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# ESF Supporting Youth in Portugal CIE of Vocational Training and Traineeships

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# Executive Summary

## Short description of the project

The 2014-2020 programming period is much more demanding for the Member States in terms of demonstrating the net effects (impacts) of the programmes. Although the impact evaluation of a programme can be achieved through different methodologies, rigorous quantification of the intervention impacts requires counterfactual analyses. To deepen the knowledge about counterfactual evaluation methodologies in the context of ESF interventions, this project has studied the impact of two programmes, both directed to young people:

- **The Traineeship Programme** - created in 1997 with the aim of facilitating youngsters' transition from the educational / vocational training system to the labour market, offer participants the opportunity to spend a period varying from 9 to 12 months in an institution of the private or public sector where they will receive on-the-job training. The programme targets unemployed individuals below the age of 30 (35 between 2009 and 2011) that are first-time job seekers and other unemployed individuals that may have obtained better qualifications and failed to find a suitable occupation.
- **The Vocational Education Programme** - constitutes an alternative to scientific-humanistic programmes, which curricula includes general academic subjects oriented to prepare students for higher education. At present, the goals of Vocational Education in Portugal are: (i) to reduce early-school leaving, (ii) to improve the match between skills' supply and demand, and (iii) to expand the possible choices of programmes in high-schools, in order to meet different profiles and interests of students. Although Vocational education main priority is to facilitate individuals' entrance in the labour market, students are allowed to proceed to higher education.

Regarding the information about the amount of the ESF spent for the evaluated interventions, and taking into account all the 2007-2013 program period (amounts considered till 31 October 2015), the figures are (for Portugal mainland – excluding the Madeira and Azores islands):

	<b>TOTAL €</b>	<b>National Co-funding Approved €</b>	<b>ESF Funding Approved €</b>	<b>% of the total of ESF funding</b>
<b>Vocational Education</b>	1.770.116.035,10	399.158.491,72	1.360.747.204,97	21%
<b>Traineeships</b>	413.552.067,49	124.065.620,23	289.486.447,26	4%
<b>Total</b>	2.183.668.102,59	523.224.111,95	1.650.233.652,23	25%

These amounts don't match with the evaluations periods. Regarding the traineeships programme, the focus of the counterfactual evaluation is between 2007 and 2013 (with programme data since 2004, allowing for historical information to be gathered for, at least, 2 years prior to treatment). For the vocational education programme, the counterfactual evaluation applies to the scholar years from 2008 to 2011.

However, the amounts above, transmit the real importance of ESF funding for the achievement of these two public interventions

The project was led by the Cohesion and Development Agency – the public organization that coordinates the Cohesion Policy funds (European Regional Development Fund, European Social Fund and Cohesion Fund) – in partnership with some of the most relevant public agencies responsible for the implementation of the evaluated programmes and/or producers of relevant information regarding individuals performance in those programmes.

The counterfactual analysis was carried out by experienced researchers in this field, from two Portuguese universities FEP - University of Oporto; and ISCTE - University Institute of Lisbon.

The project included as well capacity building actions on counterfactual impact evaluation methods, led by the researchers, for the project partners' public agencies and the management authorities of the Operational Programs 2014-2020.

### **Main objectives of the project**

In recent years, the Portuguese authorities responsible for the coordination, management, monitoring and evaluation of the ESF have made considerable efforts to improve knowledge

regarding the impact of ESF policies. However, this type of impact evaluation is still far from being a common practice. It is clear for us that both the public agencies that produce administrative data and those that operationalise public policies need to be involved in the efforts of deepening the knowledge on counterfactual methodologies.

For these reasons, the project "ESF Supporting Youth in Portugal CIE of Vocational Training and Traineeships" proposed two main objectives:

1 - To contribute to strengthen the knowledge on counterfactual approaches of impact evaluation of ESF interventions, by bringing together:

- the main public body involved in the monitoring and evaluation of the ESF in Portugal: the Cohesion and Development Agency;
- the public institutions responsible for vocational training and traineeship programs and/or related statistical data (IEFP - Institute for Employment and Vocational Training, IISS - Institute for Informatics of Social Security, and DGEEC - DG for Statistics on Education and Science and GEP - Office of Strategy and Planning, Ministry of Solidarity, Labour and Social Security);
- the researchers from two Portuguese universities (University of Porto and ISCTE - University Institute of Lisbon), who recently carried out other studies of counterfactual impact evaluation of policies financed by the ESF in Portugal.

2 - To contribute to a more accurate and detailed knowledge about the impact of vocational training and traineeships public policies, financed by ESF in Portugal, using any appropriate counterfactual impact evaluation approach.

## **Key results**

### **1 - Institutional collaboration and capacity building on counterfactual impact evaluation**

- Greater awareness by the Operational Programmes' managing authorities about the advantages of counterfactual impact evaluation and its planning and data requirements. This greater awareness will certainly improve the evaluation process of the current

programming period 2014-2020 and result henceforth, in the inscription of an additional six counterfactual impact evaluations under the Global Plan Evaluation 2014-2020 (three of them regarding ESF financed interventions);

- Improvement of technical staff's skills in public agencies partners on counterfactual approaches for policy impact evaluation, and knowledge on its usefulness and limitations;
- Active involvement of the agencies that provide data in the design and implementation of impact evaluation studies – rather than merely providing information – which increases their sense of ownership of the project;
- Confidence building among the project partners, which allowed to simplify the share of information and finding solutions to delicate problems (e.g., the need to comply with the principle of statistical secrecy while enabling the analysis of data from different sources);
- Empirical demonstration that it is possible to implement collaborative practices and administrative data sharing among public agencies for policy impact evaluation purposes;
- Awareness of how these collaborative practices pave the way for similar future impact evaluation studies.

## **2 - Knowledge deepening about the impacts of vocational training and traineeships public policies, financed by ESF, in Portugal**

Regarding students' **academic performance**, the counterfactual study has concluded that **the vocational education policy** has positive impacts in grade transition and high school graduation; and null or negative impacts in dropout rates and access to higher education (all impact coefficients are statistically significant). More concretely, vocational education:

- increased by 24 percentage points the probability of transition from the 10<sup>th</sup> to the 11<sup>th</sup> grade in  $t$ ;
- increased by 31 percentage points the probability of transition from the 10<sup>th</sup> to the 12<sup>th</sup> grade within two years, and by 36 percentage points the probability of high school graduation by the end of  $t+2$ ;

- regarding enrolment in higher education after  $t+2$ , vocational education seems to decrease the probability of participation in post-secondary studies by 12 percentage points;
- had negligible impact on dropout rates in the first two years of high school.

Regarding the **labour market performance**, the counterfactual study has concluded that vocational education has positive and statistically significant impacts on the probability of being employed after high school graduation; and moderate impacts in labour market quality variables (all impact coefficients are statistically significant). More concretely, vocational education:

- increased the probability of being employed within the next 12 months (during  $t+3$ ) by 25 percentage points, for students who graduated from high-school and did not proceed to higher education;
- increased the average daily remuneration by one euro (i.e., 30eur/month, 360eur/year);
- increased the average number of days worked per month by 1,6 days (i.e., 19 days/year);
- the number of months worked after graduation was, on average, one month higher for vocational education students.

These results suggest that individuals who graduate from vocational education programmes and do not proceed to higher education not only have a higher probability of being employed after graduation (as compared to individuals in similar circumstances who graduated from scientific-humanistic programmes), but the jobs they find are also of slightly higher quality. In this sense, and considering VE's focus on employability, it is possible to conclude that this education policy is accomplishing its initial goals.

Regarding the **traineeships policy**, the counterfactual study has concluded that:

- while having a severe lock-in effect in the first 9-12 months since entry to the programme, traineeships significantly raise the employment probability of the treated relatively to the non-treated (by 10 to 20 percentage points) and that this effect persists for the most part for a relatively long period (two years).

- significant variation in the programme effectiveness between male and female participants, the most positive effects being found in the case of men.
- no significant differences were found for different schooling subgroups. This later result somehow validates the political decision to increasingly extend the programme to more workers without university education.
- positive effects of the programme are not hindered by difficult labor market conditions - the results are equally as positive during the period of high and rising unemployment and in regions with fewer employment opportunities.

In view of the results of the two counterfactual evaluations, the Cohesion and Development Agency, as project coordinator, recognizes the importance of promoting the dissemination of the results at different levels – policy makers, public agencies responsible for programme implementation, Operational Programme Managing Authorities, evaluators and researchers, media and citizens. Therefore, in addition to the actions already achieved, the Cohesion and Development Agency is planning to proceed with implementing concrete training and dissemination actions in the last quarter of 2015 (see page 65).

I  
**Counterfactual Impact Evaluation of Vocational Training  
Programme**

## 1. Introduction

Portugal has underperformed in education for a long time, compared with other high living-standard countries. In 2014, 43% of the population between 15 and 64 years old had completed upper secondary education. Although this represents a substantial improvement from historical low levels (e.g., 20% in 1992), it is still the second lowest value in the OECD (just above Turkey), leaving Portugal far below the EU average (72,5%).

Moreover, among the population aged 18-24, the rate of early leavers from education and training remains high (17,7% in 2014) compared with the EU average (11,3% in 2014), despite substantial improvements in the past decade (it was 38.5% in 2006). The recent reduction in school dropout among young Portuguese is commonly associated with the 2004 decision by the Portuguese Government to expand the offer of vocational courses in public high schools (ISCED 3). This reform, mainly funded by the European Social Fund, aimed to expand and diversify vocational education programmes and to reduce early-school leaving.

The purpose of our study is to estimate the impacts of this reform on students' academic and labour market outcomes, using a counterfactual approach. In particular, we look at the effects of the policy on individuals' academic progression during high school (including graduation and dropout), as well as on the subsequent enrolment in higher education and on employability after high-school graduation.

Our results confirm that enrolling in vocational education (VE) in high-school increases the chances of educational success as compared to the alternative of enrolling in scientific-humanistic education (SHE) programmes. We also find that VE has a positive impact on individuals' performance in the labour market, following graduation from high school.

It should be noted that these results refer to a relatively small subset of the total population of vocational educational (VE) students in Portugal, for three reasons. First, since we are interested in assessing the impact of the expansion of vocational courses in the public secondary school system, we exclude from the analysis all private schools and special public

schools (e.g., professional schools under the tutelage of sectorial ministries), which represent nearly 2/5 of VE students in Portugal. Second, due to data restrictions, our study excludes foreign students, who account for nearly 10% of VE students. Finally, we decided to exclude from the analysis those VE students with observable characteristics that are rarely found among SHE students, namely: individuals over 18 years old, and students who were already enrolled in VE programmes in previous years (nearly 30% of VE population).

In sum, the treatment group under analysis represents about 1/4 of the total population of VE students in Portugal and about 4/5 of VE students enrolled in the regular public school system (which was the target of the policy reform under analysis). On average, the students in our treatment group had higher previous educational achievement and parental background than the average vocational student, and foreign students are totally absent from the analysis.

Thus, our results are valid only for this subset of VE students, and do not necessarily hold for recurrently underperforming students with a low education parental background, which arguably constitute an important target group of the new vocational education policy in Portugal.

In what follows we provide a general description of the policy reform under analysis. We then discuss the data and methods used to estimate its impacts on students' performance. And finally, present the main results of the study.

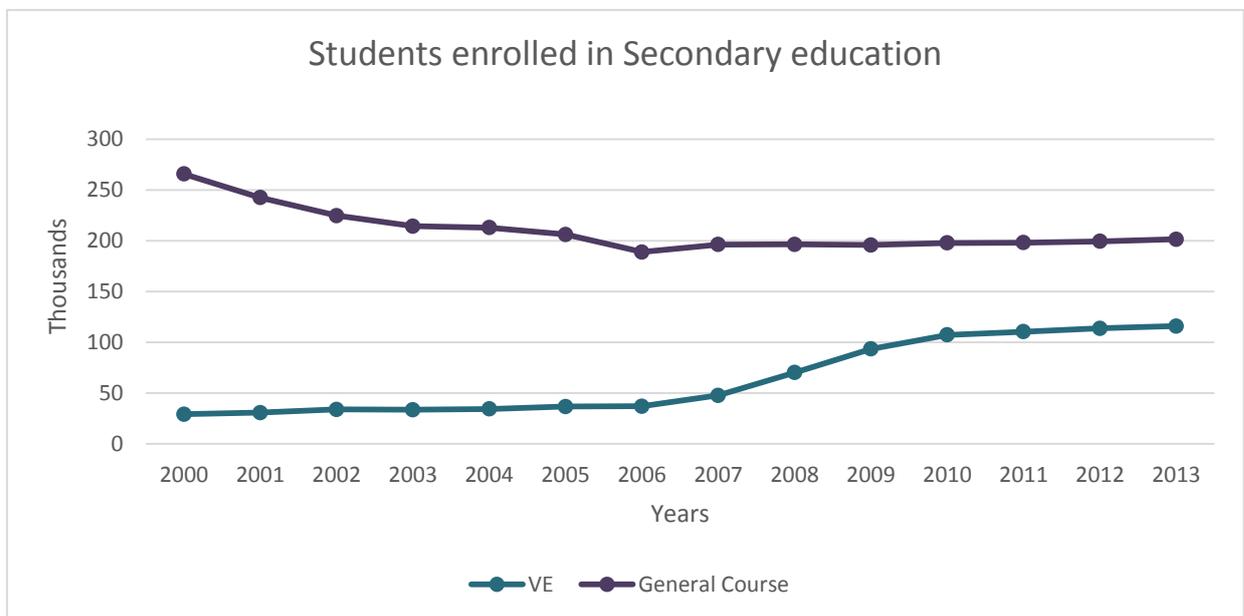
## **2. Description of the policy reform under analysis**

Vocational Education (VE) constitutes an alternative to Scientific-Humanistic Education (SHE) programmes. The latter have historically been the dominant type of education at the upper-secondary level in Portugal. SHE curricula includes general academic subjects mainly oriented to prepare students for higher education. In contrast, VE curricula include: a strong practical component, a set of general subjects<sup>1</sup>, and a short workplace learning component (similar to an apprenticeship) in local companies. Graduation from a VE programme provides students with a double certificate, including both the upper-secondary school diploma and a certificate of initial technical skills.

