |
| Number of provincial public offers/Active population | 0,009 | 0,004 | 2,330 | 0,020 |
| Employment in the agr. Sector/Total employment | 0,242 | 0,672 | 0,360 | 0,719 |
| Gross hiring flow/Total dependent empl. | 0,007 | 0,006 | 1,190 | 0,235 |
| More than one employed in the family | -0,060 | 0,070 | -0,860 | 0,392 |
| Reasons of interruption of the previous work experience | | | | |
| Left job because of dismissal | 0,184 | 0,177 | 1,040 | 0,297 |
| Left job because of familiar reasons, illness, inability or other reasons | -0,127 | 0,181 | -0,700 | 0,485 |
| Left job because of retirement | 0,099 | 0,654 | 0,150 | 0,879 |
| Pseudo R2 = | 0,140 | | | |

## Table 8: Employment probability for non labour force

|  | Coefficient | s.e. | z | P> z |
|---|---|---|---|---|
| Constant | -2,142 | 0,148 | -14,430 | 0,000 |
| Male | 0,241 | 0,044 | 5,470 | 0,000 |
| Composition of the family |  |  |  |  |
| Married couple without sons | 0,089 | 0,107 | 0,840 | 0,403 |
| Married couple with 1 sons | 0,036 | 0,104 | 0,340 | 0,732 |
| Married couple with more than2 sons | 0,095 | 0,105 | 0,900 | 0,366 |
| Other family | 0,164 | 0,104 | 1,580 | 0,115 |
| Unemployment rate | -0,011 | 0,003 | -3,910 | 0,000 |
| % change of total employment | 0,043 | 0,010 | 4,360 | 0,000 |
| Age |  |  |  |  |
| 20-24 | 0,115 | 0,070 | 1,660 | 0,098 |
| 25-34 | 0,210 | 0,083 | 2,530 | 0,012 |
| 35-44 | 0,185 | 0,114 | 1,630 | 0,103 |
| 45-54 | -0,070 | 0,146 | -0,480 | 0,631 |
| 55+ | -0,334 | 0,175 | -1,900 | 0,057 |
| Position in the household |  |  |  |  |
| Married partner | -0,165 | 0,066 | -2,520 | 0,012 |
| Relative or son or cohabitant | 0,076 | 0,072 | 1,040 | 0,297 |
| Working experience | 0,351 | 0,159 | 2,210 | 0,027 |
| Student | -0,304 | 0,064 | -4,770 | 0,000 |
| Years from the highest degree | -0,001 | 0,004 | -0,140 | 0,888 |
| Educational level |  |  |  |  |
| Lower level certificate | 0,069 | 0,052 | 1,340 | 0,180 |
| Upper secondary level certificate | 0,140 | 0,064 | 2,200 | 0,028 |
| College degree | 0,411 | 0,102 | 4,020 | 0,000 |
| Duration of job search |  |  |  |  |
| 0-6 months | 2,043 | 0,328 | 6,230 | 0,000 |
| 7-12 months | 1,437 | 0,372 | 3,860 | 0,000 |
| >12 months | 0,435 | 0,272 | 1,600 | 0,110 |
| Number of private provincial offers/Active population | 0,003 | 0,004 | 0,650 | 0,514 |
| Number of public provincial offers/Active population | 0,004 | 0,002 | 2,220 | 0,027 |
| Employment in the agr. Sector/Total employment | 1,226 | 0,383 | 3,200 | 0,001 |
| Gross hiring flow/Total dependent empl. | 0,008 | 0,002 | 3,290 | 0,001 |
| More than one employed in the family | 0,029 | 0,044 | 0,650 | 0,514 |
| Reasons of interruption of the previous work experience |  |  |  |  |
| Left job because of dismissal | 0,408 | 0,163 | 2,500 | 0,012 |
| Left job because of familiar reasons, illness, inability or other reasons | -0,203 | 0,158 | -1,290 | 0,199 |
| Left job because of retirement | -0,394 | 0,164 | -2,400 | 0,017 |

| | Coefficient | s.e. | z | P> z |
|---|---|---|---|---|
| Military service | 0,111 | 0,123 | 0,900 | 0,370 |
| Pseudo R2 = | 0,112 | | | |

