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# Synthesis report on the 'Pilot projects to carry out ESF related counterfactual impact evaluations'

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Abstract

**Synthesis report on the 'Pilot projects to carry out ESF related counterfactual impact evaluations'**

In order to measure the causal effect of a policy, a specific approach called 'counterfactual impact evaluation' is needed. This report highlights that data access, networking, capacity building and taking evaluation requirements into account during the policy implementation are key for shifting to a culture of causal evaluation of policies. These results derive from eight pilot projects funded by DG Employment, Social Affairs and Inclusion to foster the measurement of causal effects of European Social Fund policies.



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## Foreword

The European Social Fund helps to improve the lives of millions of people in Europe each year by investing in their training and skills to help them find better jobs. The current Multiannual Financial Framework for 2014-2020 has proposed a stronger results orientation of the EU budget to enhance the contribution of the funding instruments to the implementation of the EU policies and make visible their achievements.

From the Commission perspective, the requirement by the ESF regulation of reporting a set of common output and result indicators collected on each individual participant benefitting from an ESF intervention (what we call micro-data) is definitely a step forward. It will allow a more robust monitoring of the ESF as well as a more robust platform to evaluate the impacts of the ESF investments at all levels: EU, national, programme, thematic and investment priorities.

There is an increased political interest in demonstrating the impacts of the European programmes. The question is not just what has been achieved with the funds, but also whether they have made the difference, namely, what would have been the results in the absence of the intervention. One approach to capture such net impacts is through counterfactual impact evaluations. In order to identify the net effects, it compares the group of programme participants (the treatment group) with a group of people who might have been targeted but were not subject to the programme (the control group).

In recent years DG EMPL has implemented a range of initiatives to support the production of evidence on impacts of ESF interventions. In 2012 we published a practical guidance for ESF managing authorities to design and commission counterfactual impact evaluations.

In 2013, DG EMPL set up the Centre for Research on Impact Evaluation (CRIE) at the Joint Research Centre; through its annual work programme CRIE provides scientific expertise and methodological support to the Commission and Member States for the evaluation of the impact of ESF funded interventions and other financial instruments managed by DG EMPL.

To encourage the practical implementation of the counterfactual impact evaluation (CIE), in 2013 DG EMPL launched two calls for proposals, addressed to ESF managing authorities, to co-fund '*Pilot projects to carry out ESF related counterfactual impact evaluations*'. Eight pilot projects were funded in Spain, Italy (two projects), Estonia, Portugal (two projects), Lithuania and Slovakia. They covered a wide range of interventions in the areas of active labour market policies and vocational training. Throughout their implementation, CRIE assisted these projects in analysing and addressing specific data problems and advising on appropriate methodologies.

These pilot projects have proven that counterfactual impact evaluation is feasible and can be done within the ESF. Of course, in some cases, implementation faced many challenges, for example in terms of data access and data merging. However, the pilots have overall produced useful results and the lessons have been valuable for the preparation of 2014-2020 programmes. The results of the pilot CIEs have already enriched the knowledge base on the effectiveness of some ESF interventions.

The presentation and discussion of the results of the projects during the dissemination event held in Brussels on 12 November 2015 showed the relevance of the lessons learned from the pilots by other Member States and stakeholders. They are particularly relevant in view of the design and implementation of the Evaluation Plans for the 2014-2020 operational programs and especially the Youth Employment Initiative evaluation required for 2018.

This publication aims at making these experiences and results accessible to a wider audience.

DG EMPL remains committed to support the implementation of causal impact evaluation, capitalizing on the know-how of the CRIE, and to support the results-orientation of the EU budget.

**Francisco MERCHAN CANTOS**  
Director for Audit and Evaluation  
Directorate General for Employment, Social  
Affairs and Inclusion

## Executive summary

### Policy context

Only impact evaluations using *counterfactual methods* can isolate the causal effect of a policy and hence provide insights into its success. [A report of DG EMPL and the Centre for Research on Impact Evaluation \(CRIE\)](#) stipulates that there is a scarcity of counterfactual impact evaluations (CIEs) of European Social Fund interventions.

In order to promote an increased use of CIEs, in 2013 DG Employment funded eight pilot projects (call for proposals VP/2013/005 and VP/2013/015) on measuring the causal effect of ESF policies in the following countries: Spain, Italy (two projects), Estonia, Portugal (two projects), Lithuania and Slovakia.

This synthesis report summarises the results of these pilot projects, as well as the lessons learnt for increasing the implementation of causal impact evaluation of EU policies.

### Key conclusions

#### **Establishing networks and developing capacity building are crucial for the success of a CIE**

Networks created during the implementation of the eight pilot projects facilitate the development of a CIE culture within countries by creating trust, confidence and capacity in CIE methods among all stakeholders. The Italian, Spanish, Lithuanian and Portuguese projects stress the importance of building up networks between different stakeholders (i.e.: civil servants, data holders, evaluators and policy makers) to make the research possible.

In addition, networks enable investigating data availability, assuring goodwill of data holders given legal limitations for data delivery and getting access to unrecorded information important for CIE design (i.e. intervention logic and selection criteria of beneficiaries). In Portugal networks and capacity established during the execution of ESF pilot projects contributed to the current planning of several future CIEs. This spill-over effect of networks now established was also experienced in other pilot project countries.