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<sup>1</sup> Including Portuguese, Physical Education, Philosophy, and some foreign language.

VE exists in the Portuguese education system since 1989. Initially, VE was confined to sector-specific Professional Schools, both public and private, which focused exclusively on this type of curricula<sup>2</sup>. After 2004, VE was introduced in “regular” public high-schools<sup>3</sup>, leading to a substantial increase in the number of students enrolled in this type of programmes – from 9% of total upper-secondary school students in 2004, to 29% in 2013.



Source: PORDATA

Source of data: DGEEC/Ministry of Education and Science – School Census

The growth of VE students in public schools did not lead to a decrease in the number of students in the private schools or a reduction in the number of individuals enrolled in scientific-humanistic courses in public schools. This is largely explained by the fact that, during the same period, compulsory education in Portugal was increased from nine to twelve years of schooling. The expansion of VE was, in fact, instrumental to accommodate the expected increase in the total number of upper-secondary students, accruing from the extension of compulsory education.

<sup>2</sup> Decreto-Lei N.º 26/89 de 21 de Janeiro

<sup>3</sup> Decreto-Lei N.º 74/2004 de 26 de Março

At present, the goals of VE in Portugal are: (i) to reduce early-school leaving, (ii) to improve the match between skills' supply and demand, and (iii) to expand the possible choices of programmes in high-schools, in order to meet different profiles and interests of students. VE main priority is to facilitate individuals' entrance to the labour market, although students are allowed to proceed to higher education (for this purpose, they have to perform national exams related to subjects that are not included in VE curricula).

During the period under analysis, VE in Portugal was co-financed by the ESF under three different Operational Programs of the Portuguese NSRF 2007-2013: OP Potencial Humano (POPH, in the mainland), OP Rumos (Autonomous Region of Madeira), and OP Pro-Emprego (Autonomous Region of Açores). Our study focuses on the interventions funded by POPH in mainland Portugal. This represents over 97% of the total number of VE students in Portugal and over 93% of ESF allocated to VE in 2007-2013 (1.7 B€).

### **3. Data**

#### **3.1. Data collection arrangements**

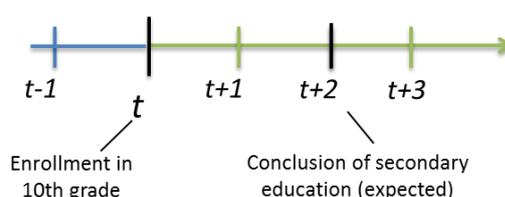
The counterfactual impact evaluation of VE in Portugal required data related to three sets of variables: (i) the type of education students are enrolled in (vocation versus scientific-humanistic); (ii) indicators of students' academic and labour market performance (transition, conclusion, dropout, access to higher education, and transition to employment); and (iii) the factors that determine school and labour market performance. The latter include variables related to students' demographic characteristics (sex, age, special education needs, etc.), family background (economic condition, guardians' academic background, etc.), past school performance (previous retention episodes, type of education in previous years), and the school context (proportion of foreign students, endowment of human resources, number of teachers per class, etc.).

The data regarding students' characteristics, family background, the school context and individuals' school trajectory were drawn from different administrative datasets managed by

the statistical bureau of the Ministry of Education and Science. All of which are based on information collected directly from schools and higher education institutions. Those datasets had never been crossed for the purpose of longitudinal analysis, requiring a significant effort by the agency's technical staff in collecting and organizing the data. The data related with the trajectory of students in the labour market was obtained from the Information Department of the Ministry of Labour and Social Affairs.

On the basis of a unique code created specifically for this purpose, we were able to cross the databases from the two agencies mentioned above, while complying with statistical secrecy rules. Only the agencies – not the researchers – had access to the correspondence table allowing to match the project specific code with other individual information (e.g., social security number). Each public agency provided their specific datasets to the researchers (assuring the anonymity of the data) and none of them had access to the merged database.

The available data allowed us to analyse three cohorts, corresponding to the academic years of 2008/2009, 2009/2010 and 2010/2011. Each cohort has students enrolled in the first year of upper secondary school (10th grade). We were able to trace each individual's trajectory between the previous year ( $t-1$ ) and the following three years ( $t+3$ ). This allowed us to analyse the impacts of vocational courses on the individuals' academic and labour market performance.



### 3.2. Scope of analysis

The scope of analysis is determined by three main factors: the focus on the effects of the 2004 reform; the availability of data; and the existence of a proper counterfactual. Therefore, only part of the students enrolled in high school (in both VE and SHE) are considered in the study.

Our focus on the effects of the 2004 reform, which was directed to general public schools, led us to exclude from the analysis students enrolled in VE in private schools or special schools within the public system (e.g., professional schools under the tutelage of sectorial ministries, corresponding to 38,5% of total VE students). As such, this study does not evaluate the whole VE system in Portugal, focusing instead on VE in regular public schools.

Moreover, the lack of (reliable) data led us to exclude from the analysis all foreign students and students with special educational needs.

Finally, the absence of a proper counterfactual data led us to ignore the following situations:

- students already enrolled in VE before high school (these students present higher risks of dropout at an early stage and are seldom enrolled in scientific-humanistic programs if they reach high school; they correspond to 21,9% of the total universe of VE students);
- underperforming students already enrolled in high school VE (VE students that fail to proceed to the next grade rarely switch to scientific-humanistic programs, so there are few comparable cases in the latter type of programmes; these represent 6,1% of the total universe of VE students); and
- students over 18 years old (who are rarely enrolled in scientific-humanistic programs, if they reach high school; they correspond to 5,9% of the total universe of VE students).

Therefore, our analysis focuses on the impacts of VE in school and labour market performance on students who:

- have Portuguese nationality;
- have no special educational needs;
- are between 15 and 18 years old;
- attend general public schools;
- were enrolled in a lower-secondary scientific-humanistic programme in the previous year.

Individuals with these characteristics represent about 26% of total VE students and 68% of total SHE students (see Table 1, below).

**Table 1 – Distribution of students by type of programme  
(for the three cohorts under analysis)**

	Total data (1)		Target group (2)		(2)/(1)
	N.	%	N.	%	in %
Vocational education (VE)	125.154	38%	31.940	19%	26%
Scientific-humanistic (SH)	204.616	62%	139.268	81%	68%
<b>Total</b>	<b>329.770</b>	<b>100%</b>	<b>171.208</b>	<b>100%</b>	<b>52%</b>

Source: Own elaboration. Data from DGEEC - Ministry of Education and Science

### 3.3. Preparing the data

In the following, we describe the several steps involved in the preparation of the data for the analysis.

The preliminary stage in preparing the data consisted in identifying missing values and attempting to correct them (e.g., using information from t-1 to fill variables in t, whenever sensible and possible).

The next step consisted in the construction of the control and outcome variables. An initial selection was based on all the available data, and included variables related with: students' sex, age, nationality, and special educational needs; guardian's nationality, academic qualifications, and employment situation; the use of computer and internet at home; school social support benefits; and school context variables.

Regarding the outcome variables related with academic performance during high-school, we started to consider the following: transition in t, transition in t and t+1, transition in t or t+1,

conclusion in t+2, conclusion in t+2 or t+3, dropout in t, dropout in t+1, dropout in t+2, enrolled in higher education in t+3, t+4 or t+5.

All variables were then subjected to consistency tests. Overall, we used 17 consistency criteria for control variables and 8 for outcome variables (see list of consistency criteria in Annex A). After excluding observations with missing and/or inconsistent values, we retained 77% of VE students and 79% of SHE students pertaining to the three cohorts under analysis (Table 2).

**Table 2 – Distribution of students by type of programme  
(for the three cohorts under analysis)**

	Target group (1)		Observations with valid data (2)		(2)/(1)
	N.	%	N.	%	in %
Vocational education (VE)	31.940	18,7%	24.664	18,3%	77,2%
Scientific-humanistic (SHE)	139.268	81,3%	110.231	81,7%	79,2%
<b>Total</b>	<b>171.208</b>	<b>100%</b>	<b>134.895</b>	<b>100%</b>	<b>78,8%</b>

Note: the number of observations with valid data may change slightly according to the outcome variable under analysis. The values in the table refer to the variable “High school graduation at t+2”

Source: Own elaboration. Data from DGEEC - Ministry of Education and Science

The table in Annex B shows that the distribution of students' characteristics between the group of observations for which the data is valid and the original target group is very similar. Therefore, we do not expect significant biases in the results accruing from the exclusion of observations with missing and/or inconsistent values.

After performing all the aforementioned quality checks, we decided to use the following **control variables**:

- Sex
- Age (in  $t-1$ )
- Student nationality
- Guardian's educational level (in  $t-1$ )
- School social support (in  $t-1$ )
- Type of education (in  $t-1$ )
- Having computer at home (in  $t$ )
- School's average number of students per non-teaching staff member (in  $t-1$ )
- School's percentage of students with scholar social support (in  $t-1$ )
- Grade of national exam of Portuguese (in  $t-1$ )
- Grade of national exam of Mathematics (in  $t-1$ )

As **outcome variables regarding academic performance** we use the following:

- Grade transition at  $t$
- Grade transition at  $t$  and  $t+1$
- Conclusion of secondary education at the end of  $t+2$
- Dropout at  $t$  or  $t+1$
- Enrolment in higher education after  $t+2$

Finally, the **outcome variables related with labour market performance** are:

- Employed between  $t+3$  and  $t+4$ <sup>4</sup>
- Number of months in employment between  $t+3$

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<sup>4</sup> We considered student to be employed between  $t+3$  and  $t+4$  if she/he received at least one monthly remuneration within this period

- Average number of days worked per month during  $t+3$
- Average daily remuneration during  $t+3$

#### 4. CIE method(s) used

To assess the impacts we used a Coarsened Exact Matching approach, by which the performance of students enrolled in vocational education is compared with the performance of other individuals who are strictly identical according to the variables used in the analysis, except for the fact that they enrolled in the scientific-humanistic courses<sup>5</sup>.

Essentially, the method is based on three steps. The first step is the matching procedure, where we aggregate data into strata of individuals who are identical according to all control variables used in the analysis (which are expected to influence the performance of students), and keep only strata with at least one VE and one SHE. Secondly, within each homogeneous group, we compute the average performance (e.g., percentage of graduates) separately for students enrolled in vocational courses and for students in scientific-humanistic programmes; and the difference in the average outcomes between these two subgroups – these differences correspond to the impacts of vocational education for each homogenous group of students. In the final step, the overall impact of vocational courses is computed as the weighted average of those differences (i.e., as the weighted average of the impacts for each strata), with weights given by the proportion of vocational education students in each homogeneous group.

This matching method revealed to be highly adequate in the context of this project. Besides its technical advantages with regard to other matching approaches (see, e.g., Iacus et al., 2012)<sup>6</sup>, its simple logic proved to be rather intuitive and easily grasped by the project partners who lack advanced training in statistics and econometrics.

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<sup>5</sup> Thus, students enrolled in the scientific-humanistic courses constitute the counterfactual. In other words, we are assuming that the alternative for a student who enrolls in vocational education at the upper secondary school level would be to enroll in the 'regular' scientific-humanistic education.

<sup>6</sup> Note, in particular, that this method ensures that the balancing property is satisfied and additional tests are not required.

As shown in Table 3, the matching procedure, which excludes unmatched individuals, retained for further analysis nearly  $\frac{3}{4}$  of VE students and less than  $\frac{1}{2}$  of SH students, suggesting that the diversity of individual profiles is greater in the latter case. In other words, more than 55% of students in scientific-humanistic courses have no comparable individual in the VE group.