## Table 9: Employment probability for employed

| | Coefficient | s.e. | z | P> z |
|---|---|---|---|---|
| Constant | 0,341 | 0,123 | 2,770 | 0,006 |
| Male | 0,209 | 0,040 | 5,220 | 0,000 |
| Composition of the family | | | | |
| Married couple without sons | 0,090 | 0,085 | 1,060 | 0,291 |
| Married couple with 1 sons | 0,109 | 0,076 | 1,440 | 0,150 |
| Married couple with more than2 sons | 0,084 | 0,076 | 1,120 | 0,265 |
| Other family | 0,059 | 0,079 | 0,750 | 0,453 |
| | | | | |
| Temporary part time | 0,025 | 0,071 | 0,360 | 0,719 |
| Permanent full time | 0,680 | 0,048 | 14,230 | 0,000 |
| Permanent part time | 0,591 | 0,084 | 7,040 | 0,000 |
| Part time self-employed | -0,089 | 0,083 | -1,070 | 0,284 |
| Full time self-employed | 0,464 | 0,052 | 9,000 | 0,000 |
| Unemployment rate | -0,013 | 0,002 | -5,740 | 0,000 |
| % change of total employment | 0,044 | 0,008 | 5,240 | 0,000 |
| Age | | | | |
| 20-24 | 0,781 | 0,076 | 10,330 | 0,000 |
| 25-34 | 1,076 | 0,081 | 13,320 | 0,000 |
| 35-44 | 1,313 | 0,105 | 12,560 | 0,000 |
| 45-54 | 1,307 | 0,132 | 9,900 | 0,000 |
| 55+ | 0,754 | 0,158 | 4,780 | 0,000 |
| Position in the household | | | | |
| Married partner | -0,248 | 0,052 | -4,730 | 0,000 |
| Relative or son or cohabitant | -0,275 | 0,049 | -5,610 | 0,000 |
| Student | -1,136 | 0,142 | -7,990 | 0,000 |
| Years from the highest degree | -0,005 | 0,004 | -1,330 | 0,184 |
| Educational level | | | | |
| Lower level certificate | 0,164 | 0,048 | 3,380 | 0,001 |
| Upper secondary level certificate | 0,301 | 0,058 | 5,200 | 0,000 |
| College degree | 0,415 | 0,087 | 4,750 | 0,000 |
| Search of another job | -0,375 | 0,047 | -7,960 | 0,000 |
| Number of provincial private offers/Active population | -0,005 | 0,004 | -1,450 | 0,147 |
| Number of provincial public offers/Active population | 0,001 | 0,002 | 0,530 | 0,599 |
| Employment in the agr. Sector/Total employment | -0,560 | 0,365 | -1,530 | 0,126 |
| Gross hiring flow/Total dependent empl. | -0,006 | 0,002 | -2,860 | 0,004 |
| More than one employed in the family | 0,016 | 0,035 | 0,460 | 0,643 |
| Pseudo R2 = | 0,1816 | | | |

## Table 10 - ILO unemployed

| Quartile | Propensity score | N. of registered | N. of non registered | Raw employment probability of registered | Raw employment probability of non registered | Difference in raw employment probability | Difference in employment probability net of covariates' effects |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | | | | Matched data | | | |
| 1 | 0.5904 | 280 | 202 | 0.1560 | 0.1801 | -0.0241 | 0.0022 |
| 2 | 0.7561 | 414 | 157 | 0.1308 | 0.1342 | -0.0035 | 0.0052 |
| 3 | 0.8369 | 489 | 130 | 0.1149 | 0.0908 | 0.0241 | 0.0180 |
| 4 | 0.9177 | 567 | 101 | 0.0907 | 0.1688 | -0.0781 | 0.0605 |
| Total | 0.7747 | 1750 | 590 | 0.1232 | 0.1434 | -0.0202 | 0.0097 |
| | | | | Unmatched data | | | |
| Total | 0.8008 | 2,890 | 719 | 0.1143 | 0.1553 | -0.0410 | -0.0306 |

## Table 11 – Inactive

| Quartile | Propensity score | N. of registered | N. of non registered | Raw employment probability of registered | Raw employment probability of non registered | Difference in raw employment probability | Difference in employment probability net of covariates' effects |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | | | | Matched data | | | |
| 1 | 0.02153 | 154 | 3189 | 0.00849 | 0.02773 | -0.01924 | -0.02434 |
| 2 | 0.09717 | 401 | 2188 | 0.05954 | 0.03481 | 0.02473 | 0.02273 |
| 3 | 0.20970 | 601 | 1416 | 0.05630 | 0.03956 | 0.01674 | 0.01527 |
| 4 | 0.51615 | 747 | 758 | 0.07832 | 0.06831 | 0.01002 | 0.01723 |
| Total | 0.20972 | 1903 | 7551 | 0.05051 | 0.04248 | 0.00803 | 0.00874 |
| | | | | Unmatched data | | | |
| Total | 0.15231 | 3,226 | 20,019 | 0.0782 | 0.0310 | 0.0472 | 0.0304 |

## Table 12 - Employed

| Quartile | Propensity score | N. of registered | N. of non registered | Raw employment probability of registered | Raw employment probability of non registered | Difference in raw employment probability | Difference in employment probability net of covariates' effects |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | | | | Matched data | | | |
| 1 | 0.00502 | 51 | 6,528 | 0.98563 | 0.98383 | 0.00180 | 0.00145 |
| 2 | 0.01609 | 123 | 5,307 | 0.84969 | 0.96899 | -0.11930 | -0.11827 |
| 3 | 0.06169 | 286 | 2,436 | 0.82975 | 0.95989 | -0.13014 | -0.13245 |
| 4 | 0.26387 | 392 | 651 | 0.82053 | 0.83523 | -0.01470 | -0.01790 |
| Total | 0.08712 | 852 | 14,922 | 0.87117 | 0.93672 | -0.06555 | -0.06676 |
| | | | | Unmatched data | | | |
| Total | 0.04574 | 1,438 | 29,808 | 0.8380 | 0.9651 | -0.1272 | -0.0884 |

**Table 13**

|  | Coeff. | Std. Err | z | P>|z| |
|---|---|---|---|---|
| **Inactive** |  |  |  |  |
| OLS Estimate | 0.0162 | 0.0047 | 3.45 | 0.001 |
| IV Estimate | -0.0123 | 0.0185 | -0.66 | 0.507 |
| **Employed** |  |  |  |  |
| OLS Estimate | -0.0548 | 0.0104 | -5.250 | 0.000 |
| IV Estimate | -0.0409 | 0.0466 | -0.880 | 0.380 |
| **Unemployed** |  |  |  |  |
| OLS Estimate | -0.013 | 0.015 | -0.850 | 0.396 |
| IV Estimate | -0.123 | 0.078 | -1.570 | 0.117 |