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ABSTRACT

An Impact Assessment of ESF Training Courses for Unemployed in the Province of Bolzano*

This paper evaluates the impact on employment probabilities of two training programs funded by the European Social Fund in the province of Bolzano, Italy. The programs were addressed to particularly vulnerable groups which were much less skilled and educated than the control group from the public employment agency registers. A large share of the benefit recipients are indeed recent migrants, refugees, and women. By using different matching algorithms, this group was made as similar as possible to the control group, at least in terms of observed characteristics, including the employment status up to two years before entering the programme. We find that the short-term impact of the training programs is negative, highlighting the presence of a lock-in effect. However, from the start of the programs, up to the 13th month, this effect reduced to zero. The effect is particularly sizeable and statistically significant for women, migrants, and the highly educated; age does not seem to matter. However, our findings suggest that the programs were especially significant in empowering women and migrants. By providing them with basic skills, including linguistic and technical professional skills, increased their integration by making them seek jobs more actively.

JEL Classification: D04, J08, J13, J18, J48

Keywords: active labour market policies, European Social Fund, training, impact evaluation, matching

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Introduction

This study analyses the employment effects of training courses for unemployed people financed by the Autonomous Province of Bolzano, Italy through the European Social Fund (ESF), under the Axes I: "Employment" and II: "Social Inclusion" of the ESF Operational Programme (OP). Between 2017 and 2019 the interventions were financed for about €12 million for Axis I and €5 million for Axis II. The training courses are intended to facilitate integration into the labour market of various categories of unemployed (Axis I) and vulnerable people (Axis II).

The study focuses on training courses launched within the first half of 2020 and analyses the employment effects up to 13 months after start-up. To this end, we used a counterfactual methodology, namely propensity score matching (PSM)[1]. We also used the Mahalanobis distance matching procedure to select the control group as a robustness check. The latter approach is more rigorous as it selects only individuals in the control group who are identical in terms of observed characteristics to the target group. The control group was extracted among those who, though registered as unemployed to the Public employment services (PESs) in the same period under analysis, had never benefited from any measure funded under the ESF programme.

We based our analysis on the monitoring data of the programme and administrative data on compulsory communications (*Comunicazioni obbligatorie* or COBs) that employers send to employment offices whenever a labour contract is started, discontinued, or modified, with the latter providing information on outcome variables. The database contains a wealth of information on the individual characteristics of the beneficiaries as well as the previous employment experience for both the treated and control group[2]. . The study regards 979 people, of which 615 were involved within the Axis I and 364 within the Axis II. The control group is large and composed of 61,786 cases.

The paper will be framed in a new but quickly expanding stream of the literature on policy evaluation in Italy, which we will shortly review in the relative section. We add to this literature by adding the Bolzano case and providing important information on the impact of training programs on the employment chances of refugees and migrants in the country. The data collected for this study is unique and was never available before. Considering recent literature (Caliendo et al., 2017), we control for omitted heterogeneity by exploiting the information on employment probabilities up to 2 years before the intervention. We found small positive effects on the employment probability. However, these effects were not statistically significant for either the courses under Axis I or the courses under the Axis II of the programme, except for some subgroups of the treated, namely women and migrants.

The remainder of this article is organized as follows. Section two describes the main characteristics of the ESF courses. Section three reviews the previous literature on active labour policy. The following two sections discuss methodology and data. Section six presents the descriptive analyses and section seven discuss the quality of matching procedures. Section eight presents the impact analysis results. Some concluding remarks follow.

The characteristics of the ESF courses

Axis I projects were funded through two open calls launched between 2017/2018 and 2018/2019, aimed

[1] We also interviewed three training institutions that have implemented a large number of training courses (they absorbed about half of the total participants of Axis I and almost 70% of the participants of Axis II), with the aim of better understanding the process of contact, adhesion and selection of participants.

[2] The Province of Bolzano's offices made the data available in anonymous format

at reaching different targets (young people, women, immigrants, long-term unemployed, older workers). The training courses focus on technical and soft skills and include an internship within a company, that is to say, concrete contacts with the world of work. The courses last for a maximum of 200-250 days and do not exceed 700 hours of training. The selection of courses was undertaken by a provincial commission, while enrolment and selection of the participating individuals were carried out by the beneficiary bodies responsible for providing the training.

Axis II projects were aimed at a wide range of vulnerable people. It should be noted that the conditions of vulnerability required for course admission in Axis II interventions (for example, the condition of disability or being homeless), make it more complicated. This is due to the difficulty of identifying a potential control group of unemployed people with the same vulnerable characteristics from the available data. Much of this information is "sensitive" and therefore subject to privacy restrictions. However, as we will see below, the type of vulnerability mostly covered by Axis II is related to being a foreigner. Axis II projects included training and guidance measures. Unlike Axis I projects, Axis II projects did not have to include an internship, although, in the interviews with training institutions, it was pointed out that a large majority of participants in the courses had some type of internship in a company. Axis II projects could have a longer duration, up to 1500 hours of training (project duration) over a period of up to 600 days. The modalities are the same as those used for Axis I projects with the selection process.

All three training organizations interviewed pointed out that the enrolment of potential participants in ESF courses, especially for Axis I, took place mostly as a result of a wider communication strategy, based on different channels, ranging from the most informal to the most formal: word of mouth, social networks, publications in various forms, various forms of advertising, and specific channels activated thanks to the networks of enterprises. Regarding Axis II, the training organisations underline that communication and information actions were insufficient to activate and mobilize the people concerned (vulnerable subjects, especially immigrants). Therefore, on the issue of immigration, all the bodies have activated different links with relevant territorial actors such as Caritas, non-profit organizations, and territorial centres for migrants, which "informed and urged" people to participate in ESF courses. The three training bodies also underlined that they had used written tests supplemented by interviews aimed at verifying different elements in the selection process. These included participants' characteristics and starting competencies, the practical possibility of attending the ESF courses, the motivational effect of the course contents, and the correspondence between the competencies and the expected professional figures or outgoing skills provided by the ESF courses.

The above shows that entry to the ESF courses took place based on a process of self-selection by people, especially on Axis I, and a selection process by the institutions which not only aimed at selecting the people with the greatest potential to find a job but instead on the consistency between the potential participants and the contents of the training courses. To have systematic differences with the control group, the ESF target group was not selected randomly. That is why we have used as many observable variables as possible in the phase of matching the treated with the non-treated, as will be better said later.

Finally, the interviewed organisations pointed out that the Axis II's interventions required more time for coaching and orientation activities. A further element underlined is that although the internship experience was not mandatory in the Axis II projects, all training centres have provided it to the majority of participants. The main reason is that it is believed that, given the greater "weakness" of the recipients of Axis II projects, the practical phase and contact with the world of work is even more important than for the recipients of Axis I. In terms of training content, the differences between Axis I and II projects are mainly linked to the fact that, given the substantial weight of migrants in Axis II projects, the teaching of the Italian/German language has been much more central in the training modules of the projects of this Axis than in those of Axis I. Overall, the content of training courses was of a higher level (in terms

for example of levels of European Qualification Framework) in the case of Axis I than in Axis II courses.

Literature Review

At the international level, the number of existing studies on the effects of labour policies using counterfactual approaches is quite high and often with mixed results. Nevertheless, some meta-analyses have allowed to bring out elements common to the different studies.

Kluve (2010) analyses 137 studies on the effects of active labour policies carried out in 19 European countries between the 80s and early 2000s. The study finds that employment incentive programmes and personal services (job-search assistance, penalties for non-compliance with the principle of conditionality) are more effective than training, while direct job creation by public institutions is associated with less positive outcomes. Moreover, programmes explicitly targeting young people are, on average, less effective.

Card & al. (2010) analysed 97 evaluation studies carried out between 1995 and 2007 in European and non-European countries. According to this research, both classroom and on-the-job training interventions tend to have negative or insignificant short-term results (up to a year from the end of the interventions). However, such programs have long-term positive effects (in line with what are called lock-in effects). As in Kluve (2010), the authors find that over the short-term, job search assistance and support programs are more effective than training programs and that public sector job creation programs generally have no negative effects. There are no substantial differences between the performance of long-term and short-term programmes, just as there are no gender-differentiated effects; interventions aimed at young people tend to have fewer positive effects than "generalist" programs.

By considering over 200 evaluations carried out from 2007 onwards, the same authors, Card & al. (2018), extended the previous meta-analysis of 2010. Several results of the previous study are confirmed, in particular, that the positive effects tend to manifest themselves more in the medium to long term, except for soft assistance programs of to the person in search for work and other support services, which tend to have positive effects even in the short term. Unlike the previous study, in this study, effects vary between subgroups: they are more favourable for women and the long-term unemployed (not very long) and less favourable for young people and unemployed adults. Finally, it would seem that active labour market policy programmes are more effective during economic crises than in periods of economic expansion, especially those with strengthened training and skills.

Another recent work by Vooren & al. (2018) focuses on 57 studies carried out with experimental or quasi-experimental methods between 1990 and 2017. The authors find that no type of labour policy shows positive effects up to six months after the intervention. At the same time, in the medium to long-term, the most effective measures are incentives and subsidies for recruitment in the private sector, followed by training interventions (these, unlike in previous studies, have positive but not statistically significant coefficients). Finally, the authors did not find any significant gender differences.

Focusing on training programmes for young people, Kluve & al. (2019) analyse 113 evaluation studies of interventions implemented in both advanced and developing countries over the past 20 years. Overall, only a little more than a third of the total evaluations show positive results, confirming what was seen previously (the analysed evaluations showed statistically significant positive effects, although the average magnitude of the effects is small). An interesting aspect is that programmes that integrate different types of interventions and services are more likely to be effective, probably because they are better able to respond to the diversified needs of the recipients. Policies for young people based on profiling systems are also more effective. Finally, the Kluve & al. study also confirms that impacts tend to grow in a way related to the temporal distance after the conclusion of the interventions. According to

the country's income group, the results vary: youth employment interventions are more successful in mid- and low-income countries than programs conducted in wealthier economies.

The work of Orfao and Malo (2021) focuses attention on the elderly unemployed and highlights that, on average, active policies have had a slightly negative effect (-0.8 percentage points) on the likelihood that unemployed people over the age of 50 will find a job and that this negative effect disappeared 24 months after implementing the policies. However, these effects vary depending on the type of policy: while the direct creation of public jobs has a negative effect, training policies showed an average positive effect. In addition, the analysis reveals slightly different results by gender, with the effect of active policies being greater for women than for men.

Levy Yeyati et al. (2019) analyse only randomized trials. Their analysis shows, on average, a moderately positive impact on employment and economic performance. The most effective type of policy is subsidies. Unlike Kluve (2010), the authors highlight that the unemployment rate is negatively correlated with the probability of success of active labour policy programs and again, differently from previous authors, Levy Yeyati et al. (2019) point out that softer interventions (assistance and guidance) have limited effects, while the results of interventions that affect skills, such as vocational training and retraining, are more effective.

In Italy, the tradition of counterfactual impact studies has had greater difficulty in establishing itself, but in recent years studies carried out at the academic level and evaluations linked to European funds have increasingly applied counterfactual approaches to the analysis of the effects of labour policies. For example, according to the "Evaluation Helpdesk" project database, Italy is among the countries with the highest number of counterfactual evaluations of ESF-funded interventions (20 evaluations out of 113 overall).[3]

Maitino & al. (2012) studied training interventions financed by the ESF OP 2000-2006 in Tuscany between 2007 and 2008. The results show a positive effect on the probability of being employed 36 months after the training course, with a positive differential compared to the control group of 10 percentage points (pp) for the unemployed and 20 pp for those looking for a first job. Only for the latter, however, the impact is positive on the probability of finding stable employment, while for the unemployed group, training interventions do not show added value in facilitating entry to stable employment. Moreover, among the unemployed, the effects are greater for men (for women, the effect is positive, but not statistically significant), with a low level of education and advanced age (i.e. over thirty). For the unemployed, positive effects are also observed for those with a high school diploma and young people under twenty. The effects are greatest for the unemployed who enter training as long-term unemployed. The authors find a consistent lock-in effect in the short term.

Duranti & al. (2018) analyse training carried out in Tuscany and financed by the ESF in 2007-2013 for the unemployed. The study estimates a positive effect on the probability of being employed about 18 months after starting the courses, equal to 8.2%. However, this effect is reduced to 3.7% when permanent employment is considered. The greatest positive effects are the Italians, the oldest unemployed recipients, with a low level of education and in conditions of long-term unemployment, especially those unemployed between 12 and 24 months. In addition, the integration between training and internship experience has greater effects than the simple training course (+11 percentage points of difference between treated and untreated).

[3] The project, carried out by Ismeri Europa ed Applica for the European Commission, DG REGIO and DG EMPL, collects and analyses all the evaluations published on the European websites of the Managing Authorities of the ERDF and ESF programmes since 2015. The summaries of the evaluations are published in the online library of the European Commission, see the following link: https://ec.europa.eu/regional_policy/en/policy/evaluations/member-states/

Ismeri Europa, 2011, evaluated the impacts of the Dote Lavoro e Formazione in Lombardy (the voucher consisted of ESF training courses and employment services) between 2009 and 2010 and found a null effect on the probability of finding work about ten months after the course ended, but positive effects on the empowerment of people, in fact, the recipients of the voucher, are eight percentage points more likely to actively seek jobs than the control group.