**Table 3 – Distribution of type of programme before and after matching**

	Before matching (valid data)		After matching		(2)/(1)
	N.	%	N.	%	in %
Vocational education (VE)	24.664	18,3%	18.558	27,6%	75,2%
Scientific-humanistic (SH)	110.231	81,7%	48.564	72,4%	44,1%
<b>Total</b>	<b>134.895</b>	<b>100%</b>	<b>67.122</b>	<b>100%</b>	<b>49,8%</b>

Note: the number of observations with valid data may change slightly according to the outcome variable under analysis. The values in the table refer to the variable “High school graduation at t+2”

Source: Own elaboration. Data from DGEEC - Ministry of Education and Science

Table 4 provides more detailed information regarding the distribution of characteristics of VE and SHE students before and after matching. For VE students, the matching procedure does not change significantly the distribution of characteristics, except for the variables related with age. In fact, since  $\frac{1}{6}$  of SHE are above 15 years old, and the corresponding proportion for VE students is more than 50%, it is harder to find an exact match for this age groups. Therefore, VE students over 15 years old are somewhat underrepresented in the common support used in the analysis (their proportion decreases from 51% to 42% after matching).

This table also helps to clarify the main differences between VE and SH students. VE students tend to be older, have a more modest academic performance in lower-secondary education exams, and their guardians have lower academic qualifications.

**Table 4 – Distribution of type of programme before and after matching by control variables**

	Before matching		After matching	
	SHE	VE	SHE	VE
<b>Individual characteristics</b>				
Percentage of female	56,7%	45,5%	53,3%	47,1%
Percentage of 15 years old	83,3%	49%	81,1%	58,1%
Percentage of 16 years old	12,5%	32,4%	15,1%	31,7%
Percentage of older students	4,2%	18,6%	3,8%	10,2%
Percentage with Math results at t-1 <50%	33,6%	69,7%	50,9%	71,3%
Percentage with Math results at t-1 >75%	29%	3,9%	8,7%	3,3%
Percentage with Portuguese results at t-1 <50%	21,2%	53,1%	29,2%	51%
Percentage with Portuguese results at t-1 >75%	21,9%	2,5%	4,2%	2%
<b>Family background</b>				
Percentage of students having computer at home	66,3%	58,4%	68,1%	60,9%
Percentage of guardians with less than secondary schooling	55,6%	82,1%	70,1%	84,4%
Percentage of guardians with higher education	20,2%	3,5%	29,3%	2,8%
Percentage of students with social support – level A	14,2%	28%	15,4%	25,8%
Percentage of students with social support – level B/C	13,5%	19,5%	12,8%	17,6%

## 5. Findings and lessons learnt

### 5.1. Main results

In respect to students' academic performance, we conclude that vocational education has positive impacts in grade transition and high-school graduation; small and negative impacts in dropout rates; and negative impacts on the access to higher education. Table 5 presents the estimated impacts, which are all statistically significant.

**Table 5 – The impacts of VE on academic performance  
(main model)**

	SH	VE	Impact
Transition in t (to the 11 <sup>th</sup> grade)	64,1%	87,6%	23,5
Transition in t and t+1 (to the 12 <sup>th</sup> grade)	51,5%	82,7%	31,1
High school graduation at t+2	29,1%	65,3%	36,3
Dropout at t or t+1	7,9%	6,7%	-1,2
Enrolment in higher education after t+2	27,5%	15,6%	-11,9

Note: all the estimated impacts are statistically significant  
Source: Own elaboration

More specifically, regarding the grade transition during high-school, we found that vocational education increases by 24 percentage points (p.p.) the probability of transition from the 10<sup>th</sup> to the 11<sup>th</sup> grades in the current academic year and by 31 p.p. the probability of transition from the 10<sup>th</sup> to the 12<sup>th</sup> grade within two years.<sup>7</sup>

In what concerns enrolment in higher education after  $t+2$ , we estimate that vocational education decreases the probability of participation in post-secondary studies by 12 p.p.. Finally, the estimated impact of the program on dropout rates in the first two years of high school was negligible.

<sup>7</sup> Recall that this applies only to the VE students consider in our study, that is: Portuguese students in regular public schools, under 18 years old, and who were not previously enrolled in VE programmes.

These results confirm the idea that the expansion of vocational education has given a positive contribution to the recent improvement in youth education attainment in Portugal. The fact that the probability of dropout in the first two years does not decrease significantly when a student enrolls in vocational course (instead of a 'regular' program) is largely explained by the fact that dropout rates tend to be rather low during this initial period in any case (below 10% in both types of education). On the contrary, our results reveal that vocational courses are indeed helping to increase the proportion of young people of graduates from high school.

The normative interpretation of the estimated (negative) impact of vocational courses on proceeding to post-secondary education is less clear. On one hand, this result is not especially surprising, if we consider that vocational education aims to facilitate the transition from school to work. However, our results suggest that similar students who follow different educational paths will more easily be excluded from higher education if they enrol in vocational education. Taking into account that the higher education system in Portugal includes not only universities but also polytechnic institutions (offering more professional-oriented programs, suited to students with a vocational education and training background), and that the higher education wage premium is still considerably high in the Portuguese economy, our results may be signalling the existence of a too strong bias in vocational programmes against proceeding to higher education.

Regarding the labour market performance we found that, in general, vocational education has positive and statistically significant impacts on the probability of being employed after high school graduation and moderate, statistically significant impacts in labour market quality variables (see Table 6, below).

**Table 6 – The impacts of VE on labour market performance  
(main model)**

	<b>SH</b>	<b>VE</b>	<b>Impact</b>
Percentage of individuals in employment at least for one months during year t+3 <sup>(a)</sup>	28,1%	52,6%	24,5
Average number of months worked <sup>(b)</sup>	6	6,9	1
Average number of days worked per month <sup>(b)</sup>	24	25,7	1,6
Average daily remuneration (in euros) <sup>(b)</sup>	18,9	19,8	1

<sup>(a)</sup> The estimated impact corresponds to students who graduated at t+2 and did not pursue higher-education

<sup>(b)</sup> The estimated impact corresponds to students who were employed at least once during t+3

Note: all the estimated impacts are statistically significant

Source: Own elaboration

For students who graduated from high-school and did not proceed to higher education, we estimate that vocational education increases the probability of being employed in the next 12 months by 25 percentage points. The impact of vocational education in the average daily remuneration is nearly one euro (corresponding to 30 euros in the monthly remuneration or an annual impact of 360 euros). The impact on the average number of days worked per month is 1,6 (or an annual impact of 19 days) and, finally, the number of months worked after graduation is, on average, one month higher for VE students.

These results suggest that individuals who graduate from VE programmes and do not proceed to higher education not only have a higher probability of being employed after graduation (as compared to individuals in similar circumstances who graduated from SHE programmes), but the jobs they find are also of slightly higher quality. In this sense, and considering VE's focus on employability, we can conclude that the new education policy is accomplishing its initial goals. One should keep in mind the restricted focus of the present analysis. As shown above, individuals who participate in vocational education programs are on average very different to those who enrol in scientific-humanistic one. However, any kind of matching procedure needs to match individuals in the group of vocational with individuals in scientific-humanistic tracks on their background characteristics. In this analysis, this could only be achieved by focusing on

individuals in the treatment group who had on average higher achievement and parental background than the average vocational student. Similarly, the control group of scientific humanistic students used has significant lower achievement and parental background than the average student in this group. As a consequence, the control and treatment groups used are not representative for the average vocational student. This decreases the external validity of the results and possible policy conclusions that can be drawn. Results of the analysis show that the vocational program was beneficially in terms of increased school progression, which holds only for above average educated VE students. Arguably, these students were not the main focus of the policy. For pupils with lower academic achievement and social background no conclusions can be drawn on the basis of this study.

## 5.2. Sensitivity analysis

For the purpose of sensitivity analysis, we re-estimated the impacts of VE on students' academic and labour market performances applying a Propensity Score Matching approach; and a CEM approach using an alternative coarsening procedure.

In the Propensity Score Matching we used the same control and outcome variables as in the CEM method<sup>8</sup>. We used Radius Matching, in which each propensity score of a treated observation is matched with a control unit whose propensity score is inside a pre-defined radius (Becker & Ichino, 2002). The estimated impacts did not change substantially (as compared to those obtained with the main model), with the exception of the variable related with high-school graduation (see Table 7 below and Annex C).

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<sup>8</sup> Due to multicollinearity issues, the variables type of program in basic education, special educational needs and student's nationality were omitted. The variable average number of students per employee was omitted due to statistically non-significance

**Table 7 – The impacts of VE on academic and labour market performance  
(sensitivity analysis – Propensity Score Matching)**

	SH	VE	Impact
Transition in t (to the 11 <sup>th</sup> grade)	62,1%	86,3%	24,3
Transition in t and t+1 (to the 12 <sup>th</sup> grade)	49,3%	80,9%	31,8
High school graduation at t+2	37,3%	64,1%	35,3
Dropout at t or t+1	10,1%	7,3%	-2,8
Enrolment in higher education after t+2	27,3%	14,8%	-11,7
Employment at least once during t+3 <sup>(a)</sup>	22,6%	44,3%	21,7
Average number of worked months <sup>(b)</sup>	6,2	7,1	0,9
Average number of worked days per month <sup>(b)</sup>	24,3	25,9	1,5
Average daily remuneration <sup>(b)</sup>	19,1	19,9	0,7

<sup>(a)</sup> The estimated impact corresponds to students who graduated at t+2 and did not pursue higher-education

<sup>(b)</sup> The estimated impact corresponds to students who were employed at least once during t+3

Note: all the estimated impacts are statistically significant

Source: Own elaboration

We also estimated the same impacts with another CEM approach, this time using an alternative coarsening of control variables. More specifically, we aggregated some categories of variables with few observations – which often led to the exclusion of unmatched observations – as follows:

- We transformed the categorical variable “scholar social support” (with four original categories, A, B, C, and no support) into a dichotomous variable indicating the presence/absence of support.
- We simplified the variable “guardians’ level of academic qualifications” by merging categories of low education level (until six year of schooling) and of high education level (higher education degree or more).

- We transformed the continuous variable “average number of students per non-teaching staff member” into a dichotomous variable, indicating if the school had until 30 students per employee or more.

The change in the coarsening procedure allowed us to increase the number of valid observations and the number of homogenous groups. The impacts, as expected, did not change substantially (see Table 8, below).

**Table 8 – The impacts of VE on academic and labour market performance  
(sensitivity analysis – alternative coarsening)**

	SH	VE	Impact
Transition in t (to the 11 <sup>th</sup> grade)	62,7%	87%	24,3
Transition in t and t+1 (to the 12 <sup>th</sup> grade)	50,1%	82%	31,8
High school graduation at t+2	28,1%	64%	35,9
Dropout at t or t+1	9%	6,8%	-2,2
Enrolment in higher education after t+2	26,6%	15%	-11,6
Employment at least once during t+3 <sup>(a)</sup>	27,9%	52,2%	24,4
Average number of worked months <sup>(b)</sup>	6	6,8	0,8
Average number of worked days per month <sup>(b)</sup>	24	25,6	1,6
Average daily remuneration <sup>(b)</sup>	19	19,9	0,8

<sup>(a)</sup> The estimated impact corresponds to students who graduated at t+2 and did not pursue higher-education

<sup>(b)</sup> The estimated impact corresponds to students who were employed at least once during t+3

Note: all the estimated impacts are statistically significant

Source: Own elaboration

## References:

- Becker, S. O., & Ichino, A. (2002). Estimation of average treatment effects based on propensity scores. *The Stata Journal*, 2 (4), 358–377.
- Iacus, S.; King, G., & Porro, G. (2012). Causal Inference without Balance Checking: Coarsened Exact Matching. *Political Analysis*, 20 (1), 1-24.