#### **Expertise in CIE varied among the countries that implemented the pilot CIEs**

The analysts conducting the pilot projects had a varying initial level of expertise in using CIE, which might be due to differing acquaintance with CIE methods in the countries involved. The creation of a single European wide access point for calls for tender of CIE studies, as CRIE plans to create during 2016, could help make accessible the available expertise in Europe throughout all Member States.

#### **Data creation and provision are at the core of a successful CIE**

The main challenge encountered to carry out CIE analysis was the availability and access to a suitable data set on the control group. The feasibility of merging administrative data, often held by different agencies, was subject to countries' and regions' data protection laws.

In most cases, however, better planning and improved data quality would have increased the quality of evaluation. Since CIE were not accounted for in the design phase of the policy, most of the pilot projects had to use Propensity Score Matching (PSM) as

evaluation method, instead of other CIE methods that do not require strong assumptions difficult to meet in reality.

Several strategies can be devised to make available the data needed for CIE:

1. Data needs for CIE should be taken into account during the design phase of the policy to be evaluated.
2. The problems of merging different administrative data sets stored by different data agencies could be solved by the creation of a national centre responsible for administrative data linkage and delivery (as in place already in some European countries).
3. If data merging is not conducted by evaluators, information on data quality should be provided by the agency merging the data.

## Main findings from the evaluations

The Spanish, Estonian, Slovak, a part of the Lithuanian and Italian and Portuguese pilot projects examined different **vocational training programmes**.

The Italian, Spanish and Portuguese projects focused on young unemployed. They concluded that training for the young generally increased their employability as well as the number of weeks worked per year. For example, the employment rate of Italian participants increased between 4 to 11 percentage points in Piemonte, Autonomous Province of Trento (APTrento henceforth) and Veneto, and participants worked between 2 to 8 weeks more per year after 12 months in APTrento and Veneto, and after 24 months in Piemonte. In the Portuguese evaluation, traineeships were found to increase the probability of employment between 10 to 20 percentage points irrespective of participants' gender, education and location. However, the Italian pilot on training intervention shows that some socio-demographic groups were more likely to benefit from training.

Once the focus is on training provided for the entire workforce, the policies evaluated in the Estonian and Lithuanian pilots generally did not yield any significant causal effect on labour market chances or even prolonged unemployment and decreased earnings.

The Portuguese project focusing on pupils in upper secondary school concluded that the introduction of vocational training into the school curriculum increased educational attainment and decreased school dropout but lowered the chances to enrol in university.

The Lithuanian, Italian and Portuguese pilots investigated **active labour market policies** in a broader sense.

The Italian and Lithuanian pilot projects focusing on hiring incentives concluded that these policies increased the duration of employment. However, this was at high costs. In addition, for one Italian region substitution effects were at place since employers seemed to adapt behaviour in anticipation of a policy implementation.

The Portuguese project examined the causal effect of the 'Convocatorias' activation scheme. Unemployed were closely monitored and subject to a variety of possible training and employment actions. The probability of transition into employment doubled from 4% to 8% for those unemployed participating in the intervention compared to similar non-participants. The authors estimated the programme had a positive financial impact of 240 million euro over the first year of operation.

## 1 Introduction

Over the 2014-2020 programming period, the European Social Fund (ESF) will provide some €80 billion in funding to train people and help them get into work, promote social inclusion, improve education and training and enhance the quality of public services in Member States (MS). Articles 54 and 56 of the CPR Regulation<sup>1</sup> set out the need to evaluate the impact of the programmes.

In the wake of the recent economic downturn and in light of fiscal budget constraints, concerns about the effective use of funds have grown considerably. This has called for the need of conducting more impact evaluations so as to identify net effects of interventions funded by ESF, namely the effects of the intervention compared to the effects of the alternative scenario of not being supported by the intervention (the counterfactual). The application of CIE methods makes it possible to investigate the causal impact of a policy and the quantification of the net effects. The causal impact of a policy is important to judge about whether the policy works and to draw policy conclusions for future planning and make budgetary decisions (DG Employment, Social Affairs and Inclusion (DG EMPL) 2012).

### **Counterfactual impact evaluation (CIE)**

In contrast to other types of evaluations, CIE informs about the causal effect of a policy on its recipients. The distinctive feature of CIE is thus that it measures the impact of a given policy intervention by comparing the actual situation to the one that would have happened in the absence of the intervention. As such, CIE compares e.g. labour market outcomes of those who benefited from a policy (treated group) with outcomes of a so-called 'control group' of individuals, who are similar in all characteristics to the policy beneficiaries but their recipient status.

(For more detail see DG EMPL 2012)

Under the Structural Funds regulations for 2007-2013, MS were responsible for the ex-ante and on-going evaluations of their operational programmes (OPs). However, very few of the latter are counterfactual based. A previous report of the Centre for Research on Impact Evaluation (CRIE) (Bratu et al. 2014) analyses information on CIE evidence on labour market policies focusing on academic papers and reports published by the European Social Fund Expert Evaluation Network (ESF-EEN).<sup>2</sup> It shows that on average only 15 annual sources of CIE evidence were available in Europe between 2007 and 2013.