For the Marche Region, Fondazione Brodolini (2013) analysed the work experience interventions (job grants and research grants) funded by the ESF in 2010 and found a positive effect in the months following the end of the experience. However, this effect tended to fade after a year; overall, in the 12 months following the intervention, the recipients worked 40-50 days more than the control group.

Bazzoli & al. (2018) focus on the training courses funded in the Autonomous Province of Trento in 2010-2011, with ESF resources and regional resources. In both cases, positive effects occur only from the 12th month; after 24 months, the effect is greater for ESF courses than for courses financed by the province (+27% against +6%). The effects are higher for women (but not for foreign women) and are manifested only for older recipients. Also, De Poli & Loi (2014) analysed courses held in the Province of Trento in 2010, particularly those of extended duration (from 300 hours upwards). They have positive effects, equal to 5-6 pp probability higher than the control group, of being employed 12 months after the intervention. The greatest effects are found for the population between 25 and 45 years and for foreign men. The interventions did not affect permanent employment.

Ghirelli & al. (2019) analyse work experience projects for graduates carried out in 2013 by the Umbria Region and funded with the ESF. Two years after the interventions, the results are positive: the target group is about 12-14 pp more likely to be employed than the control group. On the other hand, the interventions did not affect the probability of obtaining permanent contracts. The most advantaged recipients are young people, men, and those with a university degree in sciences.

Post-diploma training courses for people aged between 20 and 29 carried out in Piedmont towards the end of the 2000s and financed by the ESF were analysed by Mo Costabella (2017). The study shows that the effects on employment are positive, although not high (5 pp), starting from 12 months from the beginning of the course and up to the fourth year. The greatest effects are found for those who have entered the training courses without working in the previous 24 months and for the youngest participants. No gender differences emerge.

More recently, in Tuscany, Cappellini & al. (2018) have analysed the internship courses carried out between 2012 and 2015 and intended for young graduates or those aged between 18 and 29 who have abandoned their studies in the previous two years. The results on the probability of being employed 18 months after the beginning of the interventions are positive: in particular, for the internships co-financed by the Region, the recipients without previous experience show almost 15 pp greater probability of being employed, while for young people with previous experience the results are lower, but always positive (+7 pp). Furthermore, the study also finds that internships also positively affect the amount of time worked (expressed in days) from interventions to the time of analysis.

Pastore & Pompili (2019) analysed the PIPOL program implemented by the Friuli Venezia Giulia Region, with ESF funding. PIPOL finances training courses and internships. The work focused on the interventions financed between 2014 and 2016 and, two years after the programme ended, the authors find positive effects mostly for internship interventions, while training courses tend not to yield any effect in the short term, but only in the long term. Internship also helps to find permanent work (+3%). The net impact is greater with women, foreigners, poorly educated young people. Some types of classroom training, such as qualification training, still positively impact job opportunities.

A study by Ismeri Europa for the European Commission (Ismeri Europa- Ecorys, 2019) examined the

active labour policy interventions financed by the Veneto Region with the ESF between 2015 and 2016. It aimed at different types of unemployed people over 30 and comprised training courses which, in some cases, were supplemented by internship experience (about half of them). The results show positive effects. In particular, the paths that integrate training and internship seem to be more effective than those that are limited to training only; the advantage vanishes if only permanent employment is considered. The results for the long-term unemployed do not differ from those for the whole sample.

For the Marche region, Giorgetti and Pompili (2020 and 2020a) analysed training interventions, internships, job grants, long-term, and other forms of work experience for the unemployed. Twelve months after the interventions, as regards training interventions, there were positive effects on the employment rate for ITS-IFTS and employment-guaranteed training, while no statistically significant results emerged for sectoral skills training. Training specifically aimed at young people had negative effects. Overall, ESF training interventions have so far had positive and statistically significant impacts for women, the over 30s, graduates, and foreigners. Internship (financed in the territories affected by the earthquake) has proved to be an effective tool over the short term (12 months): after 12 months the trainees are 5 pp more likely to be employed than the control group. The internships had positive effects across all the different targets reached: women and men, over and under 30 (a little less), and holders of high and low educational qualifications; the instrument has also been effective for the long-term unemployed. For job grants, the impact analyses do not reveal any average effects, except for the target of foreigners and the long-term unemployed.

For In a study conducted in 2015 in Piedmont, Donato & al. (2018) found positive effects on professional training courses equal to 14 pp of the difference between treated and control group, starting from 12 months from the beginning of the course. The effect did not fade with time (at the 18th month). Results for the over 40s are positive only in the long run, in the following 18th month. Interestingly, the long-term unemployed (more than 12, but less than 24 months) exhibit better results than the short-term unemployed. The same authors, Donato & al. (2019), in an Evaluation Report for the Piedmont Region that takes the professional training courses of 2015-2016 into account, find a consistent, though lower (+8 pp) positive effect, pp; the lower result could be because of a different organizational mode of the courses and the operating methods of the training. There are no substantial differences for gender, while the evidence does not change substantially compared to the previous study for the long-term unemployed. Still, regarding training courses, Poy & al. (2020) analyse those implemented in 2017, which mostly confirmed the previous results. Finally, Pomatto & al. (2021) focus attention on the measure of "Good services at work", aimed at specific target audiences, including people over 30 who have been unemployed for at least six months. The measure offers one or more active labour policy measures provided by specialised operators (guidance, job search support, traineeships, work experiences). The results show that the effect is positive (about +13 pp), lower for those who received only guidance and activation services, higher for those who also had benefited from work experience. In all the paths for the over 50s the impact is smaller, while for foreigners the effects are higher than for Italians after 12 months, but similar after 24 months.

Interesting results then emerged from the evaluation of the Youth Guarantee. In the first evaluation report of 2016, Isfol assessed the employment impact of the interventions carried out from May 2014 to September 2015 (Isfol, 2016). In particular, the authors focused on employment conditions at the end of the interventions (September 2015). They analysed the difference between the treated and a control group composed of those who, enrolled, were waiting to receive treatment, or be enrolled for over 120 days, and young people (under 30) not enrolled in the Youth Guarantee. The analysis results show a probability of being employed as a GG of 7.8 pp. higher than the control group, which becomes 8.9 points considering only the internship interventions. The II° Evaluation Report of the Italian Youth Guarantee,

carried out by ANPAL in2019, confirms the positive results even after 18 months from the taking charge of young people (+12 pp probability of being employed). Besides employment incentives, traineeships determine the positive outcome, as neither civil service experiences, nor training, show any positive (indeed negative) effect [4]

Finally, outside the European funds, Scarano (2020) has recently analysed several active labour policy interventions implemented in 2015 in the metropolitan area of Bologna in Emilia-Romagna. The analyses identified zero effects on employment for the short-term unemployed but positive effects for the long-term unemployed, equal to 5 pp difference with the control group. The author speculates that one possible explanation for this finding is that public employment services have given more attention to the most disadvantaged.

In conclusion, the evidence at the international level suggests that, in general, the effects of active labour policies (excluding the creation of public jobs) are moderately positive. However, the variability of impacts is wide and linked to several factors (type of targets achieved and interventions, the economic cycle, characteristic elements of implementation). Evidence shows that interventions tend to be more effective in the medium- to long-term, especially training ones and that interventions appear more favourable for disadvantaged users (long-term unemployed, women) but when they are not too hard to employ, such as disabled or aged workers. Overall, there is an unfavourable trend for the target audience. Studies at the national level find mostly positive effects of interventions on the probability of employment of the participants, although there is no lack of less positive results, especially regarding some targets (young people, for example). National studies also confirm lock-in effects that prevent results from being achieved in the short-term. However, the differences between the studies are wide in terms of the intensity of the effects and the target groups who are able to benefit more from the interventions.

Method used

Our econometric analysis follows a counterfactual approach comparing a group of treated and a control group, both chosen to be very similar under different observed characteristics. The main challenge and advantage of this approach are to prevent bias due to sample selection (at least for the observable characteristics) in identifying the target and the control groups since bias would result in an under/overestimation of the impact of the treatment. In fact, if, for some reason, the target group were to have better (worse) employability characteristics than the control group, the impact of the programme itself could be overestimated (underestimated if the opposite is true).

Referring to the first case, the one for which the recipients had characteristics superior to the control group, the greater values of the outcome variables found for the target group could be attributed to the treatment when in fact, they should be attributed to the heterogeneity between the two groups. In other words, a necessary, though not sufficient condition to grasp the actual impact of the programme is that the target and the control group differ only in terms of treatment, all other conditions that affect an individual's employability (e.g., personal characteristics, previous training, previous work experience, etc.) (See, among others, Angrist, 1998; Angrist and Pischke, 2009; Cerulli, 2015; Sianesi, 2004).

However, it is important to clarify from the outset that while our approach does eliminate distortion due

[4] Abbagnale et al. (2017) provide an aggregate-level assessment of the impact of the GG. The authors look at the variation in the probability of finding employment and the evolution of the channels of entry into the world of work for young people between 15 and 29 years of age following the introduction of GG in the Piedmont and Sardinia Regions. Their analysis is based on administrative data from Employment Information Systems (SIL), to which they apply an approach difference-in-difference, using members of the Employment Centers 30-40 years as a control group, as they are not eligible for the Program. The results highlight a limited effect of the measure on the increase in the probability of being sent to work in Piedmont, but a null effect in Sardinia. The study also shows that the programme has led to a reduction in the use of short fixed-term contracts and an increase in traineeships for young people, compared to the pre-programme.

to observable differences between the target and control groups, it does not provide any guarantee against the possible omitted heterogeneity, i.e., because of unobserved characteristics of the two groups. Omitted heterogeneity may include, for example, motivation in finding a job, talent, or skill that is not measured in our database. To ensure that the two groups are as similar as possible, also from the point of view of the omitted heterogeneity, required caution in our selection. Of course, this is never 100% guaranteed, but we have tried to minimize this possible source of distortion by selecting target and control groups in such a way as to minimize differences in omitted heterogeneity (see below). Moreover, following Caliendo et al. (2015), to maximize control for omitted heterogeneity we reconstruct the employment status of treated and untreated individuals up to two years before the start of the program.

In order to minimize observed differences in characteristics between treated and untreated people, we resort to *propensity score matching* (PSM). This statistical matching technique identifies the control group in untreated subjects with observable characteristics that are the most similar to the treated group.

Following Angrist and Pischke (2009), we estimate the so-called ATT, or the average effect of treatment on the treated. Once a control group with the same characteristics as the target group which has not participated in the program is available, it will be possible to define something very similar to an ATT. More analytically:

$$ATT = (Y^1|D = 1) - E(Y^0|D = 1)$$

where D is a variable equal to 1 if treatment occurs and 0 if it does not occur; Y^1 is the value of the outcome variable given the treatment, and Y^0 is the result variable in the absence of treatment. Indeed, Y^1 and Y^0 refer to the target group and has not undergone treatment. But, again, since the same target group cannot be observed after receiving or without receiving treatment, the ATT is estimated by comparing the values of Y^1 and Y^0 relative to a Target Group and a Control Group, that is, individuals who have exactly the same characteristics as the target group but did not participate in the program.

The correct identification of the ATT requires that at least three fundamental hypotheses be verified:

1) conditional independence assumption (CIA), or analytically: $(Y^1, Y^0)D \perp, X$
2) SUTVA hypothesis (Stable-Unit-Treatment-Value Assumption) or "hypothesis of stable value of the treatment unit"
3) common support hypothesis: $0 < P(D = 1 \perp X = x) < 1$

where X represents a set of covariates that can complicate the analysis as both are related to the selection in the probability of receiving treatment and the possible outcome.

Hypothesis 1) implies that the outcome is independent of participation in the programme conditioned by observing characteristics X. In other words, by verifying all observable characteristics, the decision to participate in the program should not be related to the possible outcome. The extent to which this occurs depends on the availability of the data. This hypothesis suggests that the proposed approach is not exempt from endogeneity problems due to unobserved variables.

Hypothesis 2) excludes the possibility of spill-over effects or general economic effects determined by the programme and indirectly affect the programme's outcome. This could happen, for example, if active employment policies (treatment) led to an increase in public spending and, consequently, aggregate demand to increase the likelihood of finding work for everyone, especially for programme participants. This hypothesis is certainly verified in the present case, given the relatively small size of the expenditure at stake and the relatively small number of participants in the programme.

Hypothesis 3) implies that the probability of participating in the program is not certain for a given value

of the observed characteristics of individuals in sample X. In other words, for a given observed characteristic of individuals, there should be no particular reason why an individual who possesses it is more likely to be in the target or control group. This hypothesis is verified if we find common support that is not different between the target and control groups. In other words, the two groups must have similar characteristics.

For the third hypothesis to be verified, it is e essential to identify a valid control group. In our case, the control group was drawn from people enrolled in the Province of Bolzano's employment centres between 2016 and June 2020, but who, for whatever reason, had not joined any of the ESF program's intervention. These subjects were potentially eligible to participate in ESF courses but had not participated. As such, they were a plausible control group since they had signed a declaration of immediate availability to attend a training program and actively seek a job.