## Annex A – List of inconsistencies

Variables	Inconsistency criteria
<b>Control variables</b>	
Sex	Sex cannot change between t-1 and t
Age	Student age cannot be lower than 14 years at 10 <sup>th</sup> grade
Students' nationality	Students' nationality cannot change between t-1 and t
Guardians' nationality	Guardians' nationality cannot change between t-1 and t
Guardians' academic background	Guardians' academic background cannot decrease between t-1 and t
Who is the guardian	If student is the Guardian he cannot have qualifications superior to the 10 <sup>th</sup> grade
Basic education	If student was enrolled in basic education in t-1, then the curricular year must have been the 9 <sup>th</sup> grade
Basic education	If student was enrolled in basic education in t-1, then the number of enrolments in t must be one
Curricular year	If student was enrolled in the 10 <sup>th</sup> grade at t, then in t+1 cannot be enrolled in a lower curricular year
Curricular year	If student was enrolled in the 10 <sup>th</sup> grade at t+1, then in t+2 cannot be enrolled in a lower curricular year
Conclusion at t+2	If student completed secondary education in t+2, then in t+1 he must have been in the 11 <sup>th</sup> grade
Conclusion at t+2	If student completed secondary education in t+2, then in that year he must have been enrolled in the 12 <sup>th</sup> grade
Conclusion at t+2	If student completed secondary education in t+2, then he cannot be enrolled in t+3
Conclusion at t+3	If student completed secondary education in t+3, then in t+2 he must have been enrolled in the 12 <sup>th</sup> grade
Conclusion at t+3	If student completed secondary education in t+3, then he must have been enrolled in the same course in t+2 and t+3
Computer	If student had computer at home in t-1 then, he must have in t
Internet	If student had internet at home in t-1, then he must have in t
<b>Outcome variables</b>	
Higher education	If student was enrolled in higher education in t+5, then he must have been enrolled in the 12 <sup>th</sup> grade in t+2 or t+3
Higher education	If student was enrolled in higher education in t+3, then he must have been enrolled in the 12 <sup>th</sup> grade in t+2

Higher education	If student was enrolled in higher education in t+3, then he must have been enrolled in the 11 <sup>th</sup> grade in t+1
Higher education	If student was enrolled in the 10 <sup>th</sup> grade in t, then he cannot be enrolled in higher education in t+4 or t+5
Higher education	If student was enrolled in higher education in t+3, then he cannot be enrolled in secondary education in that year
Higher education	If student was enrolled in the 10 <sup>th</sup> grade in t, then he cannot be enrolled in higher education in t+2
Higher education	If student was enrolled in higher education in t+4, then he must have been enrolled in the 12 <sup>th</sup> grade in t+2 or t+3
Higher education	If student was enrolled in higher education in t+4, then he must have been enrolled in the 11 <sup>th</sup> grade in t+1 or t+2

## Annex B – Comparing the distribution of students’ characteristics in the

### General statistics

	Universe of analysis		Observations with valid data	
	SHE	VE	SHE	VE
High school graduation at t+2	55,6%	61,7%	56,2%	62,6%
At least one retention between t and t+2	39,5%	26,1%	39,0%	25,5%
Dropout at t ou t+1	3,6%	8,4%	3,5%	8,2%
N.a.	1,4%	3,8%	1,3%	3,7%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

### Statistics on high school performance

	Universe of analysis		Observations with valid data	
	SHE	VE	SHE	VE
High school graduation at t+2	55,6%	61,7%	56,2%	62,6%
At least one retention between t and t+2	39,5%	26,1%	39,0%	25,5%
Dropout at t ou t+1	3,6%	8,4%	3,5%	8,2%
N.a.	1,4%	3,8%	1,3%	3,7%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

### Statistics on post-secondary performance

	Universe of analysis		Observations with valid data	
	SHE	VE	SHE	VE
Enrollment in higher education after t+2 <sup>(1)</sup>	78,6%	20,3%	79,0%	20,3%
Employed at least once during t+3 <sup>(2)</sup>	25,4%	51,7%	25,6%	52,0%
Average number of work days per month <sup>(3)</sup>	23,4	25,8	23,4	25,8
Average number of months in employment during t+3 <sup>(3)</sup>	5,63	7,04	5,61	7,07

### Statistics on some individual characteristics and performance

	Universe of analysis		Observations with valid data	
	SHE	VE	SHE	VE
% of female	56,3%	45,0%	56,7%	45,5%
% of 15 years old	82,5%	46,1%	83,3%	49%
% of 16 years old	13%	32,6%	12,5%	32,4%
% with Math results at t-1 <50% in	33,4%	65,3%	33,6%	69,7%
% with Math results at t-1 > 75%	28,2%	3,6%	29%	3,9%
% with Portuguese results at t-1 <50%	21%	49,4%	21,1%	53,1%
% with Portuguese results at t-1 > 75%	21,3%	2,3%	21,9%	2,5%

### Statistics on family background

	Universe of analysis		Observations with valid data	
	SHE	VE	SHE	VE
% having computer at home	64,6%	57%	66,3%	58,4%
% of guardians with less than secondary schooling	52,2%	76,9%	55,6%	82,1%
% of guardians with higher education	18,6%	3,2%	20,2%	3,5%
% of students with social support - level A	14,2%	27,8%	14,2%	28%
% of students with social support - level B/C	13%	19,1%	13,5%	19,5%

## Annex C – Comparison of methods in assessment of impacts

The impacts of VE on academic and labour market performance  
(main model and sensitivity analysis - comparison)

	<b>CEM</b>	<b>CEM</b> (alternative coarsening)	<b>PSM</b>
Transition in t (to the 11 <sup>th</sup> grade)	23,5	24,3	24,3
Transition in t and t+1 (to the 12 <sup>th</sup> grade)	31,1	31,8	31,8
High school graduation at t+2	36,3	35,9	35,3
Dropout at t or t+1	-1,2	-2,2	-2,8
Enrolment in higher education after t+2	-11,9	-11,6	-11,7
Employment at least once during t+3 <sup>(a)</sup>	24,5	24,4	21,7
Average number of worked months <sup>(b)</sup>	1	0,8	0,9
Average number of worked days per month <sup>(b)</sup>	1,6	1,6	1,5
Average daily remuneration <sup>(b)</sup>	1	0,8	0,7

<sup>(a)</sup> The estimated impact corresponds to students who graduated at t+2 and did not pursue higher-education

<sup>(b)</sup> The estimated impact corresponds to students who were employed at least once during t+3

Source: Own elaboration

## **II Counterfactual Impact Evaluation of Traineeships Programme**

## 1. Introduction

Traineeships are one of the four employment programs targeted at the unemployed in Portugal over the 2000s, the other three being hiring incentives, incentives to entrepreneurship and self-employment, and subsidized occupation in the public and not-for-profit sectors.

The Traineeship programme was first created in 1997 and is still active. It aimed to facilitate youngsters' transition from the educational / vocational training system into the labor market by increasing the human capital of participants through on-the-job training in the private or public sectors. The intervention was motivated by the belief that youth unemployment is linked to some mismatch between the skills demanded in the labor market and those provided by the education system. It therefore subsidised on-the-job training with the goal of equipping participants with skills in high demand and facilitate their transitions into regular jobs. The programme also aims to raise employers' awareness of the new qualifications offered by the educational/vocational training systems, thereby increasing the demand for them.

The distinctive characteristic of traineeships rests on the fact that it offers on-the-job training to young qualified unemployed. This makes it different from other training programs targeted at low-education workers, with or without labor market experience. As compared to other employment programs within the Portuguese active employment policies, traineeships stand out for being the only program with a maximum age eligibility condition. Individuals eligible for participation in traineeship programs are also eligible for all the other employment and training programs.

In this report we evaluate empirically the impact of the Portuguese traineeship program on the re-employment probabilities of participants. We focus on treatment episodes taking place during the 2007-2013 period and look at employment outcomes up to 3 years after the start of treatment. To do so we resort to rich longitudinal information constructed from the match of three administrative datasets: two datasets from the Employment and Vocational Training Institute (IEFP), describing all spells of registered unemployment and participation in active labor market programs, and one dataset from the Social Security (SS), describing employment

spells. Put together, the three sources allow us to construct the employment, registered unemployment and treatment histories of all individuals, and use this information to complement other demographic information in constructing the counterfactual for individuals taking traineeships.

In empirical studies, traineeships are often grouped together with other training programs. This limits the amount of direct and clear-cut evidence on the effects of programs similar to the one we are considering (e.g., this is the case of the studies by Card *et al.*, 2010, and Card *et al.*, 2015).

Three notable exceptions deserved mention. Lechner and Wunsch (2009) focuses in training programs in Germany but disaggregates the analysis into five different types. The authors find that six months after the participation decision the unemployment probability decreases by 25 percentage points and the employment probability increases by 15 percentage points. In the long run (three years or more) the employment probability increases for participants about 10 percentage points. Similar results are reported also by Fitzenberger and Speckesser (2005) in which case the estimated effect approaches 20 percentage point in the long-run (36 months after or more). Hamalainen and Ollikainen (2004) find significant lock-in effects during the early months of program participation and then a 6-8 p.p. increase in the probability of employment for the treated.

For Portugal, Nunes (2007) compares the employment effects of alternative active labour market programmes and finds that traineeships are the most effective. Two other studies, although focusing on different topics, also deserve mention. Saraiva (2007) and Almeida and Carneiro (2009), using different data and methodology, find that employer-provided training (a close relative of traineeships) is the most effective type of training from the viewpoint of employment probability.

The rest of this report is organized as follows. Section 2 describes the traineeship program, its eligibility rules and how these change over time. Section 3 describes the data and the issues that we faced in merging information from the different sources. Section 4 describes the data. Here we focus on the entire set of individuals who participate in a traineeship at some point between 2004 (when data is first available from the IEFP) and 2013. Section 5 describes the

estimation method, the selection of data for causal analysis and discusses the empirical estimate. To avoid data selection issues, we choose to focus on individuals observed in employment some time before registering for a new unemployment spell. Moreover, we study only registration and treatment spells happening between January 2007 and December 2012, hence ensuring the availability of information for at least 2 years prior and 1 year after registration for all spells. Finally section 7 concludes.

## 2. The Institutional Setting

Traineeships are part of a set of treatments designed to help unemployed individuals to move back into work. The program was first created in 1997 and is still active. Although it is running for a period of 18 years, the program retains its main original features both in terms of its aims, target population and scope. The most significant changes made through the years refer to the eligibility criteria, maximum duration and total amount of the grant. These are described below, together with the main features of the program.

Traineeships are preferably targeted at qualified young unemployed. The age cutoff was initially set at 30, so that only those aged below 30 were eligible to traineeships. This age limit was relaxed to 35 over some of the financial crisis years, between 2009 to 2011, but was later reduced back to 30. The education eligibility rule also changed over time. The program was first targeted at those with compulsory or some post-compulsory education but who have not graduated from college; in 2009 the rules changed as the program changed focus to more educated individuals, demanding that participants had at least completed high-school education or equivalent (12 years of schooling); the education eligibility rule was further tightened in 2011 to require some post high school education. But during 2013, with the increasing deterioration of economic conditions, access to traineeships was relaxed to reach all with at least compulsory education.<sup>9</sup> However, both the age and education requirements can

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<sup>9</sup> Qualification levels are classified according to the Portuguese Dictionary of Qualifications. In 2009 it is structured into eight levels, from the level corresponding to six years of education (level 1) to the doctorate level (level 8). The other levels correspond to 9 years of schooling (level 2), 12 years of schooling (levels 3 and 4 depending on whether in the formal schooling systems or in dual education, respectively), post-secondary education (level 5), bachelor degree (level 6), master degree (level 7), and doctorate degree (level 8). The correspondence with the ISCED classification is straightforward at the bottom and top education levels, but less obvious for mid-level positions.

be dispensed with when applicants have recently acquired additional schooling or training that qualifies them for new types of jobs. Given the small number of participants in this category, they will not be considered in the present evaluation exercise.

The program specifically targets first-time job seekers, although it is also open to other young unemployed who failed to find a suitable occupation. Only those registered as unemployed in one of the Public Employment Offices are entitled to participate. Its coverage is universal in the sense that there are no exclusion rules specified on the basis of location. However traineeships opportunities may vary across regions, depending on the specificities of the local labor markets and industry structure.

Traineeships subsidise work in the private or public sector for trainees receiving on-the-job training for a limited period. The duration of the subsidy was initially limited to 12 months but later reduced to 9 months in 2010. The trainee is paid a fixed monthly grant that depends only on his/her education and is indexed to the Social Support Index (Indexante de Apoios Sociais - IAS).<sup>10</sup> The grant is covered in parts by the subsidy and the employer, the parts depending on the legal form of the employer (public/private, for-profit/not-for-profit organisation) and its size.

The value of the grant increases with the qualifications of the trainee. In 2015 the grant is bounded between 1 (for skill level 2 or less) and 1.65 of the IAS (for skill level 6 or higher). The factor applying to the IAS used to compute the value of the grant was reduced first in 2010 (by 0.3 to 0.4 to all skill levels) from its 2009 levels equal to 1.5 (for skill level 3) and 2 IAS (for skill level 5). The current minimum value of the factor set to 1.0 was introduced due to the extension of the program to skill level 2. When it was first introduced in 2007, the IAS was set at 397.6 Euros. Subsequently, it was increased by 2.4% in 2008 and 2.8% in 2009, in nominal terms. Since 2009 and until 2015, the value of the IAS remains constant at the level set in 2009, *i.e.*, 419.22 Euros.

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<sup>10</sup> Until 2009 the value of the grant could be higher in the case of jobs marked by substantial gender discrimination and in case of disabled workers. Between 2009 and 2011 majoration was possible only in the case of disabled workers. Since 2011, no majoration exists.

The program subsidizes a proportion of the grant that varied between 0.20 and 0.67 in 2002. Since then the proportion covered by the grant has increased, and is now typically 0.80 although it can reach 0.95 in some worker-specific circumstances (all related to belonging to at-risk groups of being disabled).

All trainees also receive a daily allowance for meals and a workplace hazard insurance. Until 2009, trainees commuting for more than 50km between home and workplace were entitled to a bonus payment to compensate for travelling costs. This was then abolished. All insurance premiums and bonus are paid by the IEFP.

The location of trainee placements can be done by either the prospective trainees or the employment office. In the former case, unemployed individuals apply to trainee positions advertised directly by employers (traineeship organisers) and can then apply for the traineeship subsidy in case they are selected. Alternatively, the employment office is informed of trainee positions offered by local employers and selects participant(s) from the pool of eligible unemployed individuals.