This might be due to the case that the use of CIE for measuring the causal impact of labour market policies faces a number of requirements. First, CIE needs data on those individuals who did not undergo treatment. These data are generally not easily obtained if the evaluation needs are not already taken into account during the implementation of the policy. Second, the need for administrative data is more pressing once the focus is on CIE of Active Labour Market Policy (ALMP), since only administrative data provide a list of unemployed participants and non-participants and their history of employment before treatment, a variable of high importance for dealing with selection bias of

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<sup>1</sup> Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying common provisions on the ERDF, the ESF, the Cohesion Fund, the EAFRD and the EMFF.

<sup>2</sup> The ESF-EEN was managed by the Directorate General (DG) for Employment, Social Affairs and Inclusion and gathered information about the ESF evaluations carried out in the MS. The cut-off date for the information gathered by EEN was December 2013.

participation in ALMP. Third, countries differ in the mind set and capacity available for conducting CIE, data accessibility and legal requirements for obtaining data for research purposes.

Nevertheless, even though the causal statements that can be derived from CIE require more efforts than process evaluation, this effort is justified given that clearer conclusions on policy effectiveness can be drawn.

In view of the limited number of impact evaluations conducted by ESF Managing Authorities (MA), DG EMPL launched in 2013 two calls for proposals 'Pilot Projects to carry out ESF related Counterfactual Impact Evaluations' (VP\_2013\_005 and VP\_2013-015) in order to promote an increased use of CIEs. These calls have given the ESF MA the possibility to evaluate ESF-funded interventions by means of one or more CIE quasi-experimental methods.

This report summarises the results of the eight pilot projects and discusses the lessons learnt in terms of actual results of the CIE analyses conducted, but also in regard to obstacles encountered and success achieved during the implementation of the CIEs.

The remainder of this report is as follows. Section 2 discusses the eight different pilot projects in terms of their aims, data and methods used, main findings, limitations and challenges. Section 3 draws policy conclusions regarding the content as well as the implementation process of CIE during the pilot projects. Section 4 summarises the main results.

## 2 The 2013 calls for proposals on pilot ESF CIEs

The first call for proposals 'Pilot Projects to carry out ESF related Counterfactual Impact Evaluations' (VP/2013/005) was launched in early 2013 and the second one (VP/2013/015<sup>3</sup>) was launched in October 2013.

These calls for proposals offered the applicants a possibility to assess the impacts of ESF funded interventions for the 2007-2013 programming period applying one or more CIE methods.

The objectives of the calls were to raise MA awareness on CIEs, to enhance their capacity to effectively implement CIEs and to provide evidence on the impacts of the evaluated ESF interventions.

Through funding pilot projects, these two calls aimed at generating learning and further testing the ground for the application of counterfactual methods in the ESF areas.

The assessment of the projects was carried out by a panel committee that comprised staff from CRIE and DG EMPL. The final decision was drawn from the members' autonomous evaluation of each project.

Altogether, eight pilot projects were awarded a grant:

1. Post-secondary vocational training courses: are they effective for Italian unemployed youth with a high school diploma? (VP/2013/005/0044) – Country: **Italy**.(cf section 2.1; reference code in Chapter 3: IT1)
2. Evaluation of ESF training interventions for employment in Castile-La Mancha)(VP/2013/005/0033) – Country: **Spain**.(cf section 2.2)
3. Counterfactual Impact Evaluation of Estonian Adult Vocational Training Activity (VP/2013/015/0031) – Country: **Estonia**. (cf section 2.3)
4. Evaluating the employment impact of hiring incentives in Italy (VP/2013/015/0005) – Country: **Italy** (cf section 2.4; reference code in Chapter 3: IT2)
5. Counterfactual Impact Evaluation of ESF-funded Active Labour Market Measures in Lithuania (VP/2013/015/0071) – Country: **Lithuania**. (cf section 2.5)
6. ESF Supporting Youth in Portugal - CIE of Vocational Training and Traineeship' (VP/2013/015/0059) – Country: **Portugal**. (cf section 2.6; reference code in Chapter 3: PT1)
7. ActiValue: Counterfactual impact evaluation of a large activation programme in Portugal. (VP/2013/015/0065) – Country: **Portugal**.(cf section 2.7; reference code in Chapter 3: PT2)
8. Pilot Counterfactual Impact Evaluation of Self-employment and Graduate Practice' (VP/2013/015/0039) – Country: **Slovakia**. (cf section 2.8)

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<sup>3</sup> <http://ec.europa.eu/social/BlobServlet?docId=10970&langId=en>

## **2.1 Post-secondary vocational training courses: are they effective for Italian unemployed youth with a high school diploma?**

### **2.1.1 Intervention evaluated, target population focused on and outcome variables**

The aim of this pilot project was to carry out CIEs of vocational training in five Italian areas, notably: Piemonte, APTrento, Veneto, Lazio and Puglia. Due to issues related with the collection of data, Puglia was not included in the final impact evaluations. The project was implemented by the Italian Ministry of Labour and Social Policies in collaboration with 'Associazione per lo Sviluppo della Valutazione e l'Analisi delle Politiche Pubbliche' (ASVAPP), 'Fondazione Bruno Kessler - Istituto per la Ricerca Valutativa sulle Politiche Pubbliche' (FBK-IRVAPP) and 'Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori' (ISFOL).

Even though some variation between regions existed, the interventions consisted of intensive courses that lasted no less than 250 hours of training. These courses were aimed at the acquisition of specific job skills and thereby improving employment chances of participants.