The model used is applied in a two-step procedure. In analytical terms, this procedure consists of estimating the determinants of an outcome or objective variable (O), as a function of an indicator variable (T), a series of individual characteristics (X), and an error term (ε). In formulas:

$$O = \beta X + \delta T + \varepsilon \qquad [1]$$

As the main outcome variable, we used a dummy of the working condition in the period 6, 12 and 13 months from the start of the training courses. Other objective variables were, being hired with a permanent employment contract 13 months after the start of the courses; having had at least one work experience after the courses (regardless of the period in which the subject has had it).

T is instead a treatment variable, which takes the value of one for program participants and zero for non-participants. We have distinguished two types of treatment: a) training under Axis I; b) training under axis II. We could not distinguish different types of courses as they were very similar in the two axes and almost always included a period of on-the-job training together with off-the-job training.

Clearly, directly estimating the [1] with a probit would mean incurring the distortion by the self-selection of the sample of treated Therefore, in phase one, we estimate the determinants of the probability of experimenting with our treatment variable:

$$T^* = \gamma'\varphi + u \quad [2]$$

where

$$T = 1 \; if \; T^* > 0 \; and$$

$$T = 0 \; otherwise$$

Equation (2) is typically estimated with a standard probit model. This represents the probability of being in the group of treated and, therefore, of receiving treatment based on the observed variables (φ) with given coefficients (γ). The covariates in our case included:

- age

- gender

- citizenship

- level of education attained: lower secondary, upper secondary, university or higher education

- the presence of work experience acquired before the start of the program, measured in the 24 months prior to the start of the courses

- municipality of residence

- entry quarter

Several studies (e.g. Caliendo et al., 2017) have shown that including previous work experience in the variables used for matching, increases the likelihood of capturing unobservable elements in the differences between the treated individuals and the control group, therefore absorbing the possible bias due to endogeneity.

Based on the estimated equation [2], a propensity score is then predicted for each individual in the control group, based on the person's characteristics (Bryson et al., 2002). Next, we selected a sample with the score most similar to that observed for individuals in the target group from those who had not attended the program.

Given the nature of our sample, for which the treated group (equal to 615 and 364 individuals for Axes I and II respectively) corresponds to a control group of 61,876 units, we use the Nearest-Neighbor Matching method that pairs each treated individual with 1 or 5 individuals who had the closest propensity score value (Becker and Ichino, 2002). We chose a small number of individuals from the control group because of the small number of treated. A limitation of this approach is that a small portion of the treated individuals may not find common support[5] in the individuals selected in the control group. For robustness control, and to reduce the risk of lack of common support for some treated components, we also use the Mahalanobis distance method, i.e. we choose an individual from the control group who had precisely the same characteristics as a certain individual in the target group. However, the results obtained with these two pairing methods are quite similar in all estimates, confirming the goodness of the estimates based on *Nearest-Neighbor Matching* [6].

We calculated standard errors in several ways, including a bootstrap method with 50 replications (see Lechner, 2002), but the results seem unaffected by how standard errors are calculated. Indeed, the correction of standard errors based on bootstrapping is of very small magnitude.

In the second step, we estimated equation [1], i.e., the probability of experiencing the outcome variable for program participants (the target group) and a sample of individuals enrolled in the program, but not attending, with the same characteristics (control group) selected based on our propensity score and the different types of distance from the target group. If the third hypothesis mentioned above is respected, the PSM procedure ensures that the target and control group have the same result in terms of the potential outcome. The coefficient of the treatment variable (training program) in use (δ in equation [1]) gives the estimated ATT.

As noted above, in approach to potential recipients, there are differences in both the characteristics of the recipients themselves and the characteristics of the courses between the interventions of the two Axes. This prompted a differentiated assessment of Axis I and Axis II participants. For both Axes, we first analyse the overall average effect for the entire target group of each axis. Then we highlight whether there are heterogeneous effects between different recipients by distinguishing the sample by gender, age, educational qualification, and citizenship. Due to the small number of participants in Axis II, the analysis of heterogeneity by educational qualification and by citizenship is not carried out for Axis II.

Data Used

The study uses three types of data. First, from the monitoring data of the Programme, we identified the

[5] There is common support if the joint distribution of features pre-treatment of the subjects participating in the ESF course has a sufficient region of overlap with that of the members of the control group, so as to ensure that each individual treated can be associated, as a control, with at least one individual not treated with the same distribution of characteristics pre-treatment.

[6] As shown later, the method of the distance of Mahalanobis tends to return slightly less positive results.

group of recipients who had participated in a training course. The monitoring data contain information on the socio-demographic characteristics of the participants and the start and end date of the interventions. In order to have at least one observation period from the start of the 12-13 months courses (having data on the employment status of people at most in July 2021), the analyses covered ESF-funded training courses launched by June 2020 at the latest.

Second, we identified the control group from the data of the persons registered in the PESs. Operationally we did not have direct access to these data, but we agreed on the criteria for selecting the control group with the provincial offices,[7] which then extracted the individuals operationally and anonymized the data.

Third, from compulsory communications (COBs)[8] we reconstructed the occupational status of individuals in the sample of both treated and untreated for three years, two years before and one year after the program. Also, in this case, data management of the row COB data (new contracts, extensions of temporary contracts, changes of the legal form of contract was done by the local offices of the Province, and information was provided anonymously and through monthly dummy variables for each individual (equal to 1 if employed in that month and 0 if non-employed).[9] This data source contains information on any type of labour contract which has started, ended, or changed legal form (e.g., move from fixed-term to permanent and vice versa) of both treated and untreated samples.

A limitation of COBs data is that it excludes three categories of workers: the self-employed, those who find a job in another region, and, obviously, informal workers for whom the employer and employee sign no formal labour contract. It means looking at the probability of the treated to find a formal job as wage employees in the same region as the region of residence. In principle, we cannot exclude that the untreated found informal jobs, and/or were self-employed, and/or were wage employees in another region. However, as in other papers in the relevant literature (see, among others, Ghirelli et al., 2019; Pastore and Pompili, 2020), we hypothesized that these phenomena (self-employed, people working in another region and informal workers) would affect both the treated and the control group in the same proportion. In fact, most, if not all the existing studies of program evaluation in Italy gather information regarding participants' employment status in training programs from the same COBs data and consequently make exactly the same assumptions. Another limitation of the COBs data source is that these data do not provide information on other, possibly interesting, variables, such as the earnings of those who find a job.

Our analysis focused on 979 participants of training courses (615 related to courses of Axis I and 364 to courses of Axis II), while the control group was composed of 61786 people. Overall, our treated people under Axis I entered the program between the first quarter of 2017 and the second quarter of 2020; the treated people under Axis II entered the program mostly during the fourth quarter of 2018 (Figure below). Therefore, in the case of Axis I interventions, about one-fifth of the recipients entered the training courses in the first quarter of 2020, during the spread of the Covid-19 pandemic. For Axis II, all the paths started before the onset of the pandemic. Looking at the period of completion of the interventions, we note that for Axis I, those who finished the courses in the period before Covid-19 made up a little more than half of the total, while for Axis II almost 100% of the recipients completed the training course before the pandemic period.

[7] As mentioned above, we extracted people who have signed a declaration of immediate availability to work in the period 2016-June 2020.
[9] A person was considered employed in a month if in that month there was a contract to start work, regardless of the number of days actually worked in that month. For the definition of employee, all types of employment contracts are considered with the sole exception of internships and socially useful jobs (LSU).
[9] A person was considered employed in a month if in that month there was a contract to start work, regardless of the number of days actually worked in that month. For the definition of employee, all types of employment contracts are considered with the sole exception of internships and socially useful jobs (LSU).

[Figure 1 here]

In relation to the differences in the training content provided within Axis I and Axis II, the data confirms what the training organizations showed (Fig 2 below). Apart from some overlaps, the professional qualifications provided are somewhat different between the Axes: professions in business administration and management, tourism, commerce, and information technology with regard to Axis I; professions related to the world of catering (with many courses for assistant cook and pizza maker), construction, cleaning of environments and greenery and the world of assistance to people concerning Axis II.[10]

[Figure 2 here]

Descriptive Analysis

The following table shows the differences between the Axis I funded training participants and the potential control group. As the control group is made up of all the people who have registered at the PESs in the same ESF reference period, we expect the two groups to differ in terms of characteristics that determine employability, such as gender, age, level of education, citizenship.

Table 1 shows that, before matching, the proportion of women among ESF recipients of Axis I is very high (almost 70%), higher than for the control group (57%). Foreigners are almost 40%, slightly higher than the control group. For sex and nationality, these two differences are statistically significant, suggesting they are a consequence of the program's targeting. The average age of Axis I recipients is about 37 years and 35% of the total is composed of people under the age of 30, a figure not significantly different from that of the control group. Finally, regarding the educational qualification data, the Axis I recipients have an average level of education higher than the control group (graduates among the recipients are 20% on average against 6% of the control group). Although the significance level is not very high for the participants holding a high school diploma, these differences are statistically significant, suggesting that the differences between the treated and control groups are smaller. Particular criteria cannot explain the figure for access to ESF training courses: as noted above, the calls for participation did not require candidates to include any specific qualification. The figure probably suggests that holders of higher education qualifications have more tools to intercept training and/or labour market opportunities and therefore participate in tools made available with the ESF than the average of unemployed registered with the PES at the provincial level.

Overall, also with reference to what emerges from the literature, there is evidence of lower employability of the group of treated according to some characteristics (greater weight of women and foreigners), but of greater employability in relation to other characteristics, such as educational qualifications, which are higher in the recipients.[11]

[Table 1 here]

In the case of Axis II, the treated group differs greatly from the control group (Table 2 below). Axis II participants are also very different from Axis I participants. This corresponds to the aims of the

[10] We reconstructed the thematic areas through a reclassification of the titles of the courses and their description available on the online sites of the training institutions.

[11] In general, it is known from many studies on the subject that women have less employability than men, especially if they have children, since they are more engaged in care and domestic activities (see for recent and comprehensive studies of the extensive literature, Blue and Kahn, 2017; Meara et al., 2020); younger people have greater difficulty finding work because of their lower human capital, since they often lack general and job-specific work experience (Pastore, 2015; and, for the Italian case, (Pastore, 2019); individuals with a lower level of education have a lower probability of employment, as well evidenced by much literature.

intervention, which were addressed at particularly vulnerable individuals, such as immigrants. It can be clearly noted that the target group from Axis II comprises mostly young immigrant men with predominantly lower average education levels. The treated, in fact, includes a percentage of women about 31 pp lower than that of the control group, which may be considered as fairly representative of the unemployed in the provincial territory. In addition, the participants include predominantly immigrants, about 95%, many more than those in the control group (33%). Young people are prevalent in the treatment group, accounting for almost 70% of the total, a much lower share than the control group (34.4%).

In addition, almost 90% of the treated have a qualification equal to or lower than secondary school; 9.1% have a high school diploma, and only 1.6% have a bachelor's degree. These percentages show that the target group of Axis II is, overall, less endowed with human capital than the control group. It should also be added that the immigrants selected in Axis II belong to the weakest segments of their group since they had recently arrived in the country and therefore had considerable deficiencies in the knowledge of the Italian and/or German and a very limited network of relationships. Therefore, it is important for this group to underline the importance of language courses and for the first opportunities for social and labour integration.

[Table 2 here]

Given the higher weight of the foreign population in both of the treated groups in the two Axes on the total number of recipients of the interventions, the area of origin of the foreigners is interesting. The following figure (Figure 3) highlights a very different situation between Axis I and Axis II: while in Axis I, foreigners reached come from different areas, with a sizeable presence of migrants from Europe, Eastern Europe, Russia, and the Americas, in Axis II there is a prevalence of migrants from Central and Southern Africa (almost two-thirds of the total), which, together with people from North Africa, and India, Pakistan, and Bangladesh represent 90% of the total migrants reached by Axis II. This could be due to the type of approach and selection towards foreign users that has been somewhat diversified between Axis I and Axis II, as seen above, but above all from the fact that for access to Axis II the recipients had to be migrants (including asylum seekers) therefore coming from non-EU countries.

[Figure 3 here]

The quality of matching

We adopted several matching procedures to minimize the observed differences between the treated and control groups. We start from a *propensity score matching* with the Nearest-Neighbor Matching (NNM) criterion with the value closest to that of the control group, which provides that individuals of the selected control group are coupled to the group of treated to have the closest values of the *propensity score* of the treatment group. For robustness control purposes, i.e. to check whether results changed with different approaches, we used matching with one and with five individuals taken from the control group. Finally, we adopted the Mahalanobis distance-based matching, which is the most precise and minimizes the differences between the treatment and control group since it takes individuals from the control group only with the same characteristics as the recipients. In addition, we calculated standard errors with very different methods but with few differences in the results.[12]

In relation to Axis I, Table A1 in the appendix shows the differences between individuals in the treated

[12] In addition, we tried different callipers to measure the impact of variables, but the results do not change substantially.

group after matching with 5 individuals extracted from the control group. This table clearly shows how the differences between the treatment and control groups existing before matching disappear after matching, i.e. it decreases in absolute value and, above all, it becomes non-statistically significant. This suggests that matching worked satisfactorily, selecting individuals in the control group similar to those in the treatment group, which should only allow identifying the effect of participation in ESF training courses on employment rates, rather than previous heterogeneity between the two samples. It is clearly seen from the table that the values of the statistics t are very low, and the probabilities are all above 0.1, which suggests the non-significance of the differences in the variables used for matching. This allows us to say that the differences found after the matching between the treated and control groups in the outcome variables depend on the program and not on differences in the employability characteristics of the two groups, at least the observed characteristics.