In both cases, casework officers are expected to assess the employer organizing the traineeship, the traineeship plan, and the match between the traineeship and the potential participants. The assessment is supposed to consider the firm's capacity to effectively implement the traineeship plan (its size and workforce composition) and the prospects for subsequent hiring of the participant. To the best of our knowledge, there is no publicly available formal description of the selection process. Although administrative selection is not ruled out, we believe the process is essentially driven by self-selection.

### **3. Data**

The data for the empirical analysis results from the merging of three administrative databases containing longitudinal information on employment, registered unemployment and treatment events. The first two datasets are from the Employment and Vocational Training Institute (IEFP). The first details information on all registration spells with the Employment Office from January 2004 to December 2013; the second includes information on all treatment spells in employment programs offered by the IEFP over the same period. Since each individual has a

unique identifier in both datasets, his/her registration and treatment history can be constructed. The data also includes some demographic information on date of birth, gender, residence and education, as well as the identification of the entity hosting the traineeship or delivering other treatment in case of participants.

The third data source is provided by the Institute of Social Security (SS). SS data is available from January 2005 to December 2013 on all transfers received from (contributions) and paid to (benefits) the individuals that ever register with the IEFP over that observation window. Based on the nature of the transfers, we can reconstruct the employment history of all these individuals from January 2005 to December 2013 and identify, whenever they are out-of-work, whether they are in receipt of an unemployment subsidy, disability/sickness benefits or other type of support.

Unique identifiers for each individual make it possible to link the three data sources and to trace individuals throughout the observation window, recovering participation in all types of active labor market programs since 2004 as well as their labor market history from 2005 together with a detailed description of their personal characteristics and that of local labor market conditions. This holds true for as long as individuals maintain a relationship with the social security system or become unemployed and register for job-search with an Employment Office. In periods when no information is available, however, we cannot determine whether the individual is not actively participating in the labor market and not in receipt of any benefit, or whether we cease to observe him/her due to the lack of data coverage. The latter may happen in case of death, migration or when moving to a job in specific industries that have their own specific social security system. Jobs falling outside the social security domain could be a cause for concern in earlier years, when the Public Administration had its own separate social security system; in the years we analyze, however, new contracts in the Public Sector are also covered by the public social security system and will hence be observed in the SS data.

There is a total of 3,108,978 individuals in the IEFP registration data, of whom 988,798 participate in some for employment program over the observation window. The SS data contains information on 2,469,225 individuals, of whom we can successfully merge 2,383,537 with the IEFP database. This means that there are 85,688 individuals in the SS dataset for whom

we cannot find information in the IEF. We discard these observations as errors. In contrast, there is a large sample of 725,441 individuals who can be found in the IEF registration data but not in the SS dataset. These are mostly individuals observed in IEF before January 2005 and young individuals at the end of the observation window, who never move into employment or become entitled to benefits. Amongst the participants in ALMP, 146,031 participate in traineeships and 129,714 can be found in all three samples. In terms of demographic characteristics including gender, age, education and residence, the pre- and post-merge IEF samples of traineeships exhibit no notorious differences.

A number of corrections to the original data had to be implemented. Observations on individuals with conflicting information on such variables as gender and birth date in different data sets were deleted. In the SS database some modifications were made to retrieve the situation in the labor market of an individual on a monthly basis. First, the exact duplicates on the date, type, value of pay and number of days of remuneration were removed. Secondly, for the purpose of this study it is essential to keep a single observation per individual per month that unequivocally describes his or her situation in the labor market in that month. If in a single month the individual only receives an unemployment subsidy then he/she is considered unemployed in the same month. If he/she receives both an unemployment subsidy and a wage then his status – employed/unemployed – is the most prevalent during the month. In the unlikely event of a draw, priority is given to employment.

IEFP data contains information on every registered unemployment episodes and, if that is the case, spells of participation in active labor market programs independently of their type. We keep the information on the initial and final dates of all spells of registered unemployment and program participation. Episodes that are still open at the end of the observation period (Dec 2013) are treated as censored. Individual histories are also censored whenever there is an inconsistency in the information describing his/her status (and deleted from then onwards).

A number of corrections to the timing of the events in individual histories were made whenever the initial and final dates of episodes of the same type obtained from the two sources were not consistent. Typically, for overlapping episodes of the same type we created a unique episode keeping the minimum of the initial date and the maximum of the final date of the two original

episodes. Additionally, for overlapping episodes of different types we gave preference respectively to the active labor program episode, employment as recorded in the social security data and we modified the initial dates as well as the final dates to remove any remaining inconsistencies. Multiple observations of overlapping treatments of the same type were summarized into a single episode of treatment (this reduced the number of observations by just over 3 million).

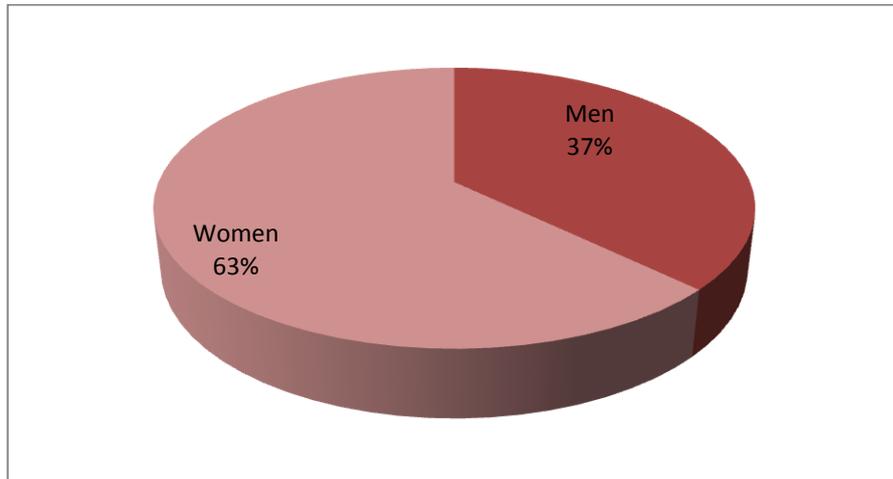
#### **4. Descriptive Statistics**

In the dataset we have information on the universe of traineeships organized under this program between 2004 and 2013, a total 148,857 traineeships that were taken by 146,030 individuals. According to the program rules, repeated participation is not allowed except in exceptional circumstances. This is, in fact, what the data show – 98.1 percent of the total number of participants participated in the program only once. For the purposes of estimating the impact of treatment (section 5) we will consider only the first instance of traineeship.

In this section, we provide descriptive statistics for the universe of participants in the program. The corresponding information for the sub-sample considered for the purpose of the evaluation of the causal effects of traineeships is provided in the next section (where a comparison between participants and non-participants is also included).

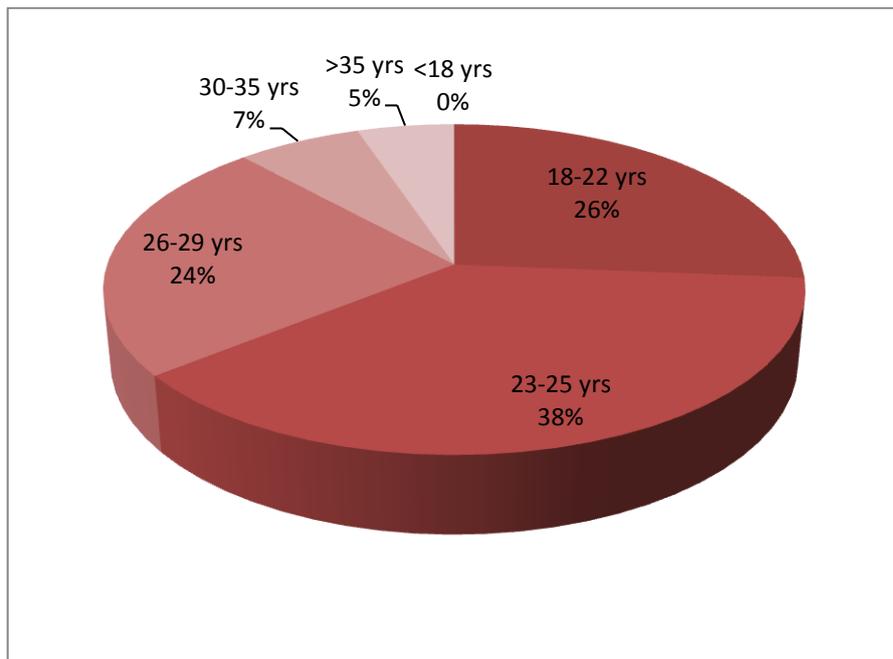
Participants are predominantly female (62.8 percent) and between 23 and 25 years of age. Individuals older than 30, eligible for participation only for a short sub-period of time or in exceptional circumstances, represent 11.7 percent of the total number of participants. Nearly two thirds (65.7 percent) of all participants have a university degree.

**Figure 1. Participants in the Program, by Gender**



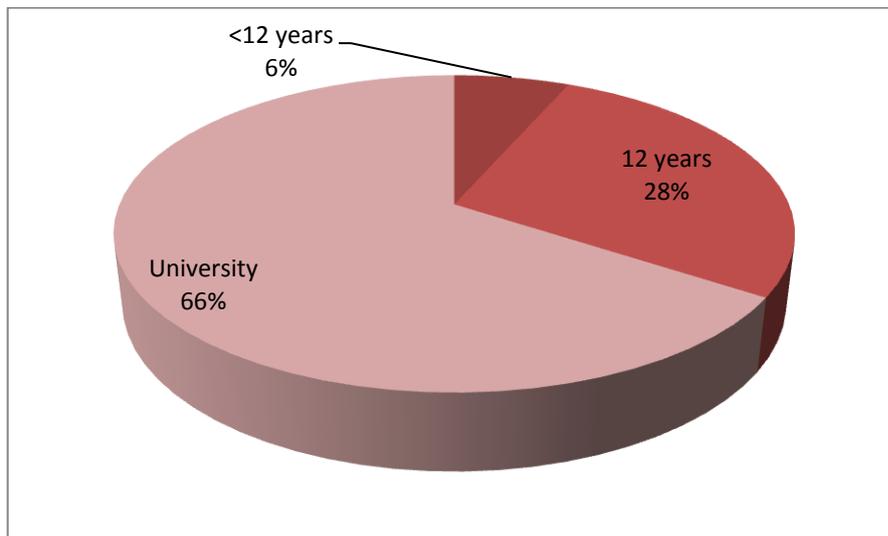
Source: IEPF

**Figure 2. Participants in the Program, by Age**



Source: IEPF

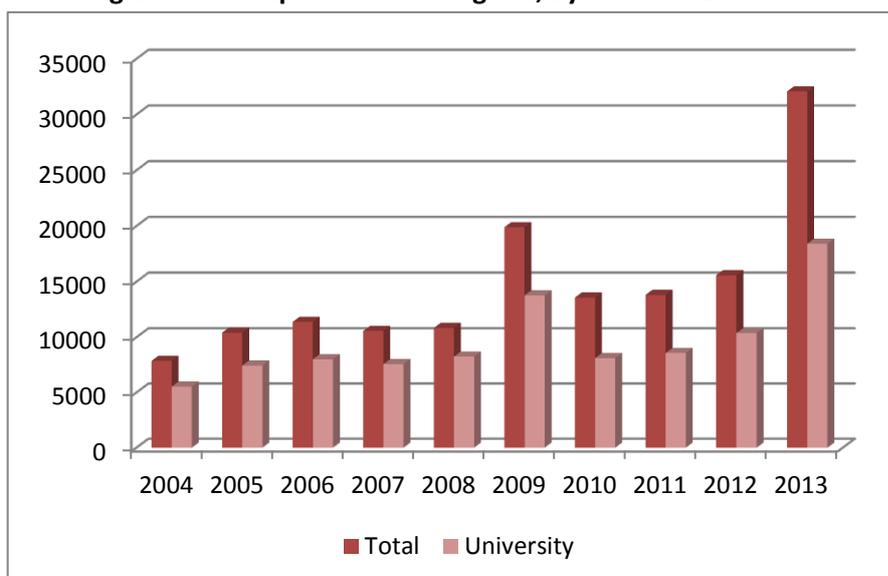
**Figure 3. Participants in the Program, by Education**



Source: IEFP

The number of participants increases gradually from the beginning of the observation period in 2004 (7,863) to the end in 2012 (15,583) with two marked peaks, the first in 2009 (19,850) and the second in 2013 (32,076). The increase in the total number of participants over the years is due mostly to the increased participation of individuals without a university degree who accounted for more than 70 percent of the total in the beginning of the period but only for 57 percent in 2013.