In all regions, the analysis focused on training programmes attended by 20 to 29 year old high school graduates, who were unemployed at the time of enrolling and registered at regional Public Employment Services (PES). Individuals eligible for vocational training were mainly people with protracted spells of joblessness, who found it difficult to return back to the labour market.

The main outcome variables were employment status, probability of employment with open-ended labour contracts and weeks of work in a year. Policy impacts were measured up to 48 months after the start of training.

In Piemonte, only training concluded in the years 2008-2011 and participants attending no less than 250 hours were considered. The total number of participants who successfully completed the training course was 5057.

The study for APTrento considered training programmes that started in 2010 and 2011 and lasted no less than 300 hours. The total number of participants was 171, of which 158 successfully completed the training course.

The analysis for Veneto took into account training programmes of between 480 to 1,120 hours and having started between 2008 and 2009. The intervention trained 248 people, of which 244 concluded the training course.

In Lazio, the target population consisted of people who attended a training course in the period 2009-2011. The intervention affected 1602 young unemployed over the period 2009-13, but given the focus on a shorter period and difficulties in data linkage, the study eventually considered 585 individuals. In addition, due to lack of data, the outcome of weeks worked was not considered.

### **2.1.2 Data sources**

Data were taken from three administrative archives. In particular, training participation derived from the ESF-MA monitoring system; unemployment status and other individual

characteristics were extracted from PES archive; while outcome variables derived from the 'Comunicazioni Obbligatorie' (COB) archive of the Ministry of Labour and Welfare.

Merging these archives turned out to be particularly problematic for the region of Lazio, both in terms of quality and type of information.

### **2.1.3 Method used**

For all regional CIEs, Propensity Score Matching (PSM) was used.

PSM creates a control group by matching individuals to the treatment group. For every individual in the treatment group (in this case, for every participant in an intervention) another individual is identified in the data who shares the same characteristics except for the one of interest, in this case participation in the intervention. PSM creates a score that summarises all the characteristics used for matching in one single number. Individuals are then matched based on this score. A problem of PSM is that individuals can only be matched on variables for which information is available in the data. Hence, PSM relies on the conditional independence assumption (CIA) which implies that besides the variables controlled for in the design, no other variables impact on selection of individuals into treatment and control groups. While PSM is relatively easy to apply if CIE has not been taken into account during the implementation phase of a policy, PSM needs a data set rich in covariates to meet the CIA assumption.

### **2.1.4 Main findings reported**

Results show that the employment rate of Italian participants increased between 4 to 11 percentage points in Piemonte, APTrento and Veneto, while no employment effects were found in Lazio. However, the impact found is only positive in the long-run, i.e. in Piemonte and APTrento from the 12th month onwards, while in Veneto after the 18th month.

Training programmes seem not to have had any effect on the probability of getting an open-ended contract in APTrento and Veneto, while they negatively influenced the acquisition of permanent contracts in Piemonte and Lazio.

Finally, participants in training were employed on average between 2 to 8 weeks more per year compared to non-participants in Piemonte, APTrento and Veneto.

### **2.1.5 Limitations and challenges encountered**

A major limitation of the analysis derives from the selection of the control group, which is drawn from unemployment registers of the PES. Registration to PES is voluntary and this group is unlikely to be representative of the population of all unemployed people. Therefore results might be biased.

An important challenge of the impact evaluation has been the collection of data for Lazio. A number of problems hamper the validity and conclusions of CIE in this region. For instance, date of registration at PES is missing or incorrectly reported, some employment spells do not report the ending date. As acknowledged by the authors, given these shortcomings, it cannot be ensured that the final selection of individuals is representative for the target group. Moreover, the strategies adopted to deal with these

issues seem to intensify rather than alleviate concerns on the representativeness of the data selection. For instance, as acknowledged by the authors, regarding the COB archive, using the starting date of new employment as an imputation for a missing ending date for previous employment spells is very problematic, since periods of unemployment/inactivity are likely to be wrongly replaced with employment experience.

### **2.1.6 Good practice aspects**

Given the structure of the Italian ESF MA, which includes both national and regional MA, a network had to be created. The network consisted of representatives of the Ministry of Labour and Social Policies, researchers from governmental research institute (ISFOL) and researchers from independent research institutes (ASVAPP, FBK-IRVAPP) which had proven experience in conducting CIE and already had collaborated with MA of Piemonte, APTrento and Veneto. The network was structured in two layers: one at the level of the Ministry coordinating the project, and another at the regional level, the local working group whose core staff is made up of researchers from the above mentioned research bodies.

Besides being pivotal for the success of the pilot project, the involvement of ASVAPP and FBK-IRVAPP has improved the quality of the analysis and made results more trustable.

### **2.1.7 Policy conclusions**

In terms of policy conclusions, and taking into account the above limitations, results suggest that training courses were effective in increasing employability of unemployed people in the long-run in Piemonte, APTrento and Veneto. In addition there is evidence that training also increased the duration of employment spell contract between 2 to 8 weeks, but did not have any or positive effect on the probability of getting an open-ended contract. However, studies for APTrento and Veneto are based on a relative small sample size.