Figure A1 in the appendix presents the graphs for common support in the PSM with five observations for matching. The figure shows broad common support that allows adequate control for the different observed characteristics of the treatment and control groups, although some observations of the former have minimal common support in the control group.

As far as the Mahalanobis distance is concerned, the differences between characteristics after matching are again not statistically significant, as shown in Table A2 in the appendix. Figure 4 below gives a graphical representation of the differences as based on the Mahalanobis matching. The figure shows how, before the matching, there were considerable differences between the control and target groups, which disappear after the matching. This can be seen by observing the distance of the black dots and crosses from the central line: in all the variables, the crosses, which represent the differences between the two samples after matching, are near the line of origin, while most of the black dots, which represent the differences between the two samples before matching, have a greater distance from the line. Only the first variable, age, seems to remain slightly higher in the treatment group even after matching.

[Figure 4 here]

Table A3 in the appendix shows that also for Axis II, the matching procedure is effective since the differences between the treatment and control group after matching are all reduced to values close to zero and are almost all not statistically significant. Figure A2 in the appendix presents the graphs of common support in the PSM estimates with five observations for matching, showing that broad common support allows adequate control for the different observed characteristics of the treatment and control groups. However, some observations of the treatment group have common support in the rather small control group, as for Axis I. To overcome this problem, as already done in the case of Axis I, we also adopt a second matching procedure, the Mahalanobis distance, which is more accurate as it provides an observation in the control group for each observation of the treated group with the exact same characteristics. The next figure (Figure 5) graphically shows the test between the treatment and control groups before (black dots) and after matching (crosses) when matching is carried out with the Mahalanobis distance procedure. While before the matching, there were also considerable differences between the two groups; however, after matching, all the crosses approached the zero axis, signalling the absence of statistically significant differences between the two groups. This suggests that the matching procedure via the shorter Distance of Mahalanobis effectively achieved the goal (see also Table A4 in the appendix).

[Figure 5 here]

Econometric Analysis of the Impact of ESF courses

Axis I

Below we present the estimate based on matching with NNM to five pairs and the estimate with Mahalanobis distance. Table 3 presents the impacts measured in terms of the difference in percentage points between the employment rates of the treatment and control group (ATT). We report the estimates for the outcome variables related to the employment status at 6, 12 and 13 months from the beginning of the courses and the permanent employment measured at 13 months.

Starting from the results with the NNM method with five pairs, the differences between the treatment and control group before matching are always statistically significant, while those after matching are progressively fewer The effects go from an advantage in the probability of occupation among *the unmatched (before matching)* in favour of the control group of 16 pp and 6 pp approximately after 12 and 13 months to an advantage in favour of the group of treated of 2.3 pp and 3.6 pp after matching. However, the values of the t-statistics are insignificant after 12 and 13 months from the start of the courses.

How should these results be interpreted? Unmatched individuals are heterogeneous individuals, and in particular, the control group has better characteristics than the treatment group of course participants. This explains why the former have a higher probability of employment after the courses. However, when matching, the comparison is not between the treatment group and all the individuals in the control group, but only with those in the control group sharing characteristics similar to those in the treatment group. After matching similar individuals in the control group, the specific effect of the course being positive is seen to the point of not only nullifying the initial advantage of the control group but actually reporting an advantage for course participants 12 and 13 months after course participation, although this is not statistically significant.

This is clearly a satisfactory result for Axis I vocational training courses as it shows that these courses eliminate an initial disadvantage for the participants, even generating an advantage in their favour over time. It would be interesting to see how much this advantage increases over time if we could observe the differences after 24 months, or even over a longer period. The trend lines highlighted by the descriptive analysis above suggest that the advantages of the courses increase over time, but this cannot be verified empirically with the data at our disposal, which, as explained in the previous sections, allows for analysis at most 13 months after the courses.

In relation to the variable “permanent employment” there are generally few permanent employees in both the treated and control groups, even before matching, standing at around 10-12% for both. The difference favours the control group 13 months before the start of the courses (about 3.3 pp); moreover, although small, the difference is statistically significant. After matching, the difference is reduced to 1.3 pp and loses statistical significance.

The lower part of the table proposes a similar analysis but obtained with the Mahalanobis distance that allows a more rigorous matching in terms of similarity between the treatment and control group after matching. This is a robustness test to see the extent to which the matching method affects the results. We find that the results are very similar for almost all outcome variables. Furthermore, the differences between the treatment and control groups decrease after the start of the courses, becoming not significantly different from the statistical point of view between the two groups after matching. Overall, this robustness test confirms the results’ stability, regardless of the matching method adopted.

Figure 6 shows the evolution over time of the employment rate of the two groups. First, it should be noted that, after matching, the trend in the employment rate prior to participation in the ESF is almost

identical between the treatment and control groups as a result of the matching procedure. Second, there is a slow convergence in the employment rates of ESF recipients after the programme, starting from the 8th month. By the 13th month, the employment rate of the target group becomes slightly higher than that of the control group.

[Table 3 here]

[Figure 6 here]

Effects by gender

Table 4 below presents the results of econometric estimates of differences in the likelihood of being employed 13 months after the start of the course for women. Women who participate in courses tend to have a significant disadvantage compared to others before matching. However, this disadvantage cancels out and even becomes positive in favour of women participating in the courses. It is also statistically significant with matching based on the NNM. With all other things being equal, the net benefit for women receiving ESF courses is around 8 pp in terms of the greatest likelihood of being employed after participating in the course. The differences between the two estimation methods depend on the more restrictive character of matching based on the Mahalanobis distance. Turning now to men, the econometric analysis shows that the program is less effective for men than for women. The distances between the treatment group and the pre-matching control group are greater than among women, reaching a disadvantage for the treatment group of about 9.3 pp. This disadvantage narrows considerably after matching, falling by about two-thirds and becoming statistically insignificant, but it never in favour of the treatment group.

Overall, the data show that Axis I courses have worked better for women, which is undoubtedly positive, given that the vast majority of recipients reached by Axis I are women.

[Table 4 here]

Effects by education levels

The table below looks at heterogeneity in terms of education levels. Individuals with a maximum level of education equal to lower secondary school belonging to the treatment and control group are first compared. Before matching, the respondents in the control group have greater employability than those in the treatment group. However, this difference is greatly reduced, going from -8 pp to -1.7— -1.9 pp, after matching, becoming no longer statistically significant in both the NNM and the Mahalanobis distance estimates. A similar conclusion concerns the recipients with a high school education level. Again, the differences are statistically significant before matching, amounting to -6.3 pp in the 13-month employment rate. After matching, the participants in training show a greater probability of employment than the control group, although this advantage is statistically significant only when matching using the NNM distance, while it is not statistically significant, although positive when it is estimated using the Mahalanobis distance. Finally, even for university graduates and those with higher qualifications, there is a disadvantage for the treatment group before matching (-7.4 pp), which turns into an advantage of 5.5 pp or 3.7 pp, depending on whether matching with the NNM or the Distance of Mahalanobis is used. In both cases, the advantage is only weakly significant from a statistical point of view.

Overall, the data indicate that Axis I training worked better for recipients with a very low level of human capital.

[Table 5 here]

Effects by nationality

The third type of heterogeneity studied is based on nationality. The following table (Table 6) presents pre- and post-matching employability estimates for Italians and foreigners. The main effect of the program is on foreigners. In the case of Italians, the pre-matching disadvantage of about -8.2 pp is cancelled, which becomes an advantage with estimates based on the NNM, even if the difference in favour of the treated is not statistically significant. With foreigners, we move from a level playing field between the treatment group and pre-matching control to an advantage for the group of people who had participated in the training that reaches 7.2 pp of higher employment rate with the analysis based on the NNM method. The advantage is also statistically significant, though weakly so. The Mahalanobis distance estimate measures a post-matching weakly significant advantage favouring the group of the treated of about 2.6 pp.

Overall, the analysis seems to suggest greater effectiveness for foreigners, for whom there are probably few alternatives to the vocational training provided under Axis I.

[Table 6 here]

Effects by age

The last element of heterogeneity considered in Axis I participants is that of age, where we aim to understand whether the programme is more effective for young people (under 30) or for adults (over 30). The table below suggests that the programme's effect is greater in the case of adults. With young people, the disadvantage observed in the two pre-matching groups becomes a weak advantage in favour of young people, which reaches 3.8 pp when the estimate is based on the matching of the NNM, but remains only weakly significant from a statistical point of view. Among adults, there is a disadvantage for participants in the pre-matching program of -7.9 pp. After that, the disadvantage becomes an advantage in favour of adults (+3.8 pp) in the analysis based on matching with NNM and is weakly significant from a statistical point of view. Finally, in Mahalanobis' matching analysis, there remains a disadvantage for program participants of about -4.5 pp. This contrasting result suggests low robustness and a greater sensitivity of the other results to the estimation method adopted.

[Table 7 here]

Axis II

The program's effect on the probability of employment 6 months after the start of the intervention shows that the comparison before matching the treatment and the control groups is very favourable to the latter (table 8 below). This logically stems from the selection made by the programme, which focuses on people with several employment reducing vulnerabilities. In fact, their probability of employment was consistently lower than that of the control group in the months prior to participation in the intervention. This lowered probability is also reflected in the comparison before the matching in the table: about 54% are employed among those who do not participate in the courses. This value is about 26% higher than that of the untreated. However, when two homogeneous groups from the point of view of the observed characteristics are matched and then compared, the difference between the two groups drops to 8.7 pp, suggesting that ESF courses significantly reduce the disadvantage of participants in the labour market.

However, the effect at six months is still less than what can be obtained after a longer time. Within six months, there is still what is called the lock-in effect (van Ours, 2004), that is to say, the tendency of those who participate in the courses to seek jobs less actively precisely because they are engaged in the courses.

When the comparison is made on the probability of employment at 12 and 13 months, the situation changes. The gap between treated and untreated becomes positive in favour of the former, even if the difference is not statistically significant. This suggests that the programme succeeded in reducing the employability gap between participants and non-participants. This is a decent result, considering that the program intentionally selects particularly vulnerable subjects. The gap in the probability of finding permanent employment narrows from 6.7 pp to 4 pp, but remains statistically significant in favour of the control group. This suggests that the courses do not affect the likelihood of finding permanent work that much. However, this result is not too surprising, considering the results of the previous studies presented in the literature review above.

For Axis II, given the fragility of the participants, we also calculated a variable showing whether participants, after the ESF course or after enrolling in the PES, had at least one month in which they were employed, regardless of what month it was. For this variable, not only do the recipients have a higher percentage than the controls, but the figure is also statistically significant. In other words, following the course plays an important function of "first insertion" for the participants, favouring a first contact with the labour market in a group of individuals with linguistic, cultural, and social difficulties of job placement.

The table also shows the results that emerged by selecting the group of treated with the Mahalanobis distance method. Overall, this procedure confirms the previous results quite precisely. The program's effect can be noticed from 12 to 13 months following the start of training courses, not earlier (to six months).

From 6 to 12-13 months, the gap between treated and non-treated goes from positive in favour of the latter becoming positive in favour of the former. However, this is still not statistically significant. The effect of the courses on the probability of being employed at least once after the course is found, above all, on the last outcome variable — which moves from negative to positive and is statistically significant for some subgroups of benefit recipients. This confirms the role of participants' reactivation courses, i.e. pushing them to look for work more actively. It is likely that even for Axis II, the availability of observations covering a more prolonged period may positively impact the employability of course participants.

Figure 7 shows the evolution of the employment rate of the two groups after matching. For Axis II, after the matching procedure, the curves of employment rates before the intervention are also very similar between the two groups. In the sixth month after the intervention, there was a sharp jump in the employment rate of the treatment group, peaking around the tenth month. There remains an advantage of 2 to 3 points (as mentioned above) over the control group in the observed period.

[Table 8 here]

[Figure 7 here]

Effects by gender

The following table clearly shows that training courses have an almost zero and not statistically significant effect on men, while they have a positive and also statistically significant effect, although not

with a very high level of statistical significance for women. Women undergoing treatment are about 10% more likely to find employment 13 months after the start of the courses than the control group.

[Table 9 here]

Effects by age

No different impact effects seem to emerge depending on age. With young people, the programme transforms the disadvantage of the treated group compared to the control group into an advantage of about three percentage points, but the effect is not statistically significant. For those over 30, ESF courses have no positive effect, and results are not statistically significant.