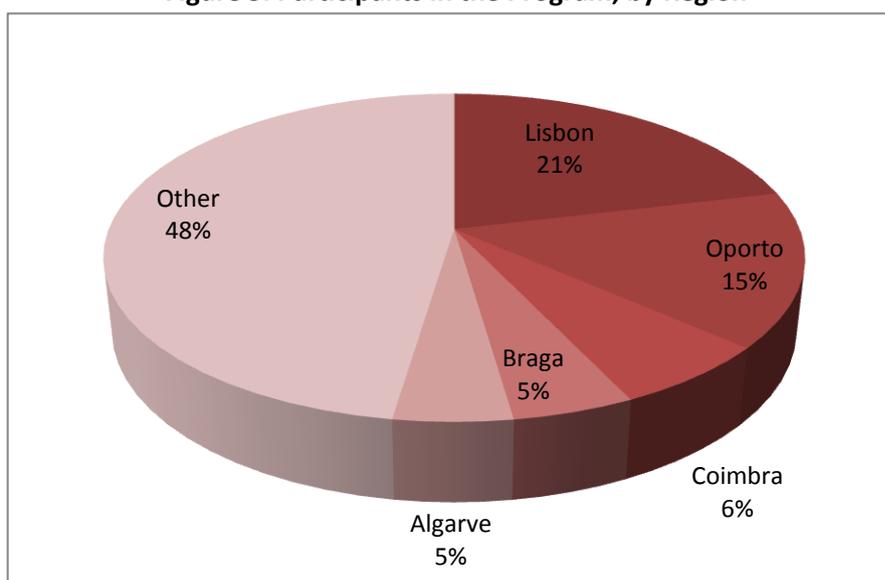
**Figure 4. Participants in the Program, by Year and Education**



Source: IEFP

Spatially the program is very concentrated in the two largest urban areas – Lisbon and Oporto – which account for 36 percent of all internships. Adding up the share of three other regions – Braga, Coimbra and the Algarve – we have 50 percent of all traineeships represented. This result is the natural counterpart of the spatial concentration of the economic activity in the Portuguese coastal line regions, especially, between Oporto and Lisbon. It also shows the dependence of the program on the existing local capacity to offer traineeships.

**Figure 5. Participants in the Program, by Region**

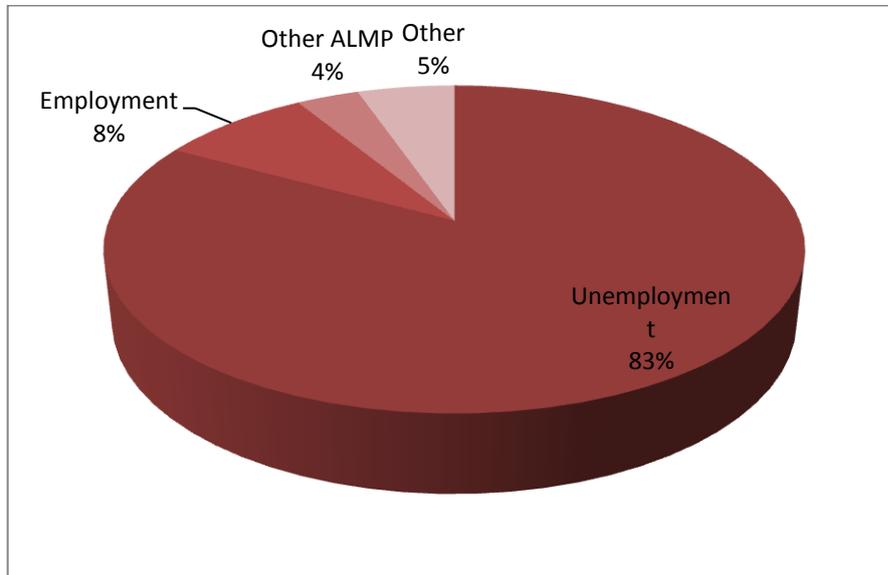


Source: IEFP

For 13,264 individuals out of the 146,030 (i.e., 9.1 percent) that participated in traineeships, the participation corresponds to their first record of any in the data set, meaning that the traineeship is in fact their first step in the labor market.

For the vast majority of participants in the program (115,636), participation happens after some time in unemployment. For those moving from unemployment into the program, the average waiting time is 6.5 months. This suggests that eligible candidates failing to find a job soon after entering unemployment are very quickly assigned to a traineeship. There are, of course, exceptions – the data show that the waiting time is longer than 12 months for 10 percent of the participants.

**Figure 6. Participants in the Program, by previous labor market status**



Source: IEFPP

For 8 percent of the individuals in the sample, the participation in the program occurs during an unemployment episode that follows an employment spell. In these cases, the waiting time since entry to unemployment and the beginning of the traineeship is 5.5 months, slightly less than the overall average. It is also worth noting that the average duration of the employment spell that led to the unemployment episode and to the participation in the program is itself very short (10 months).

For those who take a traineeship after participating in another ALMP program (4 percent of the total), the waiting time is even shorter (4 months) with virtually all these individuals being assigned to the program within a 9-month period.

## **5. Evaluation of the Causal Effects of the Program**

### **5.1. Preliminary Remarks**

This chapter discusses the estimated effects of the traineeship program offered through the Employment and Vocational Training Institute (IEFP). We focus on treatment episodes taking

place between 2007 and 2013 to allow for historical information to be gathered for at least 2 years prior to treatment. We look at the effect of this program on the probability of future employment of participants.

The objective of our approach is to identify the causal effect of participation in traineeship on employment, separating it from alternative explanations. The difficulty of isolating the causal effect of other alternative explanations resides in the impossibility of observing any individual simultaneously in two states: having and having not participated in a traineeship. The literature emphasizes the fact that it is not possible to identify the individual effect of the participation without making very strong hypotheses.

The most direct and simple method of assessing the effects of participation compares the average values of the outcome of interest for the subgroups of participants and non-participants. However, in non-experimental applications the two groups may be selected by non-random processes. In such case it is generally not legitimate to assume that treated and non-treated are comparable. Hence, the observed average value for the non-participants cannot be taken as the counterfactual outcome unless strong evidence is provided to support the hypothesis of randomness in the selection process.

In general, where the assumption of randomness in the selection process is not possible or not intended, the choice of the methodology of construction of the unobserved counterfactual should depend on the specific application and the available data. In this report, we adopted a matching methodology especially designed to deal with the choice of program (amongst various alternative treatments) and timing of participation. The method that was used is described in further detail in the following section. Section 5.3 describes the construction of the dataset for the causal evaluation exercise and section 5.4 discusses the results.

## **5.2. Methodology**

Henceforth, we will refer to the subgroup of the individuals participating in traineeship as the treatment or treated group, and the subgroup not participating as the control or non-treated

group; treatment refers to traineeship; the variable of interest for measurement of effects is called the outcome.

The fundamental problem of the non-experimental assessment studies arises from the fact that the treatment and control groups differ in various dimensions other than treatment itself. For this reason, any direct estimation confounds the differences between groups with the effect of the treatment, identifying a relationship between participation and the outcome which could not have been attributed exclusively to the effect of the treatment.

The matching method overcomes this problem via the direct construction of the counterfactual (see Heckman, Ichimura and Todd, 1998, and Heckman, Ichimura, Smith and Todd, 1998). The idea is that, in the presence of detailed information on the characteristics of the individuals in all the relevant dimensions, it is possible to 'match' treated and non-treated individuals in order to eliminate differences between the two groups which are not due to participation in the program. This removes from the analysis any effect of systematic differences in observed variables between the two groups and, under certain conditions, allows us to attribute the differences observed in the outcome variables to the program.

However, it might not be possible to find non-treated individuals with the same observed characteristics as each of the treated individuals. In this case, it will not be possible to reproduce the sample of treated individuals amongst the control group and the estimator will be valid exclusively for the subsample of represented treated individuals amongst the non-treated individuals.

The matching method is very demanding in terms of data, since it requires the observation of all the relevant variables in the selection process which, simultaneously, explain the potential outcomes. In the case of this condition not occurring, the matching estimator may be biased since it does not ensure the elimination of relevant systematic differences between the two groups.

In assessing the effects of active labor market programs (ALMP), the literature recommends particular care should be taken in characterizing the employment history as it is considered a good indicator of the long-term individual attitudes in the labor market and the opportunities

he/she faces (see Heckman, Ichimura, Smith and Todd, 1997, Blundell and Costa Dias, 2009). Using the rich longitudinal administrative data, we develop a matching procedure that does exactly this. In constructing the missing counterfactual, we will rely on a detailed and rigorous characterization of the individual employment, registration and treatment history, as well as on other important demographic information. Moreover, we acknowledge that individuals face multiple treatment choices as many programs are on offer, and that the time of treatment is not exogenous.

For these reasons, we developed a matching method for dynamic selection processes, based on earlier developments by Lechner (2002) and especially Sianesi (2004). Estimation is implemented in two main steps. *Step 1* performs an exact matching on the timing of entry into unemployment and the duration of unemployment up to the start of the traineeship. This means that the sample of potential controls for a treated individual registering with an Employment Office at time  $t_0$  and moving into traineeship at time  $t \geq t_0$  is restricted to those individuals registering at the same time  $t_0$  and still registered and in open unemployment after  $t$  periods (i.e., who are at risk of participation at time  $t$ ). This ensures that aggregate labor market conditions are fully accounted for. Moreover, we focus exclusively on the first treatment after registration to exclude simultaneous treatment decisions in different programs and the extent of anticipating behavior. Hence both the treatment and the control groups are observed in open registered unemployment between time  $t_0$  and  $t$  when, at last, the treated start a traineeship and the controls do not. Crucially, we do not control for any events happening after time  $t$  as it is possibly a consequence of the treatment status itself (hence endogenous). The control group thus constructed includes untreated individuals who reach the same unemployment duration without having participated in a program as the treated individuals, but not starting a traineeship at the same time that the treated do. They may, however, be treated in the future, but they cannot have been treated in the past.

*Step 2* seeks to control for other differences which might be related with the potential outcomes. Control variables include a detailed characterization of the age (five groups) and schooling (three groups), gender, district (24 districts) and, crucially, the history of employment, treatment (participation in any type of active labor market programs) and registered

unemployment over the two years prior to the start of the current registration spell. To reduce the dimensionality of the problem, we match on the probability of treatment as a function of these control variables (propensity score matching).

We measure the effect of the traineeship on the probability of employment of the participants after the start of the traineeship. We used nearest neighbor matching on up to 20 controls with a caliper. The standard deviations of the estimators were calculated as in Abadie and Imbens (2006).

In summary, the treated are individuals registering as unemployed at some point during our estimation period (to be defined below) and starting a traineeship before getting any other treatment since registration. The controls are similar individuals, who register in unemployment at the same time as the treated, share a common history with the treated and remain unemployed and without being treated for the duration that takes the treated to enrol into treatment. The counterfactual for any individual treated at time  $t$  includes the possibility of future treatment. Notice that the dynamic matching method we develop here implies that the same registration spell can belong, at different stages, to both the treated and the control samples. For instance, a spell leading to a treatment starting 6 months after registration will belong to the pool of potential controls up to month 5 and to the pool of treated from month 6 onwards. The counterfactual it represents while in the control group include the treatment episode that happens in the future.

### **5.3. Construction of the Sample**

Our data results from the merging of three longitudinal administrative datasets containing information of the employment, registered unemployment and participation in active labor market programs for the universe of individuals ever registering as unemployed between January 2005 and December 2013 (more details can be found in the data section above). To ensure that an entire two years of pre-registration data is observed – a critical piece of information in our matching procedure – and that we follow each registration spells for at least

1 year, we constrained the estimating sample to individuals registering between January 2007 and December 2012.

After corrections (described below) and imposing the estimation period to 2007-2012, the data contains 1,147,422 individuals, of which 17,021 (1.48 percent) participated in the program.

A large reduction on the number of trainees in the sample resulted from the processes of data cleaning and the limitation of the estimation period. The two main drivers of the drastic cut in the number of trainees are the following. *First*, we restricted attention to registration spells following an employment period. This condition eliminated around 70,000 treatment observations (over half of the original sample) as many trainees are first-job seekers. However, the incentives these individuals have to register are very different from those faced by individuals who have been employed. The latter need to register to become entitled to unemployment benefits, and so we expect them to register soon after the end of an employment spell. The former, however, are not entitled to benefits so have a much weaker incentive to register. They will surely do so if willing to take a traineeship they found themselves, as these must go through the Employment Office; but it is not clear they will do it otherwise. This implies that there may be selection in the registration process that we are, at this stage, unable to control for since we have no information on the population of first-job seekers.

*Second*, around 38,000 observations are dropped due to the focus on registered unemployment spells starting between January 2007 and December 2012. Additionally, we consider only the first episode of traineeship in the case of multiple treatments and treat subsequent traineeships as part of the outcome. This, however, affects only a small number of individuals (just under 3,000 individuals, less than 2 percent of those who ever take a traineeship).

As explained, the analysis we carry focuses exclusively on individuals who have had past employment experiences. Without further information we cannot tell whether the results apply to first-time job seekers or not. We should note, however, that in previous work on apprenticeship programs we faced a similar problem and concluded from preliminary analysis that the results are qualitatively similar for both groups. Although it would be desirable to look at the effects of traineeships on those moving into the labor market for the first time as, in

particular, this is the main target group for this program, we currently lack the data that would allow us to do so. Specifically, and as suggested above, it requires observation of individuals completing their education life, irrespective of registration with the Employment Office, and their subsequent working/treatment life. Although it exists, and despite the team efforts, it was not yet possible to access the data.