## **2.2 Evaluation of ESF training interventions for employment in Castilla-La Mancha**

### **2.2.1 Intervention evaluated, target population focused on and outcome variables**

The aim of this pilot project was to measure the impact of two training interventions aimed at increasing skills and competencies of unemployed people and their chance to integrate back into the labour market in the autonomous region Castilla-La Mancha. The project was implemented by the regional Ministry of Employment and Economy of Castilla-La Mancha. The two interventions were Operation 2.66.7 'Training actions for unemployed' and Operation 2.66.8 'Professional specialisation workshops'. Both interventions were funded by the ESF OP of Castilla-La Mancha – Convergence objective, under the Priority Axis II 'Strengthen employability, social integration and equality between men and women', category 'Application of measures and preventive measures in the labour market'. The envisaged financial allocation was 6,174,968 Euros for intervention 2.66.7 and 20,488,900 Euros for intervention 2.66.8.

The two interventions differed in the type of training provided. While intervention 2.66.7 offered courses aiming at the acquisition of specific skills, intervention 2.66.8 featured also forms of internship in the public sector.

The interventions were implemented during 2008-2013, a period of global economic downturn. The impact evaluations concentrated on young unemployed people (<25 years old) who concluded a training program in the period 2009-2011. The total number of participants was 15,655 and 252 for intervention 2.66.7 and 2.66.8 respectively. However, the analysis focused on a smaller sample (see section 2.2.2).

The outcome variables were employment rate, number of days worked and number of labour contracts obtained, all measured within 18 months following the start of training.

### **2.2.2 Data sources**

Data were taken from several administrative sources. Information on participants derived from monitoring data held by the MA. Data on the control group were from PES archive, while outcome variables were extracted from the Social Security database. Moreover, information on both treatment and control groups was supplemented by data coming from a survey. However, this information was not used for estimating the impact of the interventions.

From the sample of participants, individuals who were found employed,<sup>4</sup> dropped out or did not participate in the training courses were removed. Moreover, given the interest in young unemployed, more than 70% of participants aged 25 and above were dropped from the sample of participants in intervention 2.66.7.

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<sup>4</sup> It appears intervention 2.66.7 targeted both unemployed and employed people.

### **2.2.3 Method used**

Main results were obtained using PSM. Difference-in-Differences (DID) measures were used for quantifying the impact on employment status 18 months after the start of training, job quality and duration.

### **2.2.4 Main findings reported**

Results indicate that 18 months after the start of training participants in intervention 2.66.7 were 12 percentage points more likely to be in employment, had longer employment duration measured in both days (36 more days) and number of job contracts (0.38 more contracts) and had longer job tenure (22.5 more days). However, these effects must be interpreted with caution since no measure of uncertainty (standard errors) was provided.

As for policy measure 2.66.8, findings suggest a negative impact on all outcome variables considered, albeit in most cases standard errors were not reported so that it is impossible to conclude that differences were statistically significant.

### **2.2.5 Limitations and challenges encountered**

The report does not mention the mechanisms that assign individuals to training. As such, it is likely that selection into the treatment takes place. A good control group demonstrates the counterfactual: how individuals would have performed if they had not taken part in the intervention. Selection bias occurs when the selection of individuals into these two groups is not random, but associated with the outcome variables. If selection bias is not taken into account in the analysis or not entirely addressed, the effect size of the intervention will be biased. (For more details see DG EMPL 2012.)

PSM can solve this only if a very rich set of variables are used. However, the analysis makes use of a limited set of variables that most probably not suffice to exclude the possibility of selection bias. This unfortunately limits the conclusions that can be drawn from the results.

Program participants are unlikely to be representative for the population of young unemployed in Castilla-La Mancha. The analysis focused on young unemployed people (<25 years old) even though this was not the target population of the policy. Furthermore, for both interventions unemployed and employed people were eligible. This is problematic, since if the sample of program participants is not representing the population aimed to be reached by the policy, the results have only a limited value for conclusions on future success of similar programs.

Final results cannot be assessed in terms of statistical significance given that standard errors are not provided. Only if standard errors are displayed, is it possible to conclude that an effect is not due to chance.

The CIE based on intervention 2.66.8 is based on a very small sample size.

### **2.2.6 Good practice aspects**

Cooperation between several MA departments and external consultants proved to be key for identifying available administrative sources and, in particular, to overcome problems related to data access, data collection and selection of variables to be used in the CIE. The network that had been established as a result of this pilot project made it possible to promote a CIE culture and raise awareness of CIE among stakeholders. This is likely to pave the way for more CIEs in the future.

### **2.2.7 Policy conclusions**

Due to the above mentioned limitations, the impact evaluation has only limited value in drawing conclusions on the effectiveness of training measures for increasing labour market performance of participants.

## **2.3 Counterfactual impact evaluation of Estonian adult vocational training**

### **2.3.1 Intervention evaluated, target population focused on and outcome variables**

The aim of this pilot project was to evaluate the impact of the intervention 'Work-related training and development of adult education', implemented by the Ministry of Education and Research (MoER) between January 2009 and June 2014, with a budget of 8.6 million Euros. This was one of the largest ESF supported interventions in Estonia, both in terms of participants and expenditures, during the 2007-2013 ESF programming period.

The aim of this intervention was to facilitate increased participation in lifelong learning and contribute to the labour market competitiveness of the adult population across all Estonian regions, by supporting vocational training interventions in vocational education and professional higher education institutions.