[Table 10 here]

Conclusions

The aim of the evaluation exercise was to understand whether, in the case of Axis II, the training courses aimed at diverse groups of recipients and with a strong orientation towards the most vulnerable, affected the employment probability and whether differences emerged for different types of recipients.

For both Axes, six months after the beginning of the courses, the effect is negative, but this is not surprising, as it is in line with the literature that has long detected the existence of a lock-in effect (van Ours, 2004), namely the tendency to look less actively for work when engaged in vocational training courses, and with the fact that the courses financed by the ESF could also last longer.

Moving towards a broader time horizon, 12-13 months, the analysis of the effects of the training courses related to Axis I shows a positive differential for the treated, albeit a small one, in terms of employment rate. The figure is not statistically significant, which does not allow generalizable conclusions. The improvement is particularly significant for women (who have a probability of being employed 8 pp higher than the control group at 12-13 months), foreigners, and to a lesser extent for those who had a higher level of education; on the other hand, there are no differentiated and statistically significant effects by age. The finding of a positive and significant impact (at least with one of the two methods) for women is important as a high share of recipients of Axis I is female (70%). Also important is that the impact analysis reveals a positive effect for immigrants, even if only weakly significant, as they are a large and less equipped group on the labour market.

In the case of Axis II, the general results at 12-13 months do not differ much from those of Axis I, the recipients are in fact 2-3 percentage points more likely to be occupied by the control group, but the results are not statistically significant and therefore not generalizable. Also, for Axis II, it is noted that there seems to be a positive and statistically significant effect for women, albeit weakly. At the same time, there are no age differentiated effects. An important fact for Axis II is that the training courses have offered at least one work experience during the 13 months following the course to the program recipients rather than to the control group. This element suggests that ESF training, given the weakness and disadvantage of the recipients and the strong prevalence of young people, has been useful as a first opportunity to enter the labour market.

Some further observations to better frame the results are useful. First, our analysis focused on a period that, according to the international literature, is still definable as short-term (12 months). In this period, the effects tend to be modest. However, according to our data, the programme's impact turns from

negative six months after the start of the ESF courses to positive after 12-13 months. This may suggest that by having a longer observation period, the effect of the training courses may become more sizeable and even positive. At present, however, the available data does not allow for empirical verification of this theoretical hypothesis.

A second important element to underline is that, especially for Axis II, there were no so-called creaming phenomena (i.e. the selection of people with the highest chance of success in finding a job). Indeed, the opposite is seen, in line with what emerged from interviews with training institutions, which all mentioned the important role of third sector bodies as a support to the identification of potential participants. Moreover, the data on the area of origin of the foreigners of Axis II (i.e., 95% of the total recipients) would seem to support this hypothesis. If this is true, the implications are that while the results highlighted above are considered satisfactory, the work history for these vulnerable subjects might not be sufficient to make the matching perfect and additional information would be needed. Unfortunately, this information (incoming skills, motivation to participate in the course and look for a job, etc.) is not available in the COB archives. Furthermore, for both Axis I and Axis II, it is certain that the monitoring group members did not receive any support from the ESF. However, we do not know whether they have benefited from active labour market interventions financed by other financial resources.

Our study focused on employment effects, especially for particularly weak groups such as those reached by Axis II. However, it would be useful to analyze above all in the short-medium term results of other kinds, such as activation, empowerment of subjects, learning, the creation of social networks, elements that can facilitate social inclusion first and then work. In this sense, some indications for Axis II, have emerged with the variable relating to having had at least one post-intervention work experience, suggesting a role of ESF courses as tools to support social integration, the main aim of Axis II. Ultimately, the Axis II courses represented the first opportunity for job placement, especially thanks to strengthening basic skills, including language skills.

A final element is related to the sectoral structure of the provincial economy. The Province of Bolzano has a high seasonal employment component linked to tourism and its related professions. In this first evaluation exercise, however, we did not have the data on the sectors corresponding to the employment contracts registered in the COB, which could have served to skim the potential control group by eliminating the “fictitious” unemployed of those who register as unemployed only temporarily for a new seasonal job.

These considerations indicate that further investigation may be needed, both to have a larger sample of treated and to verify the program’s effects over a longer period.

In terms of policy, the analyses suggest possible actions to consider. There could be room for improvement in directing course content even more towards labour market demand for Axis I interventions. Although the institutions implement informal market analyses in all courses, the opportunity to “restrict” even more sectors or training areas or other solutions (such as the participation of companies in the design of training) ex-ante could be evaluated. For Axis II, while pre-work training courses have represented an effective tool for social integration, more focused follow-up support actions focussing on work integration actions after training courses should be evaluated.

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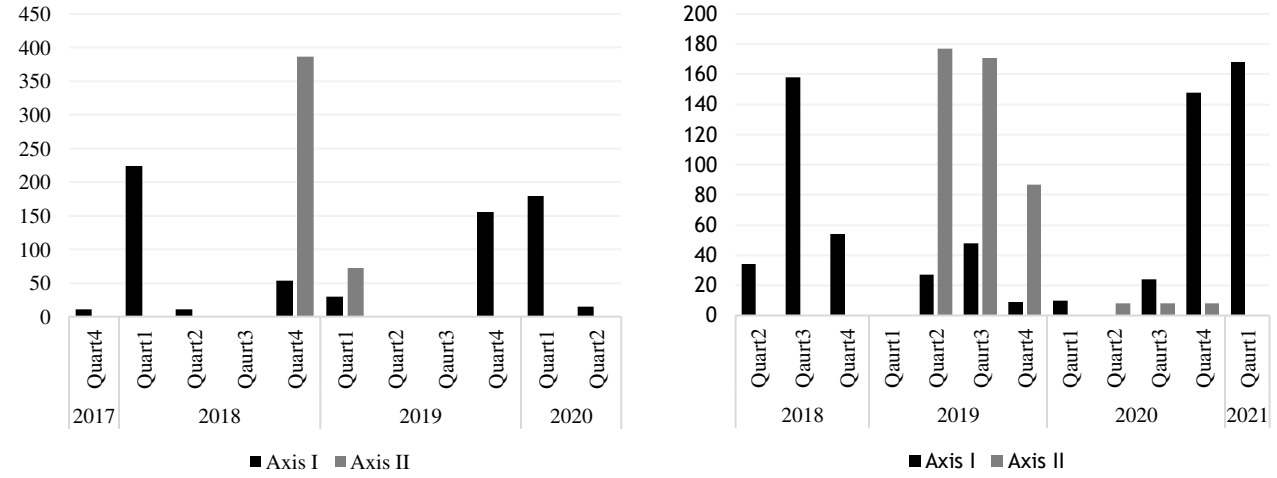
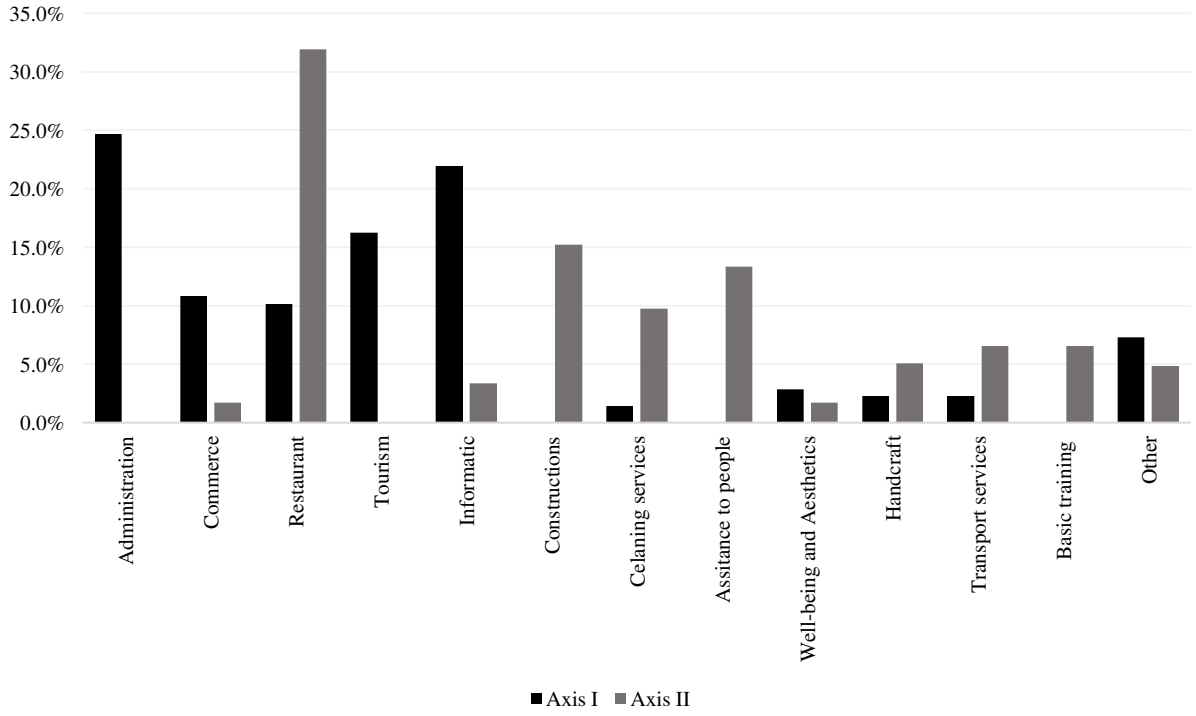
Tables and figures

Figure 1 Start-up (left) and end (right) period of Axis I and Axis II projects



Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Figure 2 Training fields in the ESF courses funded in the two Axes



Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table 1 Socio-demographic characteristics of the treated and of the untreated before matching (Axis I)

Variable	Average Treated (T)	Average not-treated (NT)	Difference between averages (NT-T)	t-test	p>t
Women	0.698	0.570	-0.128	-6.37	0.00
Italian Citizenship	0.620	0.669	0.050	2.61	0.00
Young people under 30 years of age	0.353	0.344	-0.009	-0.47	0.63
Lower middle schools	0.341	0.532	0.191	9.44	0.00
Upper secondary school	0.441	0.405	-0.035	-1.78	0.08
University Degree	0.218	0.062	-0.156	-15.72	0.00
Number of observations	**615**	**61,786**			

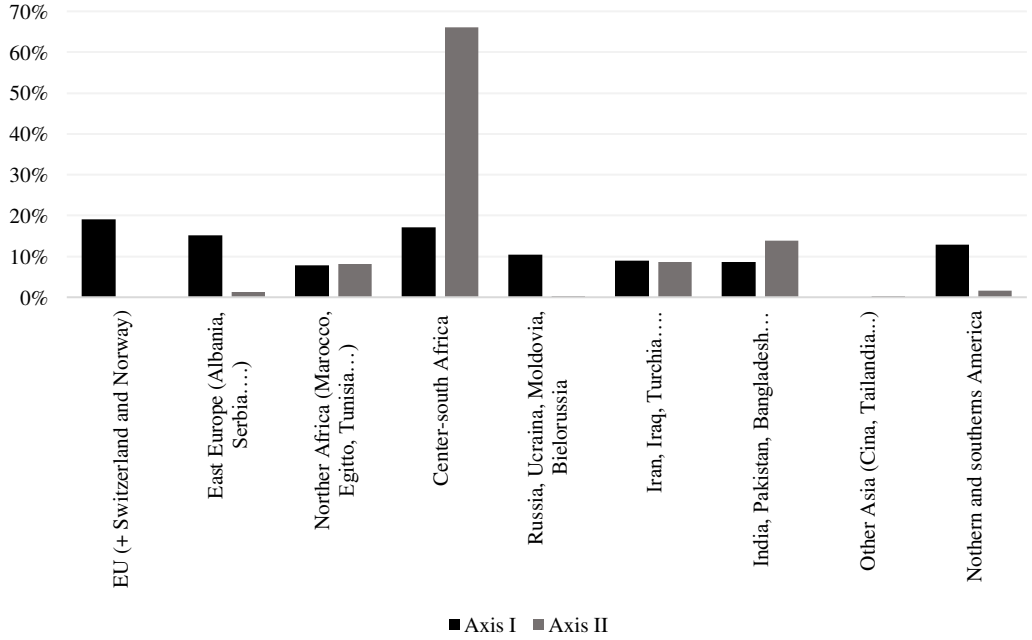
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table 2 Socio-demographic characteristics of the treated and of the untreated before matching (Axis II)

Variable	Average Treated (T)	Average not-treated (NT)	Difference between averages (NT-T)	t-test	p>t
Women	0.261	0.570	0.309	-11.87	0.00
Italian Citizenship	0.047	0.669	0.623	25.2	0.00
Young people under 30 years of age	0.684	0.344	-0.340	-13.63	0.00
Lower middle schools	0.893	0.532	-0.361	-13.77	0.00
Upper secondary school	0.091	0.405	0.315	12.21	0.00
University Degree	0.016	0.062	0.046	-3.62	0.00
Number of observations	**364**	**61,786**			