The methodology we use implies that the same individual spell may be simultaneously in the treatment and control groups, but at different stages of the spell. Controls are selected from the subset of individuals with similar characteristics who registered at the same time as the treated but remain in open unemployment when the treated become so. Crucially, controls may be treated at a later stage of their unemployment spell. Such treatment is part of the outcome counterfactual when their observation is considered in the control group, but becomes treatment when considering treatment at the duration they take to be so. So assessing the quality of the match is more difficult than in standard settings. Table 1 to 4 below show the balancing tests pre-and-post-matching, where the former compare treated and never treated and the latter uses the matched control sample at each time of treatment. Tables 1 and 2 refer to men, while tables 3 and 4 refer to women. In both cases, the samples of treated and never treated are very different with respect to all observed variables. Matching reduces differences remain statistically significant, but they are qualitatively small.

Table 1: Distribution of observed variables - men, before matching

	Never treated		Treated		Difference	
	mean	SE	mean	SE	t-test	p-val
Employment and participation history: last 1 year						
% time employed	0.622	0.001	0.386	0.006	43.080	0.000
% time in subs unemployment	0.057	0.000	0.053	0.002	1.750	0.080
% time in ALMP	0.005	0.000	0.008	0.001	-3.898	0.000
continuous employment	0.154	0.001	0.106	0.005	8.889	0.000
no ALMP	0.987	0.000	0.983	0.002	2.529	0.011
Employment and participation history: last 2 years						
% time employed	0.595	0.001	0.345	0.005	47.311	0.000
% time in subs unemployment	0.077	0.000	0.061	0.002	6.326	0.000
% time in ALMP	0.008	0.000	0.011	0.001	-3.719	0.000
continuous employment	0.101	0.001	0.061	0.004	8.931	0.000
Education distribution						
12 years or more	0.289	0.001	0.848	0.005	-83.668	0.000
university	0.050	0.000	0.102	0.004	-16.018	0.000
Age						
19-22	0.216	0.001	0.201	0.006	2.554	0.011
23-25	0.185	0.001	0.353	0.007	-29.027	0.000
26-30	0.253	0.001	0.333	0.007	-12.386	0.000
31-35	0.345	0.001	0.113	0.005	33.175	0.000
Year registered as unemployed						
2007	0.274	0.001	0.175	0.006	14.989	0.000
2008	0.255	0.001	0.237	0.006	2.827	0.005
2009	0.285	0.001	0.371	0.007	-12.879	0.000
2010	0.187	0.001	0.218	0.006	-5.315	0.000
Nr of observations	226268		4655			

Table 2: Distribution of observed variables - men, after matching

	Controls		Treated		Difference	
	mean	SE	mean	SE	t-test	p-val
Employment and participation history: last 1 year						
% time employed	0.368	0.006	0.372	0.006	0.418	0.676
% time in subs unemployment	0.043	0.002	0.051	0.003	2.475	0.013
% time in ALMP	0.006	0.001	0.007	0.001	1.147	0.251
continuous employment	0.108	0.005	0.106	0.005	-0.304	0.761
no ALMP	0.987	0.002	0.983	0.002	-1.309	0.190
Employment and participation history: last 2 years						
% time employed	0.329	0.006	0.333	0.006	0.482	0.630
% time in subs unemployment	0.054	0.002	0.058	0.002	1.098	0.272
% time in ALMP	0.008	0.001	0.011	0.001	1.321	0.187
continuous employment	0.065	0.004	0.060	0.004	-0.942	0.346
Education distribution						
12 years or more	0.862	0.005	0.870	0.005	1.123	0.261
university	0.101	0.005	0.100	0.005	-0.126	0.899
Age						
19-22 years old	0.178	0.006	0.196	0.006	2.014	0.044
23-25 years old	0.361	0.008	0.361	0.008	-0.010	0.992
26-30 years old	0.352	0.008	0.337	0.007	-1.385	0.166
31-35 years old	0.109	0.005	0.106	0.005	-0.394	0.694
Year registered as unemployed						
2007	0.157	0.006	0.173	0.006	1.874	0.061
2008	0.243	0.007	0.236	0.007	-0.783	0.434
2009	0.391	0.008	0.382	0.008	-0.808	0.419
2010	0.209	0.006	0.209	0.006	0.078	0.938
Nr of observations	3997		3997			

Table 3: Distribution of observed variables - women, before matching

	Never treated		Treated		Difference	
	mean	SE	mean	SE	t-test	p-val
Employment and participation history: last 1 year						
% time employed	0.611	0.001	0.408	0.004	49.506	0.000
% time in subs unemployment	0.092	0.000	0.085	0.002	2.923	0.003
% time in ALMP	0.010	0.000	0.008	0.001	2.717	0.007
continuous employment	0.160	0.001	0.121	0.004	9.772	0.000
no ALMP	0.974	0.000	0.981	0.001	-3.903	0.000
Employment and participation history: last 2 years						
% time employed	0.574	0.001	0.348	0.004	57.189	0.000
% time in subs unemployment	0.120	0.000	0.097	0.002	9.877	0.000
% time in ALMP	0.015	0.000	0.011	0.001	3.825	0.000
continuous employment	0.103	0.001	0.069	0.003	10.230	0.000
Education distribution						
12 years or more	0.428	0.001	0.871	0.004	-82.263	0.000
university	0.066	0.000	0.074	0.003	-2.717	0.007
Age						
19-22	0.190	0.001	0.230	0.005	-9.143	0.000
23-25	0.191	0.001	0.395	0.005	-46.941	0.000
26-30	0.267	0.001	0.276	0.005	-1.954	0.051
31-35	0.352	0.001	0.099	0.003	48.685	0.000
Year registered as unemployed						
2007	0.334	0.001	0.210	0.004	24.160	0.000
2008	0.267	0.001	0.253	0.005	2.996	0.003
2009	0.234	0.001	0.327	0.005	-20.064	0.000
2010	0.165	0.001	0.210	0.004	-11.172	0.000
Nr of observations	288314		8557			

Table 4: Distribution of observed variables - women, after matching

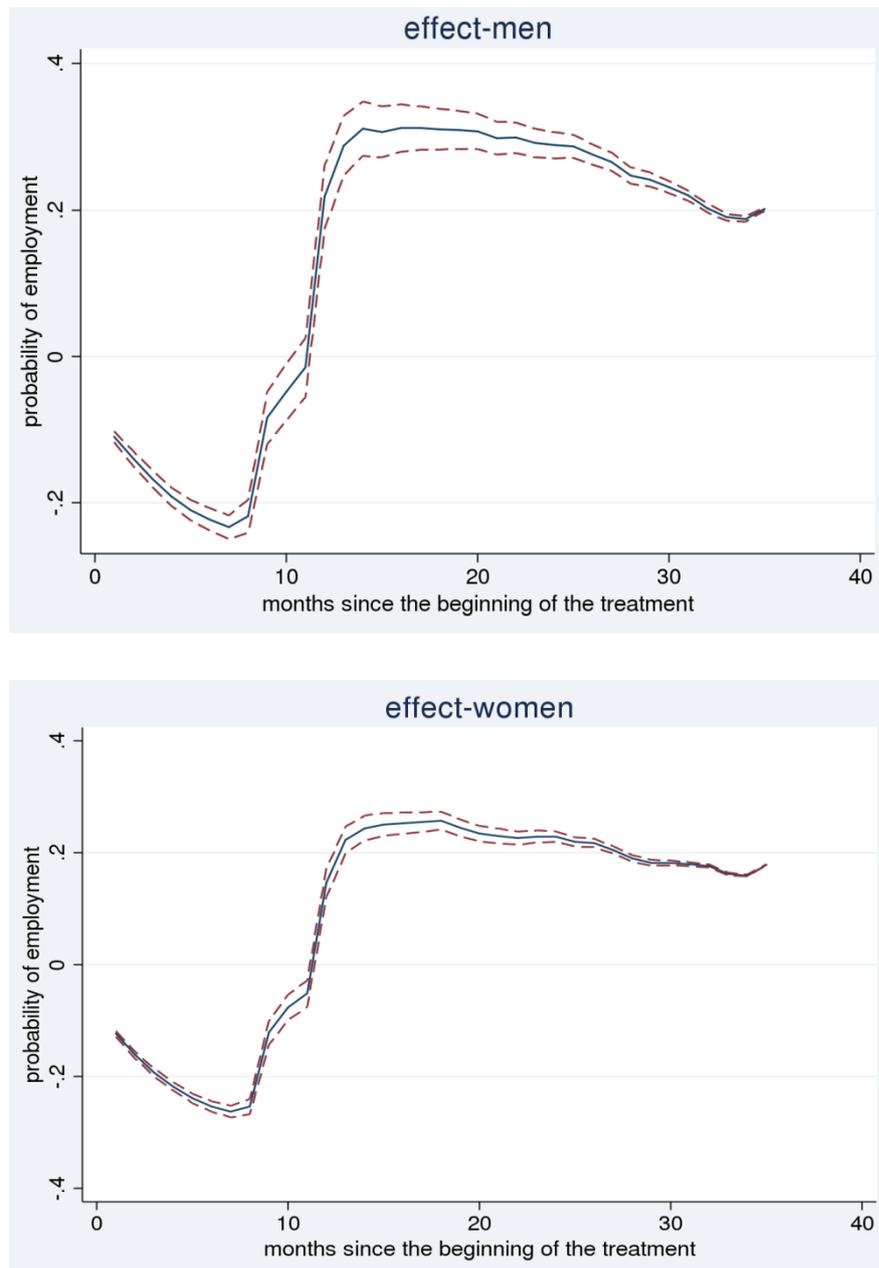
	Controls		Treated		Difference	
	mean	SE	mean	SE	t-test	p-val
Employment and participation history: last 1 year						
% time employed	0.386	0.005	0.399	0.004	2.081	0.037
% time in subs unemployment	0.069	0.002	0.087	0.002	5.711	0.000
% time in ALMP	0.005	0.001	0.007	0.001	2.019	0.044
continuous employment	0.119	0.004	0.119	0.004	-0.001	0.999
no ALMP	0.987	0.001	0.982	0.002	-2.445	0.015
Employment and participation history: last 2 years						
% time employed	0.333	0.004	0.337	0.004	0.697	0.486
% time in subs unemployment	0.083	0.002	0.096	0.002	4.317	0.000
% time in ALMP	0.008	0.001	0.011	0.001	2.137	0.033
continuous employment	0.072	0.003	0.068	0.003	-0.899	0.369
Education distribution						
12 years or more	0.857	0.004	0.898	0.004	7.622	0.000
university	0.106	0.004	0.069	0.003	-7.919	0.000
Age						
19-22	0.225	0.005	0.232	0.005	0.995	0.320
23-25	0.412	0.006	0.406	0.006	-0.794	0.427
26-30	0.274	0.005	0.278	0.005	0.609	0.542
31-35	0.089	0.003	0.084	0.003	-1.063	0.288
Year registered as unemployed						
2007	0.189	0.005	0.212	0.005	3.468	0.001
2008	0.263	0.005	0.251	0.005	-1.660	0.097
2009	0.351	0.006	0.335	0.005	-2.151	0.031
2010	0.197	0.005	0.203	0.005	0.897	0.370
Nr of observations	7433		7433			

#### 5.4. Estimates

In the first step, we estimated the effect of participation in the traineeship program on the participants' employment probability, by gender and over time. Time is measured in an individual-specific clock that is set to zero upon his entry to the program. Therefore, the timing of the production of the effects should be interpreted as x months after the individual entered the traineeship. The results are summarized in Figures 7 and in Table 2.

The results indicate that in the first 9-12 months of treatment, the program has a negative and large effect on the probability of employment of participants. For both men and women, the effect becomes null around the 12th month of participation (the maximum standard duration of traineeships during parts of the period analyzed) in the program. This result is clearly the consequence of a lock-in effect whereby participants, because they are participating in the program, reduce or suspend job search efforts and display lower job finding rates than otherwise similar workers that decided not to participate or to postpone participation in the program. However, the results also indicate that, as the program comes to an end, the employment probability of participants relatively to non-participants increases very rapidly: 12 months after entering the program, male participants are 21.8 percentage points more likely to be employed than non-participants with similar characteristics and labor market history. This positive effect becomes maximum at 18 months (6-9 months after the end of a typical traineeship) and, even though it declines over time) it remains positive and large (above 20 p.p.) even at a 36-month horizon (counted from the beginning of the participation). For women, the results are qualitatively similar but not as large: 12 months after entering the program, female participants are 14.7 percentage points more likely to be employed than similar female non-participants. The time-profile of the employment effects is similar for men and women.