The intervention was targeted at a minimum of 33,000 adults, precisely at the working age adult population across the whole territory of Estonia who had completed compulsory education (having acquired basic education and being over 17 years old).

Over the course of the intervention the main target group changed to tackle the country context of the economic crisis. While initially not considered, unemployed people were allowed to participate, since 1 July 2010. In addition, applicants studying at any vocational, professional or higher education institution at a state-commissioned study place were not any more eligible. Moreover, from 2011 the intervention started to prioritise participants with low qualifications and/or those adult whose qualification had become outdated. Since a large share of participants had a higher education background, it was then decided that they could be included in the intervention in case there were vacancies available.

The analysis focused on evaluating the impact of participation in the courses taking place from the second half of 2010 until the second half of 2011 and in the areas of ICT skills, accommodation and catering, mechanics and metal work, trade and retail, material processing, electronics and automatics, energy and electrical engineering, and building and construction.

During this period the main target group as defined by the MoER were working age adults, who could also be registered as unemployed, who had the compulsory education and were not studying at any vocational, professional or higher education institution at state-commissioned study places.

The outcome variables under scrutiny were annual and average monthly labour market earnings, average number of months employed and being employed at least in one month in 2012 and 2013.

### **2.3.2 Data used**

Different data sources were exploited for this analysis. For the treatment group, a sample of individual level data of participants from the intervention 'Adult Vocational Training and Development Activities' from the second half of 2010 to the first half of 2011 was collected. For the control group, individual level data from the Estonian Survey of Adult Skills (national version of the Programme for the International Assessment of

Adult Competencies (PIAAC)) conducted between 2011 and 2012 were used, including retrospective information on training for the previous 12 months.

Both data sources were merged with individual tax records from the Estonian Tax and Customs Board for 2008–2013, containing information on labour market outcomes like earnings and number of employers.

There were 871 training courses that began between 1 July 2010 and 31 June 2011, of which 461 were part of priority areas. From these, 214 training courses in 31 different training centres with 2,586 participants were selected for the analysis.

The total sample of PIAAC data included 7,632 observations, and was cleaned by excluding observations present also in the treatment group. For consistency with the treated group, also individuals participating in any kind of formal education, during the survey or 12 months before the survey, were excluded from the control group.

### **2.3.3 Method used**

Two CIE methods were used for the analysis: PSM and the combination of PSM with a DID approach.

### **2.3.4 Main findings reported**

Results suggest that adult vocational training had a small positive effect on all outcomes considered, both in terms of earnings and in terms of employability.

However, the results are sensitive to the comparison group and matching technique used. If PSM is used, which assumes that selection bias can be explained by observable variables (the so called CIA), results are significant and show an increase of the employment probability by 6 percentage points and of earnings by 6%. Once the CIA is relaxed using the DID approach, the effects of training are smaller, often statistically insignificant, for employment rates or months of employment. Training still increases earnings by 5% compared to pre-treatment earnings.

### **2.3.5 Limitations and challenges encountered**

In terms of validity of estimated results, the main limitation of the analysis arises from the lack of data on non-beneficiaries. Information on individuals not participating in the intervention was obtained from a second data source (PIAAC). While individuals in PIAAC were randomly selected, individuals in the treated group were self-selected. As a consequence, the use of two different data sources for the treated and control group could undermine the full comparability of individuals especially in terms of unobservable characteristics.

Regarding the implementation of the analysis, the main challenges encountered by the project team relate to the data collection process. Since individual level data on participants was not centrally collected and stored, the project team needed to collect the application forms from each training institution and enter the data manually from the paperback application forms into a single database. The database on participants was therefore entirely constructed by the project staff. This resulted necessarily in a reduction of the targeted population focused on (participants in the courses beginning

July 2010 to June 2011 and belonging to selected priority areas) and in the lack of some important variables that could not be collected at reasonable cost.

In addition, other challenges for the design of the evaluation strategy were encountered because of the unclear intervention logic of the policy and the change of selection criteria and target groups over time.

### **2.3.6 Good practice aspects**

For future CIE the project team proposed the use of two additional data sources: 'Estonian Unemployment Insurance Fund' and 'Estonian National Social Insurance Board', in order to extend the analysis with information regarding the length of unemployment spell, receipt of unemployment benefits, participation in training or other active labour market measures and early retirement pensions and disability pensions. Furthermore, with respect to individual characteristics of participants, the project team also proposed to insert additional questions in the application forms, regarding the occupation and the type of interest for the training courses. This could help to distinguish courses for leisure from work related activities.

During the implementation of the pilot project, Statistics Estonia (to which the data collection of ESF projects was delegated) developed a detailed description of the data collection process for ESF monitoring. As a direct result of this pilot, Estonia decided to digitalise its collection of ESF data in order to facilitate the use of counterfactual methods in the future.

While the civil servants working in analysis departments have a broad understanding of the nature of impact evaluations, the authorities dealing with ESF management often lack the knowledge of how to plan, collect relevant data and conduct CIEs.

To overcome the difficulties encountered in terms of vagueness of the intervention logic of the evaluated measures, as well as the lack of data, the authors state that capacity building on the CIE approach within public authorities is still needed. For this purpose, as a part of this project, both introductory and in-depth training courses on impact evaluations were conducted.

### **2.3.7 Policy conclusions**

Based on the reported results, participation in adult education courses targeted at the entire population has only limited effects on employment probability or earnings of the individuals.