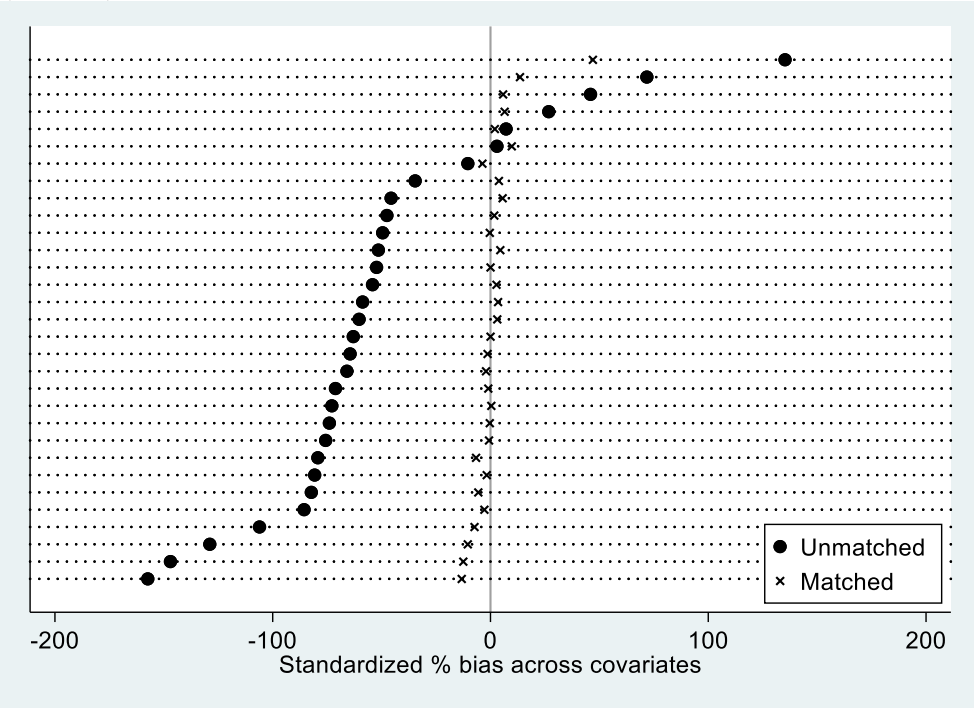
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Figure 3 Foreign participants by area of origin



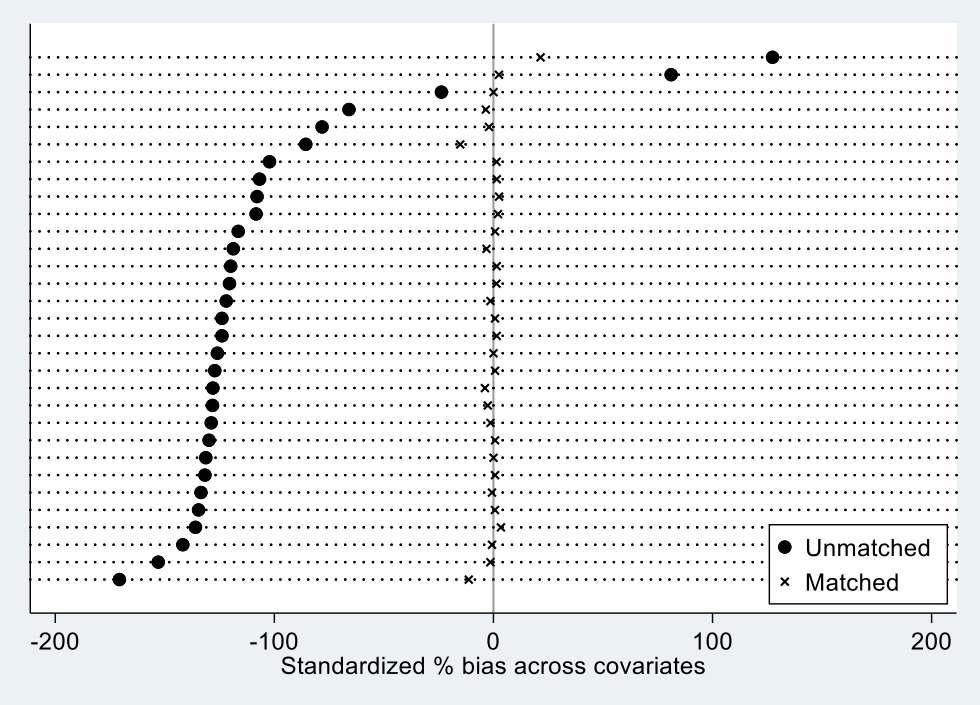
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Figure 4 Differences in the variables used for matching before (black dots) and after matching (crosses) – Mahalanobis method – Axis I



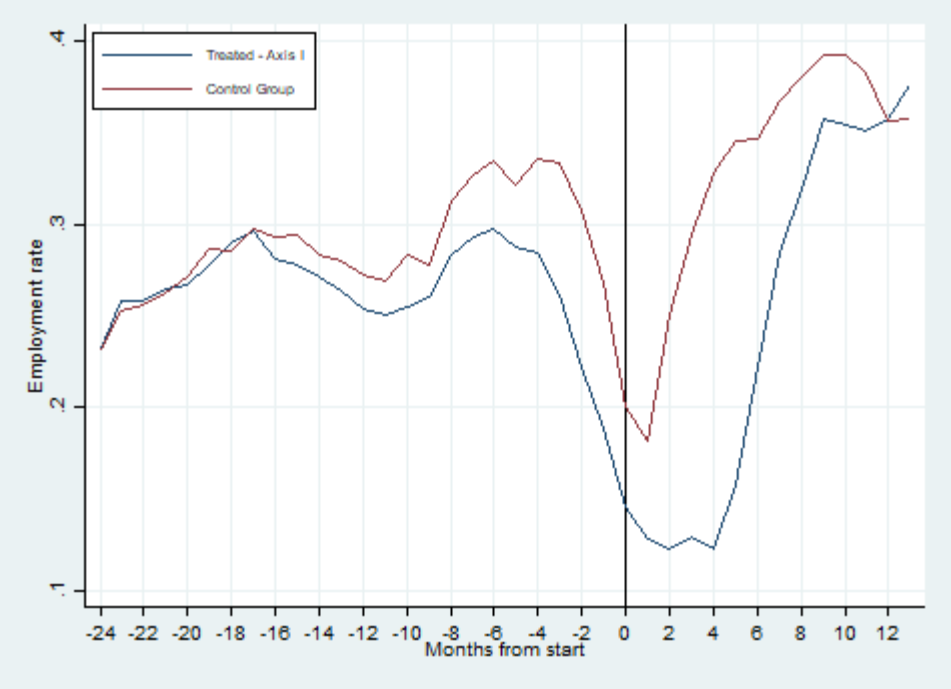
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Figure 5 Differences in variables used for matching before (black dots) and after matching (crosses) – Mahalanobis method – Axis II



Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Figure 6 Evolution of employment shares over the 38 months under observation - after matching – Axis I



Note: NNM 5 obs. method
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table 3 Overall average impacts of Axis I ESF training courses – NNM 5 obs. and Mahalanobis

Variable	Sample	Treated	Control group	Difference	Standard error	Statistic t
NNM with 5 observations						
Employed 6 months after the course	Before matching	0.223	0.537	-0.314	0.020	-15.580
	After matching	0.223	0.331	-0.108	0.021	-5.060
Employed 12 months after the course	Before matching	0.358	0.518	-0.160	0.020	-7.910
	After matching	0.358	0.334	0.023	0.023	1.000
Employed 13 months after the course	Before matching	0.376	0.433	-0.057	0.020	-2.840
	After matching	0.376	0.339	0.036	0.024	1.540
Permanently employed 13 months after the course	Before matching	0.086	0.119	-0.033	0.013	-2.530
	After matching	0.086	0.099	-0.013	0.014	-0.890
Mahalanobis						
Employed 6 months after the course	Before matching	0.223	0.537	-0.314	0.020	-15.58
	After matching	0.223	0.382	-0.159	0.028	-5.72
Employed 12 months after the course	Before matching	0.358	0.518	-0.160	0.020	-7.91
	After matching	0.358	0.380	-0.023	0.030	-0.77
Employed 13 months after the course	Before matching	0.376	0.433	-0.057	0.020	-2.84
	After matching	0.376	0.379	-0.003	0.030	-0.11

Permanently employed 13 months after the course	Before matching	0.086	0.120	-0.033	0.013	-2.53
	After matching	0.086	0.094	-0.008	0.018	-0.46

Note: The estimates are derived from a Propensity Score Matching (PSM) according to the Nearest Neighbor technique with coupling fixed 1 to 5 units and according to the Mahalanobis distance technique. For the calculation of the Propensity Score, a logistic regression model was estimated. The vector of covariates (X_i) is defined by: gender, age, educational qualification, citizenship, monthly work history up to 24 months before, municipality of residence, quarter of entry.
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table 4 Average impacts of Axis I ESF training courses – NNM 5 obs. and Mahalanobis – sex

Variable	Sample	Treated	Control group	Difference	Standard error	T-stat
Women						
NNM with 5 observations						
Employed 13 months after the course	Before matching	0.380	0.413	-0.033	0.024	1.390
	After Matching	0.380	0.300	0.080	0.029	2.740
Mahalanobis						
Employed 13 months after the course	Before matching	0.380	0.413	-0.033	0.024	1.390
	After Matching	0.380	0.373	0.007	0.036	0.200
Men						
NNM with 5 observations						
Employed 13 months after the course	Before matching	0.366	0.458	-0.093	0.037	2.53
	After Matching	0.366	0.403	-0.038	0.051	0.74
Mahalanobis						
Employed 13 months after the course	Before matching	0.366	0.458	-0.093	0.037	-2.53
	After Matching	0.366	0.387	-0.022	0.053	-0.4

Note: The estimates are derived from a Propensity Score Matching (PSM) according to the Nearest Neighbor technique with coupling fixed 1 to 5 units and according to the Mahalanobis distance technique. For the calculation of the Propensity Score, a logistic regression model was estimated. The vector of covariates (X_i) is defined by: gender, age, educational qualification, citizenship, monthly work history up to 24 months before, municipality of residence, quarter of entry.
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table 5 Average impacts of Axis I ESF training courses – NNM 5 obs. and Mahalanobis – education level

Variable	Sample	Treated	Control group	Difference	Standard error	T-stat
	Primary education - NNM with 5 observations					
Employed 13 months after the course	Before matching	0.323	0.409	-0.081	0.034	2.37
	After matching	0.329	0.346	-0.017	0.038	0.45
	Primary education - Mahalanobis					
Employed 13 months after the course	Before matching	0.329	0.409	-0.081	0.034	-2.37
	After matching	0.329	0.348	-0.019	0.049	-0.39
	Secondary education - NNM with 5 observations					
Employed 13 months after the course	Before matching	0.391	0.455	-0.063	0.030	-2.09
	After matching	0.391	0.322	0.069	0.036	1.92

	Secondary education -Mahalanobis					
Employed 13 months after the course	Before matching	0.391	0.455	-0.063	0.030	-2.09
	After matching	0.391	0.384	0.007	0.046	0.16
	Tertiary education - NNM with 5 observations					
Employed 13 months after the course	Before matching	0.418	0.492	-0.074	0.044	-1.69
	After matching	0.418	0.363	0.055	0.053	1.04
	Tertiary education - Mahalanobis					
Employed 13 months after the course	Before matching	0.418	0.492	-0.074	0.044	-1.69
	After Matching	0.418	0.381	0.037	0.064	0.58

Note: The estimates are derived from a Propensity Score Matching (PSM) according to the Nearest Neighbor technique with coupling fixed 1 to 5 units and according to the Mahalanobis distance technique. For the calculation of the Propensity Score, a logistic regression model was estimated. The vector of covariates (X_i) is defined by: gender, age, educational qualification, citizenship, monthly work history up to 24 months before, municipality of residence, quarter of entry.
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table 1 Average impacts of Axis I ESF training courses – NNM 5 obs. and Mahalanobis – citizenship

Variable	Sample	Treated	Control group	Difference	Standard error	T-stat
	Italians - NNM with 5 observations					
Employed 13 months after the course	Before matching	0.370	0.452	-0.082	0.026	3.21
	After matching	0.370	0.342	0.028	0.029	0.97
	Italians - Mahalanobis					
Employed 13 months after the course	Before matching	0.370	0.452	-0.082	0.026	-3.21
	After matching	0.370	0.399	-0.029	0.038	-0.77
	Foreigners - NNM with 5 observations					
Employed 13 months after the course	Before matching	0.385	0.393	-0.008	0.032	-0.26
	After matching	0.385	0.312	0.073	0.053	1.37
	Foreigners - Mahalanobis					
Employed 13 months after the course	Before matching	0.385	0.393	-0.008	0.032	-0.26
	After matching	0.385	0.356	0.026	0.049	0.53

Note: The estimates are derived from a Propensity Score Matching (PSM) according to the Nearest Neighbor technique with coupling fixed 1 to 5 units and according to the Mahalanobis distance technique. For the calculation of the Propensity Score, a logistic regression model was estimated. The vector of covariates (X_i) is defined by: gender, age, educational qualification, citizenship, monthly work history up to 24 months before, municipality of residence, quarter of entry.
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