**Figure 7. Estimated effects of the employment probability of participants in traineeships, by gender**

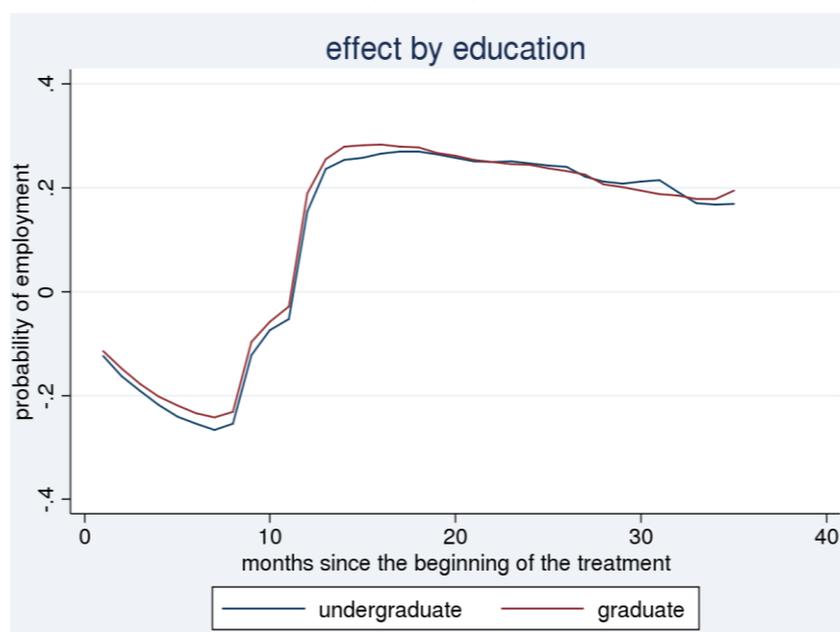


**Table 5. Estimated effect of the participation in a traineeship program on the probability of employment**

	Time (months) since the beginning of participation					
	6 m	12 m	18 m	24 m	30 m	35 m
<b>Men</b>						
employment rate	-.2229	.2177	.3103	.2885	.2312	.2014
s.d.	.0180	.0513	.0411	.0354	.0275	.0228
obs	3058	3058	2711	2195	1516	329
<b>Women</b>						
employment rate	-.2535	.1472	.2578	.2291	.1822	.1788
s.d.	.0147	.0400	.0321	.0263	.0201	.0161
obs	5487	5487	4942	4172	2931	644

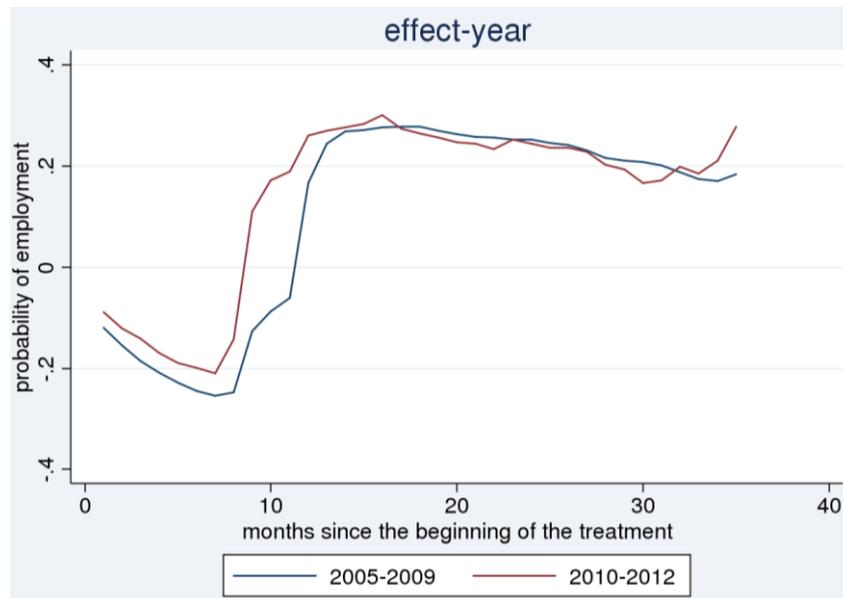
Although we do not report the results here, it is worth mentioning that the effects on the probability of registered unemployment of participants are also favorable to the program – in the 12<sup>th</sup> to 36<sup>th</sup> month after the beginning of the participation the probability of unemployment of participants is around 10 percentage points lower for participants than for non-participants. The effect is, once again, similar for male and female participants although smaller for women. We have seen before that there are two main groups of workers targeted by the program – with and without a university degree. Although the program is the only one implemented in the past that targets specifically workers with more than 12 years of education, we have also seen that traineeships have been extended increasingly to address the situation of workers with fewer education. This raises the question of whether the program is equally effective for the two subgroups or if, on the contrary, it only works in the case of its initial target group. To address this issue, we estimated the effects of traineeships on the two groups. Results are summarized in Figure 8. They indicate that the program is equally successful in promoting transitions to employment of workers with and without an university degree thereby validating the decision to increasingly offer the program to less educated unemployed workers as well.

**Figure 8. Estimated effects of the employment probability of participants in traineeships, by education**



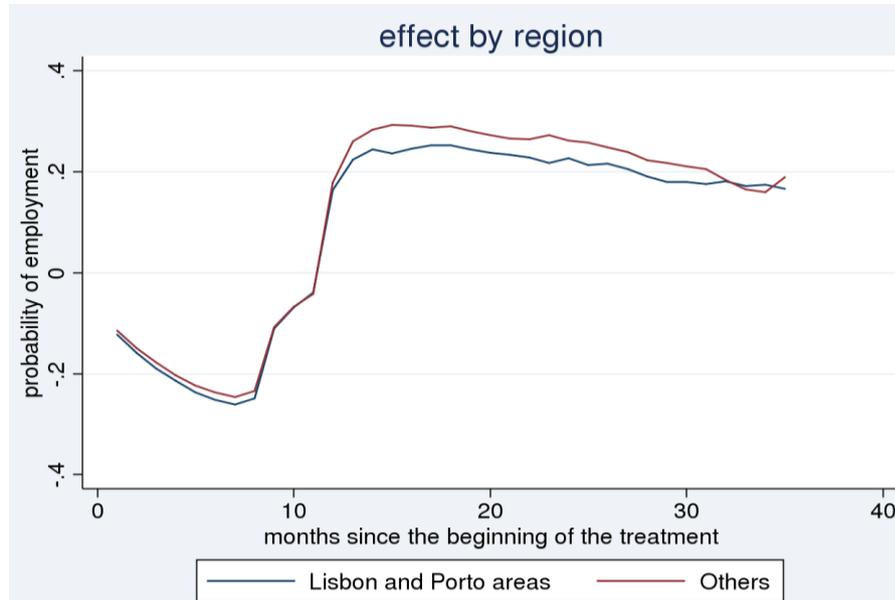
Two other dimensions – time and space – were considered in the analysis. First, we estimated the effects of participation on the employment probability of participants that initiated the participation in the first and in the second half of the 2007-2012 period. This is motivated by the fact that from 2010 onwards the economic recession that hit Portugal following the international financial crisis had especially negative effects in the labour markets. Therefore, we would like to know if the effectiveness of the program is somehow different when unemployment is high or low. Unfortunately, however, there were also changes in the eligibility rules and treatment around the same time. In particular, the duration of treatment was reduced from 12 to 9 months. The results, summarized in Figure 9, show indistinguishable effects of the program after 12 months of enrollment for the two subperiods, suggesting the effects may be quite robust to the aggregate economic conditions.

**Figure 9. Estimated effects of the employment probability of participants in traineeships, by period**



In Portugal, unemployment and employment opportunities display significant regional variation. Given the specific nature of traineeships and, in particular, the fact that they very spatially concentrated in the more developed areas where the capacity to organize traineeships is greater, we also estimated the effects of the program separately for the two larger metropolitan areas in Portugal (Lisbon and Oporto) and the rest of the country. Results are plotted in Figure 10.

**Figure 10. Estimated effects of the employment probability of participants in traineeships, by region**



Once again, the results do not show large (if at all) differences in the two sub-regions. If anything, the program works best, in the sense that it increases the probability of employment slightly more, in regions with less employment opportunities than elsewhere. Again, the indication is that the success of this program is magnified, not the contrary, in labor markets where unemployment is higher and employment opportunities scarcer.

## 6. Summary of findings

We analysed a large employment program – traineeships – implemented in Portugal since the late 1990s and specifically targeted at youth unemployed individuals and, for the most, with at least 12 years of education. The purpose is to estimate the causal effect of the program on the employment probability of the participants in the post-participation period.

Given the specific nature of the intervention and, in particular, the fact that participants may choose between three alternatives – participate in the program, participate in another active labor market program and not participate in any program keeping the option of participating in a later date – we have adopted a matching method for dynamic selection processes. The

method was implemented on data obtained from three different sources that allows us to select individuals as they enter unemployment and follow them for a reasonably long period of time. For some individuals, these unemployment spells lead to participation whereas for other they will not. Although this procedure allows us to account for the past and future labor market history of the individuals it does so at the cost of leaving out of the analysis those participants that entered a traineeship before they had any employment experience. Our results should be considered with this caveat in mind.

The results show that traineeships, while having a severe lock-in effect in the first 9-12 months since entry to the program, they significantly raise the employment probability of the treated relatively to the non-treated (by 10 to 20 percentage points) and that this effect persists for the most part for a relatively long period (two years). We find significant variation in the program effectiveness between male and female participants, the most positive effects being found in the case of men. No significant differences were found for different schooling subgroups. This later result somehow validates the political decision to increasingly extend the program to more workers without university education. Finally, our results also show that the positive effects of the program are not hindered by difficult labor market conditions. The results are equally as positive during the period of high and rising unemployment and in regions with fewer employment opportunities.

Although there are not many studies against which our results may be compared, it is reasonable to conclude that the results we obtained are in line with the literature in two different aspects.

First, like the majority of papers on the estimation of the employment effects of similar programs, we conclude that traineeships do increase the employment prospects of participants. This is in line with different studies focusing in training programs in general, even if our estimates indicate larger positive effects. Such difference should be considered in the context of other studies that show that employer-provided training, as is arguably the case with traineeships, of all types of training is arguably the most effective.

Second, also in accordance with the literature, our results show that it is in the mid-run that traineeships produce the largest positive effects, their short-run effects being reduced by

severe lock-in effects. As in Card *et al.* (2015) and especially in the period immediately after the end of program participation, the effects are more positive in times of slow economic growth.

Future work on the evaluation of this program as well as on other programs targeted at first-job seekers should focus on including also individuals without previous employment experience. That implies merging the existing data with data from the schooling system. If it is true that this report contributed to consolidating routines of data gathering and assembling among the institutions holding those data for other purposes and making them available for evaluation purposes as well, the truth is that, at this level, this study major contribution, is to have set the stage for next rounds of evaluation of active labor market programs in general may be able to use education data. This opens many interesting additional alternatives to building the counterfactual and thereby will help to produce even more robust results.

Having said that, this report confirms in a different setting (exclusively focused in traineeships and for a period of time richer in events) the results previously obtained by Costa Dias and Varejão (2012) who consider the entire set of active labor market programs. That the results in the two studies are entirely consistent is an indication of their robustness.

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### **III**

## **Capacity building and results dissemination**

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In view of the results of the two counterfactual evaluations, the Cohesion and Development Agency, as project coordinator, recognizes the importance of promoting the dissemination of the results at different levels – policy makers, public agencies responsible for programme implementation, Operational Programme Managing Authorities, evaluators and researchers, media and citizens.

After the conclusion of the project final report and the beginning of the new political cycle (following the October 2015 elections), the results will be properly publicised within the relevant policy makers.

As regards the representatives of the public agencies responsible for programme implementation, which were part of the project partnership, training workshops on counterfactual methods were implemented throughout the process, including the presentation of the results of the research and the discussion of methodological difficulties. A partnership meeting is also planned to analyse the results and to formulate further developments, particularly in the creation of routines for the collection and treatment of administrative data to facilitate future counterfactual analysis in these policy domains.

Special attention will be given to the dissemination of results within the Portugal 2020 Evaluation and Monitoring Network, which comprises all the ESIF Managing Authorities. For this particular target group, a specific action was taken on Counterfactual Impact Evaluation to inform about the advantages and the limitations of this type of impact evaluation. Aiming productive outcomes, this action was held conveniently during the preparation of the Global Evaluation Plan/GEP allowing for the incorporation in the GEP of six counterfactual impact evaluations, three of which in ESF funded operations.

Besides this training action, the Cohesion and Development Agency intends to hold an event within the Evaluation and Monitoring Network to present the results of the two studies of this project, with the objective of deepening possible implications in actions of the Operational Programmes that deal with employment, training and education issues.

The public presentation of the project results is also foreseen, including the diffusion through the media and the online release of the final study.

To enhance the acquired knowledge within the evaluators' community is also deemed important. This will be achieved through the implementation of at least one training session on counterfactual evaluation methods. This action can also be extended to relevant academic research centres.

The training actions will be supported by theoretical tools such as the guide published by DG Employment, Social Affairs and Inclusion "Design and commissioning of counterfactual impact evaluations" translated into Portuguese. This publication is undergoing the necessary graphic design for online release in the sites coordinated by the Cohesion and Development Agency.

In short, the Cohesion and Development Agency is planning to implement concrete training and dissemination actions in the last quarter of 2015, directed to particular target groups (politicians, managing authorities, evaluators and citizens). These actions will focus on the benefits of the counterfactual methods for impact evaluation of public policies and also on the specific results of the evaluation of two public programmes aimed by this pilot project.



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