However, since the results are sensitive to estimation method and control group used, the authors state that better background data on participants and comparison group together with follow-up of the participants is needed to ascertain the results, especially in the long-run impacts.

## **2.4 Evaluating the employment impact of hiring incentives in Italy**

### **2.4.1 Intervention evaluated, target population focused on and outcome variables**

The aim of this pilot project implemented by Fondazione Giacomo Brodolini in consortium with Calabria, Marche and Umbria ESF MA was to conduct CIEs of three different ESF-funded interventions using hiring incentives in the three Italian regions. The aim of the hiring incentive programmes was to either increase employment of disadvantaged and disabled workers<sup>5</sup> (Calabria) and to change temporary into permanent contracts (Marche and Umbria). The implementation of these interventions took place during regional high unemployment. Calabria, among the less developed regions in Italy, has been deeply affected by the economic crisis. Marche and Umbria have also strongly felt the effects of the recession.

In Calabria, the incentives were funded by the ESF OP of Calabria - Convergence Objective, under the Priority Axis II 'Employability' (Operational Objective E.1 'Strengthening the occupational hiring and/or re-employment of adult workers, the long-term unemployed, and the members of irregular labour pools through integrated programmes and incentives') and other national and regional resources. The envisaged financial allocation was equal to 30,000,000 Euros. The evaluation regarding the intervention introduced in December 2009 provided 50% of total labour costs (gross wages and social contributions) for 12 months, which was extended to 24 months in case of severely disadvantaged workers and to 75% for a maximum period of 36 months in case of disabled workers. Firms that applied in response to the public notice establishing incentives for employers were considered.

In Marche and Umbria, the policy envisaged incentives for employers who hired through permanent contracts people who previously were contracted through fixed-term contracts.

In Marche, the maximum incentive was equal to 7,000 Euros for full-time employed workers. Employers could also obtain a 30% increase for hiring disabled workers and a 10% increase for employing women or workers aged over 45. The incentives were financed through funds of the Priority Axis II 'Employability' of the ESF OP of Marche Competitiveness Objective, for a total amount of 2,100,000 Euros in 2011 and of 2,800,000 Euros in 2012. Firms applying for the two public calls issued in April 2011 and April 2012 and reaching a minimum selection score of 60 points were eligible and in the focus of the analysis.

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<sup>5</sup> Disadvantaged workers: Those who have not held a regularly paid job for at least six months; those who have not earned an upper secondary-school diploma or a vocational certificate (ISCED [International Standard Classification of Education] Level 3); workers who are over 50 years of age; adults who live alone and who have one or more dependents; workers employed in occupations or sectors characterised by a male/female disparity rate that is at least 25% greater than the average male/female disparity in all economic sectors, if the worker in question is a member of the underrepresented sex; and members of a national minority in Italy who need to consolidate their experience in terms of language skills, vocational training, or occupational training in order to improve their likelihood of obtaining stable employment. Disabled workers: Any workers who are acknowledged to be disabled according to the provisions of Law No. 68/1999, which condition is characterised by confirmed impairments resulting from a physical, mental, or psychological handicap.

In Umbria, the incentive was funded within ESF OP 2007-2013 Umbria Region under the Competitiveness objective, Axis I 'Adaptability', Specific Objective c) (development of policies and services anticipating and managing change, promoting competitiveness and entrepreneurship), for a total amount of 3,300,000 Euros. The evaluation concerns the call that was issued in December 2011 and provided an incentive of 9,000 Euros for each fixed-term contract transferred into an open-ended contract and 6,000 Euros for transforming an apprenticeship contract for employers employing up to nine employees.

For all three regions, population data of eligible firms was used and the evaluations were examined between 2010 and 2013.

The main outcome variables for Calabria were firms' hiring behaviour of disadvantaged and disabled workers and transfers into permanent contracts in Marche and Umbria.

## **2.4.2 Data sources**

Data were collected from three main sources: the regional ESF monitoring systems, the COB dataset (an administrative archive storing all information on contractual changes in regional territories since 2008) and ASIA data (national archive on active firms). Merging did not always work without problems and led to a decline of the actual sample available.

## **2.4.3 Methods used**

For all three regional counterfactual impact evaluations, a combination of PSM and DID was used.

In Umbria and Calabria two sets of results were produced by comparing the treatment group with two control groups. First, in case of firms that had applied but were not funded due to insufficient finances, all applicants constituted the control group. This control group is likely to be very similar to the treatment group and hence less likely to be associated with selection bias. A second control group consisted of similar firms to beneficiary firms among those that did not apply for the incentives. This control group might differ from the treatment group in terms of unobservable characteristics and hence is likely to be subject to selection bias. In Marche, all projects were funded, so that only non-applicant firms could be used as control group.

## **2.4.4 Main findings**

Focusing on results using the control group of similar applicant firms, hiring incentives for disadvantaged and disabled workers had no effect (region Calabria), while incentives for conversions of fixed-term to open-ended contracts was effective to some degree (i.e. around 25% of financed transformations lead to a permanent contract in Umbria) but associated with high costs (being estimated to lie between 30,000 and 40,000 Euros for one conversion of a fixed-term to a permanent contract in Umbria). Impacts were similar across different firm sectors and firms with different numbers of employees.