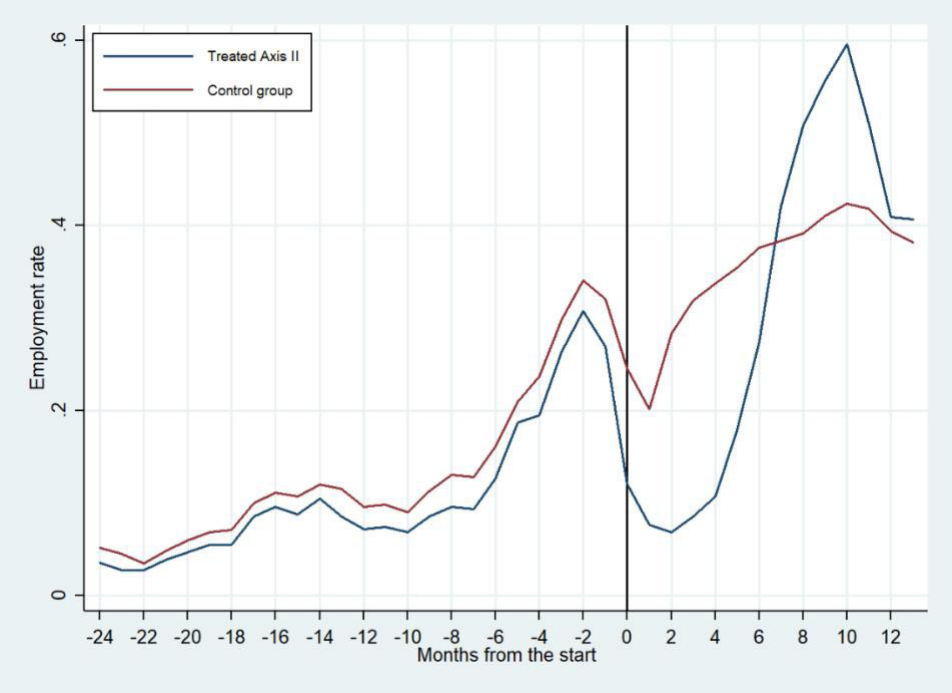
Table 7 Average impacts of Axis I ESF training courses – NNM 5 obs. and Mahalanobis – age

Variable	Sample	Treated	Control group	Difference	Standard error	T-stat
	Young people under 30 years old – NNM with 5 observations					
Employed 13 months after the course	Before matching	0.438	0.456	-0.018	0.034	0.54
	After matching	0.438	0.400	0.038	0.039	0.98

	Young people under 30 years old - Mahalanobis					
Employed 13 months after the course	Before matching	0.438	0.456	-0.018	0.034	-0.54
	After matching	0.438	0.415	0.023	0.050	0.46
	Young people over 30 years old - NNM with 5 observations					
Employed 13 months after the course	Before matching	0.341	0.420	-0.079	0.025	-3.16
	After matching	0.341	0.304	0.038	0.030	1.25
	Young people over 30 years old - Mahalanobis					
Employed 13 months after the course	Before matching	0.341	0.420	-0.079	0.025	-3.16
	After matching	0.341	0.387	-0.045	0.036	-1.27

Note: The estimates are derived from a Propensity Score Matching (PSM) according to the Nearest Neighbor technique with coupling fixed 1 to 5 units and according to the Mahalanobis distance technique. For the calculation of the Propensity Score, a logistic regression model was estimated. The vector of covariates (X_i) is defined by: gender, age, educational qualification, citizenship, monthly work history up to 24 months before, municipality of residence, quarter of entry.
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Figure 7 Evolution of employment shares over the 38 months under observation - after matching – Axis II



Note: NNM 5 obs. method
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table 2 Overall average impacts of Axis II ESF training courses – NNM 5 obs. and Mahalanobis

Variable	**Average treated (T)**	**Untreated media (NT)**	**Difference between averages (NT-T)**	**t-test**	**p>t**	**Variable**
NNM with 5 observations						
Employed 6 months after the course	Before matching	0.275	0.537	-0.262	0.026	-10.02

	After matching	0.275	0.362	-0.087	0.029	-3.06
Employed 12 months after the course	Before matching	0.409	0.518	-0.109	0.026	-4.13
	After matching	0.409	0.392	0.017	0.031	0.56
Employed 13 months after the course	Before matching	0.407	0.433	-0.026	0.026	-1
	After matching	0.407	0.382	0.024	0.031	0.79
Permanently employed 13 months after the course	Before matching	0.052	0.119	-0.067	0.017	-3.95
	After matching	0.052	0.092	-0.040	0.015	-2.62
Employed at least once after the course	Before matching	0.739	0.768	-0.029	0.022	-1.3
	After matching	0.739	0.676	0.063	0.028	2.27
Mahalanobis						
Employed 6 months after the course	Before matching	0.275	0.537	-0.262	0.026	-10.02
	After matching	0.275	0.357	-0.082	0.045	-1.82
Employed 12 months after the course	Before matching	0.409	0.518	-0.109	0.026	-4.13
	After matching	0.409	0.451	-0.041	0.048	-0.86
Employed 13 months after the course	Before matching	0.407	0.433	-0.026	0.026	-1
	After matching	0.407	0.379	0.027	0.047	0.58
Permanently employed 13 months after the course	Before matching	0.052	0.119	-0.067	0.017	-3.95
	After matching	0.052	0.088	-0.036	0.024	-1.47
Employed at least once after the course	Before matching	0.739	0.768	-0.029	0.022	-1.3
	After matching	0.739	0.654	0.085	0.044	1.93

Note: The estimates are derived from a Propensity Score Matching (PSM) according to the Nearest Neighbor technique with coupling fixed 1 to 5 units and according to the Mahalanobis distance technique. For the calculation of the Propensity Score, a logistic regression model was estimated. The vector of covariates (X_i) is defined by: gender, age, educational qualification, citizenship, monthly work history up to 24 months before, municipality of residence, quarter of entry.
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table 9 Average impacts of Axis II ESF training courses – NNM 5 obs. and Mahalanobis – sex

Variable	Sample	Treated	Control group	Difference	standard error	T-stat
Women						
NNM with 5 observations						
Employed 13 months after the course	Before matching	0.326	0.413	-0.087	0.051	1.72
	After matching	0.326	0.221	0.105	0.055	1.91
Mahalanobis						
Employed 13 months after the course	Before matching	0.326	0.413	-0.087	0.051	-1.72
	After matching	0.326	0.232	0.095	0.077	1.22
Men						
NNM with 5 observations						
Employed 13 months after the course	Before matching	0.435	0.458	-0.023	0.031	-0.77

	After matching	0.435	0.418	0.017	0.036	0.48
Mahalanobis						
Employed 13 months after the course	Before matching	0.435	0.458	-0.023	0.031	-0.77
	After matching	0.435	0.431	0.004	0.057	0.07

Note: The estimates are derived from a Propensity Score Matching (PSM) according to the Nearest Neighbor technique with coupling fixed 1 to 5 units and according to the Mahalanobis distance technique. For the calculation of the Propensity Score, a logistic regression model was estimated. The vector of covariates (X_i) is defined by: gender, age, educational qualification, citizenship, monthly work history up to 24 months before, municipality of residence, quarter of entry.
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table 10 Average impacts of Axis II ESF training courses – NNM 5 obs. and Mahalanobis – age

Variable	**Sample**	**Treated**	**Control group**	**Difference**	**standard error**	**T-stat**
Young people under 30						
NNM with 5 observations						
Employed 13 months after the course	Before matching	0.442	0.456	-0.014	0.032	-0.45
	After matching	0.442	0.406	0.036	0.039	0.92
Mahalanobis						
Employed 13 months after the course	Before matching	0.442	0.456	-0.014	0.032	-0.45
	After matching	0.442	0.418	0.024	0.057	0.42
Adults over 30						
NNM with 5 observations						
Employed 13 months after the course	Before matching	0.330	0.420	-0.090	0.046	-1.95
	After matching	0.330	0.348	-0.017	0.050	-0.34
Mahalanobis						
Employed 13 months after the course	Before matching	0.330	0.420	-0.090	0.046	-1.95
	After matching	0.330	0.365	-0.035	0.072	-0.48

Note: The estimates are derived from a Propensity Score Matching (PSM) according to the Nearest Neighbor technique with coupling fixed 1 to 5 units and according to the Mahalanobis distance technique. For the calculation of the Propensity Score, a logistic regression model was estimated. The vector of covariates (X_i) is defined by: gender, age, educational qualification, citizenship, monthly work history up to 24 months before, municipality of residence, quarter of entry.
Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

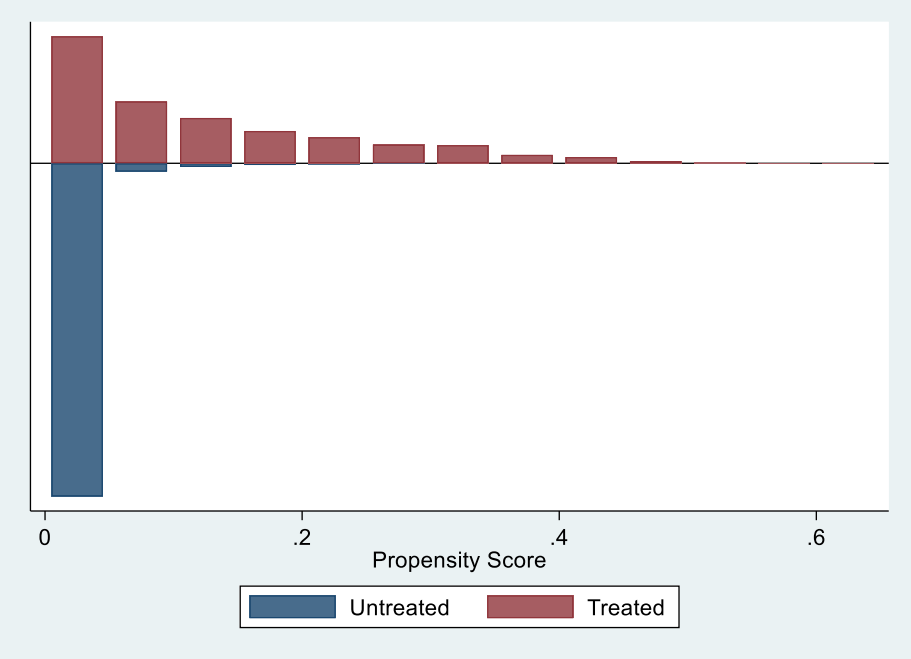
Appendices

Table A1 Testing of differences between independent variables in the treatment and control group before and after matching – NNM 5 Obs. method – Axis I

	Average values		t-test	V(T)/
Variable	**Treated Controls**	**%bias**	**t p>t**	**V(C)**
% Woman	.69756 .66992	5.800	1.04 0.298	.
Age	37.647 36.407	10.000	1.73 0.083	0.950
% High school degree	.44065 .42439	3.300	0.58 0.565	.
% University degree	.21789 .24163	-7.000	-0.99 0.323	.
% Italian	.61951 .61691	0.500	0.09 0.925	.
% Residents Municipality Bolzano	.49756 .51837	-4.700	-0.73 0.466	.
Quarter of starting	13.459 13.468	-0.200	-0.04 0.964	0.82*
% employed 24 months before	.23252 .20228	6.500	1.29 0.199	.
% employed 23 months before	.25854 .22602	7.000	1.33 0.183	.
% employed 22 months before	.25854 .22764	6.600	1.26 0.207	.
% employed 21 months before	.26504 .22894	7.700	1.47 0.142	.
% employed 20 months before	.26667 .23772	6.100	1.17 0.243	.
% employed 19 months before	.27805 .25106	5.700	1.07 0.284	.
% employed 18 months before	.28943 .24976	8.300	1.57 0.117	.
% employed 17 months before	.29593 .26341	6.800	1.27 0.204	.
% employed 16 months before	.2813 .25041	6.500	1.23 0.220	.
% employed 15 months before	.27805 .25106	5.800	1.07 0.284	.
% employed 14 months before	.27154 .23512	7.800	1.47 0.142	.
% employed 13 months before	.26341 .23317	6.500	1.23 0.220	.
% employed 12 months before	.25366 .22699	5.700	1.09 0.274	.
% employed 11 months before	.25041 .22634	5.100	0.99 0.322	.
% employed 10 months before	.25528 .2361	4.100	0.78 0.435	.
% employed 09 months before	.26016 .22114	8.400	1.60 0.110	.
% employed 08 months before	.28293 .25333	6.400	1.17 0.242	.
% employed 07 months before	.29268 .26894	5.200	0.93 0.355	.
% employed 06 months before	.29756 .27707	4.400	0.79 0.428	.
% employed 05 months before	.2878 .26211	5.500	1.01 0.313	.
% employed 04 months before	.28455 .27089	3.100	0.53 0.593	.
% employed 03 months before	.26179 .26049	0.300	0.05 0.959	.
% employed 02 months before	.22276 .23154	-2.200	-0.37 0.714	.
% employed 01 months before	.18862 .19837	-2.5	-0.43 0.665	.

Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Figure A1 Common support in PSM estimates, for the variable employed at 13 months – NNM 5 Obs. method – Axis I



Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table A2 Testing of differences between independent variables in the treatment and control group before and after matching - Mahalnobis Method – Axis I

	U= Unmatched	Average		% reduct	t-test	V(T)/
Variable	**M= Matched**	**Treated Controls**	**%bias**	**bias**	**t p>t**	**V(C)**
% Woman	U	.69756 .56983	26.7		6.37 0.000	.
	M	.69756 .66667	6.5	75.8	1.16 0.245	.
Age	U	37.647 37.281	3		0.73 0.465	1.01
	M	37.647 36.444	9.7	-229.1	1.75 0.081	1.11
% High school degree	U	.44065 .40529	7.2		1.78 0.076	.
	M	.44065 .43089	2	72.4	0.34 0.730	.
% University degree	U	.21789 .06238	45.9		15.72 0.000	.
	M	.21789 .19837	5.8	87.5	0.84 0.400	.
% Italian	U	.61951 .66929	-10.4		-2.61 0.009	.
	M	.61951 .6374	-3.7	64.1	-0.65 0.517	.
% Residents Municipality Bolzano	U	.49756 .17784	71.8		20.56 0.000	.
	M	.49756 .4374	13.5	81.2	2.12 0.034	.
Quarter of starting	U	13.459 7.443	135.3		28.53 0.000	0.45*
	M	13.459 11.369	47	65.3	8.86 0.000	0.56*
% employed 24 months before	U	.23252 .47455	-52.3		-11.98 0.000	.
	M	.23252 .23252	0	100	0.00 1.000	.
% employed 23 months before	U	.25854 .41997	-34.6		-8.08 0.000	.
	M	.25854 .24065	3.8	88.9	0.72 0.469	.
% employed 22 months before	U	.25854 .47295	-45.6		-10.61 0.000	.
	M	.25854 .23252	5.5	87.9	1.06 0.290	.
% employed 21 months before	U	.26504 .5079	-51.5		-12.00 0.000	.
	M	.26504 .2439	4.5	91.3	0.85 0.395	.
% employed 20 months before	U	.26667 .54334	-58.7		-13.72 0.000	.
	M	.26667 .25041	3.5	94.1	0.65 0.515	.

% employed 19 months before	U	.27805 .56327	-60.3		-14.20 0.000	.
	M	.27805 .26341	3.1	94.9	0.58 0.564	.
% employed 18 months before	U	.28943 .54742	-54.2		-12.80 0.000	.
	M	.28943 .27642	2.7	95	0.51 0.613	.
% employed 17 months before	U	.29593 .5236	-47.6		-11.26 0.000	.
	M	.29593 .2878	1.7	96.4	0.31 0.754	.
% employed 16 months before	U	.2813 .5854	-64.5		-15.24 0.000	.
	M	.2813 .2878	-1.4	97.9	-0.25 0.801	.
% employed 15 months before	U	.27805 .61146	-71.2		-16.89 0.000	.
	M	.27805 .28293	-1	98.5	-0.19 0.849	.
% employed 14 months before	U	.27154 .61638	-74		-17.51 0.000	.
	M	.27154 .27317	-0.3	99.5	-0.06 0.949	.
% employed 13 months before	U	.26341 .61487	-75.7		-17.84 0.000	.
	M	.26341 .26667	-0.7	99.1	-0.13 0.897	.
% employed 12 months before	U	.25366 .56141	-65.9		-15.32 0.000	.
	M	.25366 .26341	-2.1	96.8	-0.39 0.696	.
% employed 11 months before	U	.25041 .48208	-49.5		-11.45 0.000	.
	M	.25041 .25203	-0.3	99.3	-0.07 0.948	.
% employed 10 months before	U	.25528 .55012	-63		-14.64 0.000	.
	M	.25528 .25528	0	100	0.00 1.000	.
% employed 9 months before	U	.26016 .59905	-72.8		-17.08 0.000	.
	M	.26016 .25854	0.3	99.5	0.07 0.948	.
% employed 8 months before	U	.28293 .65672	-80.7		-19.44 0.000	.
	M	.28293 .29106	-1.8	97.8	-0.31 0.753	.
% employed 7 months before	U	.29268 .68616	-85.6		-20.93 0.000	.
	M	.29268 .30569	-2.8	96.7	-0.50 0.619	.
% employed 6 months before	U	.29756 .678	-82.3		-20.10 0.000	.
	M	.29756 .32358	-5.6	93.2	-0.99 0.325	.
% employed 5 months before	U	.2878 .65583	-79.3		-19.12 0.000	.
	M	.2878 .3187	-6.7	91.6	-1.18 0.239	.
% employed 4 months before	U	.28455 .75286	-106.1		-26.78 0.000	.
	M	.28455 .31707	-7.4	93.1	-1.24 0.214	.
% employed 3 months before	U	.26179 .80254	-128.9		-33.48 0.000	.
	M	.26179 .30569	-10.5	91.9	-1.71 0.088	.
% employed 2 months before	U	.22276 .81463	-147		-37.56 0.000	.
	M	.22276 .27317	-12.5	91.5	-2.05 0.041	.
% employed 1 month before	U	.18862 .80711	-157.4		-38.68 0.000	.
	M	.18862 .24065	-13.2	91.6	-2.23 0.026	.

Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table A3 Testing of differences between independent variables in the treated and control group after matching – NNM 5 Obs. method – Axis II

	Average values		**t-test**	**V(T)/**
Variable	**Treated Controls**	**%bias**	**t p>t**	**V(C)**
% Woman	.26099 .26099	0	0.00 1.000	.
Age	28.364 28.884	-5	-0.81 0.419	0.75*
% High school degree	.09066 .1	-2.3	-0.43 0.668	.
% University degree	.01648 .01758	-0.6	-0.11 0.909	.
% Italian	.0467 .05549	-2.4	-0.54 0.591	.
% residents Municipality Bolzano	.53846 .50385	7.8	0.93 0.351	.
Quarter of starting	12.154 12.741	-15.9	-2.76 0.006	0.01*
% employed 24 months before	.03571 .04176	-1.6	-0.42 0.673	.
% employed 23 months before	.02747 .03297	-1.5	-0.43 0.666	.
% employed 22 months before	.02747 .02473	0.7	0.23 0.816	.

% employed 21 months before	.03846 .03681	0.4	0.12 0.907	.
% employed 20 months before	.0467 .05	-0.9	-0.21 0.836	.
% employed 19 months before	.05495 .05659	-0.4	-0.10 0.923	.
% employed 18 months before	.05495 .05879	-1	-0.22 0.823	.
% employed 17 months before	.08516 .08791	-0.7	-0.13 0.895	.
% employed 16 months before	.09615 .09945	-0.8	-0.15 0.881	.
% employed 15 months before	.08791 .09121	-0.8	-0.16 0.876	.
% employed 14 months before	.1044 .10385	0.1	0.02 0.981	.
% employed 13 months before	.08516 .09725	-3	-0.57 0.572	.
% employed 12 months before	.07143 .08077	-2.4	-0.47 0.635	.
% employed 11 months before	.07418 .08297	-2.2	-0.44 0.660	.
% employed 10 months before	.06868 .07308	-1.1	-0.23 0.818	.
% employed 09 months before	.08516 .09011	-1.2	-0.24 0.814	.
% employed 08 months before	.09615 .10549	-2.4	-0.42 0.676	.
% employed 07 months before	.09341 .10275	-2.4	-0.42 0.672	.
% employed 06 months before	.12637 .13626	-2.4	-0.39 0.693	.
% employed 05 months before	.18681 .18187	1.1	0.17 0.864	.
% employed 04 months before	.19505 .20055	-1.3	-0.19 0.853	.
% employed 03 months before	.26374 .25604	1.8	0.24 0.813	.
% employed 02 months before	.30769 .30495	0.6	0.08 0.936	.
% employed 01 months before	.26923 .28297	-3.3	-0.41 0.679	.

Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Figure A2 Common support in PSM estimates, for the variable employed at 13 months – NNM 5 Obs. method – Axis II

Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.

Table A4 Testing of differences between independent variables in the treated and control group before and after matching - Mahalnobis Method – Axis II

	U= Unmatched	Average		%reduct	t-test	V(T)/

Variable	M= Matched	Treated Controls	%bias	bias	t p>t	V(C)
% Woman	U	.26099 .56983	-66		-11.87 0.000	.
	M	.26099 .27747	-3.5	94.7	-0.50 0.617	.
Age	U	28.364 37.281	-85.7		-13.78 0.000	0.43*
	M	28.364 29.945	-15.2	82.3	-2.46 0.014	0.75*
% High school degree	U	.09066 .40529	-78.2		-12.21 0.000	.
	M	.09066 .0989	-2	97.4	-0.38 0.705	.
% University degree	U	.01648 .06238	-23.7		-3.62 0.000	.
	M	.01648 .01648	0	100	0.00 1.000	.
% Italian	U	.0467 .66929	-170.7		-25.23 0.000	.
	M	.0467 .08791	-11.3	93.4	-2.22 0.027	.
% Residents Municipality Bolzano	U	.53846 .17784	81.1		17.90 0.000	.
	M	.53846 .52747	2.5	97	0.30 0.767	.
Quarter of starting	U	12.154 7.443	127.4		17.22 0.000	0.00*
	M	12.154 11.36	21.5	83.1	5.16 0.000	0.02*
% employed 24 months before	U	.03571 .47455	-116.5		-16.76 0.000	.
	M	.03571 .03297	0.7	99.4	0.20 0.839	.
% employed 23 months before	U	.02747 .41997	-106.7		-15.17 0.000	.
	M	.02747 .02198	1.5	98.6	0.48 0.634	.
% employed 22 months before	U	.02747 .47295	-119.9		-17.02 0.000	.
	M	.02747 .02198	1.5	98.8	0.48 0.634	.
% employed 21 months before	U	.03846 .5079	-123.9		-17.91 0.000	.
	M	.03846 .03297	1.5	98.8	0.40 0.690	.
% employed 20 months before	U	.0467 .54334	-129.8		-19.01 0.000	.
	M	.0467 .04396	0.7	99.4	0.18 0.859	.
% employed 19 months before	U	.05495 .56327	-131.7		-19.54 0.000	.
	M	.05495 .0522	0.7	99.5	0.16 0.869	.
% employed 18 months before	U	.05495 .54742	-127.2		-18.86 0.000	.
	M	.05495 .0522	0.7	99.4	0.16 0.869	.
% employed 17 months before	U	.08516 .5236	-108.3		-16.73 0.000	.
	M	.08516 .07692	2	98.1	0.41 0.684	.
% employed 16 months before	U	.09615 .5854	-120.5		-18.93 0.000	.
	M	.09615 .09066	1.4	98.9	0.25 0.799	.
% employed 15 months before	U	.08791 .61146	-131.3		-20.47 0.000	.
	M	.08791 .08791	0	100	-0.00 1.000	.
% employed 14 months before	U	.1044 .61638	-126		-20.06 0.000	.
	M	.1044 .1044	0	100	-0.00 1.000	.
% employed 13 months before	U	.08516 .61487	-133.5		-20.75 0.000	.
	M	.08516 .08791	-0.7	99.5	-0.13 0.895	.
% employed 12 months before	U	.07143 .56141	-123.9		-18.82 0.000	.
	M	.07143 .06868	0.7	99.4	0.15 0.885	.
% employed 11 months before	U	.07418 .48208	-102.2		-15.56 0.000	.
	M	.07418 .06868	1.4	98.7	0.29 0.774	.
% employed 10 months before	U	.06868 .55012	-122		-18.45 0.000	.
	M	.06868 .07418	-1.4	98.9	-0.29 0.774	.
% employed 9 months before	U	.08516 .59905	-128.8		-19.99 0.000	.
	M	.08516 .09066	-1.4	98.9	-0.26 0.794	.
% employed 8 months before	U	.09615 .65672	-141.8		-22.50 0.000	.
	M	.09615 .0989	-0.7	99.5	-0.12 0.901	.
% employed 7 months before	U	.09341 .68616	-153		-24.34 0.000	.
	M	.09341 .0989	-1.4	99.1	-0.25 0.802	.
% employed 6 months before	U	.12637 .678	-136		-22.49 0.000	.
	M	.12637 .11264	3.4	97.5	0.57 0.568	.
% employed 5 months before	U	.18681 .65583	-107.9		-18.80 0.000	.
	M	.18681 .17582	2.5	97.7	0.38 0.701	.

% employed 4 months before	U	.19505 .75286	-134.6		-24.61 0.000	.
	M	.19505 .19231	0.7	99.5	0.09 0.925	.
% employed 3 months before	U	.26374 .80254	-128.2		-25.73 0.000	.
	M	.26374 .27473	-2.6	98	-0.33 0.739	.
% employed 2 months before	U	.30769 .81463	-118.7		-24.79 0.000	.
	M	.30769 .32143	-3.2	97.3	-0.40 0.690	.
% employed 1 month before	U	.26923 .80711	-128		-25.91 0.000	.
	M	.26923 .28571	-3.9	96.9	-0.50 0.620	.

Source: Our elaborations on monitoring and administrative data provided by the Province of Bolzano.