In the Marche region, results seem to indicate that employers strategically postponed hiring of permanent workers before the second public call took place, thereby anticipating the call, which reduced the overall impact of the intervention.

## 2.4.5 Limitations and challenges encountered

In Calabria and Umbria one control group consisted of eligible firms that applied in time but did not receive treatment since funding had run out. CIE results based on this control group are unlikely to underlie selection bias.<sup>6</sup> This differs from the results provided for Marche where all eligible firms were funded and hence non-eligible firms were used as control group. However, examinations for Calabria using both control group approaches show that about half of the 'effect' found is due to different control groups and hence probably selection bias. Assuming that this result applies also for the region Marche, it can be estimated that between 30 and 40% of the total financed transformation were successful in this region.

In all regions, eligibility depended on an allocated evaluation score of firms' achievement. This score could have opened the opportunity of a more sophisticated counterfactual impact evaluation method (Regression Discontinuity Design (RDD)) than the one applied. However, the score had not a huge discriminating power between applicant firms and data on this score was not available for analysis. This underlines the necessity to take evaluation of policies into account during the design and implementation of the policy.

## 2.4.6 Good practice aspects

The researchers, data holders and policy makers needed to create a network for organising data merging of administrative sources. The project was very successful in doing so. In a meeting among all stakeholders, it was acknowledged that the research was only possible due to established close networks between all involved parties. The network established has the potential of creating spill over effects fostering an impact evaluation culture within the regions that participated.

The project managed to build up capacity on counterfactual impact evaluation exceptionally well through a set of activities and events (like e.g. kick off meeting, meetings during data collection and analysis phase, regional seminars, final seminar for all stakeholders involved and a final conference in Rome). These meetings made the project transparent, provided assurance to data holders of the scope of the project as well as emphasised the need and feasibility of counterfactual impact evaluation for all stakeholders involved.

## 2.4.7 Policy conclusions

Results for Calabria show that incentives for hiring disadvantage and disabled persons do not work. However, this research project is based on a relative small sample of firms.

For Marche and Umbria and in line with existing literature the general conclusions to be drawn is that while the implementation of hiring incentives seems to be working for the transformation of fixed-term to permanent contracts this comes at relatively high costs. In addition, given the risk of firms' anticipation of hiring incentive policies, their implementation should not be possible to be foreseen and not repeated within a short time interval.

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<sup>6</sup> However, if the time to apply is associated with variables not covered in the data set but correlated with the outcome variables of the study, the CIA assumption would not be met.

## **2.5 Counterfactual impact evaluation of ESF-funded active labour market measures in Lithuania**

### **2.5.1 Intervention evaluated, target population focused on and outcome variables**

The aim of this pilot project was to provide robust evidence on the net effects of the major active labour market policies (ALMPs) implemented in Lithuania by the Public Employment Service, i.e. Lithuanian Labour Exchange (LLE), using ESF support allocated under Priority Axis 1 'Quality Employment and Social Inclusion' of the 'Operational Programme for the Development of Human Resources' for the 2007-2013 programming period.

These policies included five projects: 'Employment promotion for the unemployed', 'Promotion of employment opportunities', 'Be active in the labour market', 'Support for employment and mobility' and 'Promotion of youth employment', consisting of two types of interventions, i.e. 'Subsidised employment' and 'Vocational training'.

The selected interventions were granted 106.5 million Euros of ESF support and involved over 70 thousand of unique participants, which accounted for around 5 per cent of the total Lithuanian labour force at the time.

All interventions prioritised the vulnerable groups (e.g. youth, long-term-unemployed, etc.) that faced the greatest difficulties on the labour market. They were targeted at unemployed and aimed at increasing their employability. In particular, the intervention 'Subsidised employment' included two measures addressed to unemployed persons (providing 50% of the salary of employees to the employer over a period of 5 to maximal 12 months) with lower chances to be employed: one measure was the 'employment by subsidizing', aimed at helping unemployed people to enter and stay in the labour market. The second measure was the 'support for the acquisition of professional skills' designed to help the unemployed to obtain relevant skills for the labour market and stay employed. The 'Vocational training' intervention was, instead, implemented in order to help the unemployed (or those at risk of becoming unemployed) to attain or retain employment by providing vocational training courses and thus equipping the participants with relevant competences for the labour market.

The time span covered by the five projects was June 2008 to November 2013.

For the 'Subsidised employment' intervention, persons having severe levels of disability were excluded from the analysis. The evaluation focused therefore on all the remaining disadvantaged groups<sup>7</sup> of unemployed targeted by the intervention. The analysis is done at the individual and not the firm level.

Although the 'Vocational training' intervention was targeted both at the unemployed and people at risk of becoming unemployed, the analysis focused only on unemployed.

The outcome variables under scrutiny were: number of days in registered unemployment per year, number of days in employment per year, total annual gross salary (in Lit) and average daily gross salary (in Lit).

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<sup>7</sup> Disadvantaged groups are defined among others as individuals with moderate disabilities, people in foster care, long term unemployed, individuals over 50, pregnant women, previous drug addicts and political prisoners.

## 2.5.2 Data used

The analysis was based on two merged data sources. LLE provided anonymised data about the treated and non-treated individuals, including various relevant characteristics, such as age, gender, education level, previous unemployment history and assignment to target groups. For the treated individuals, LLE extracted data about all types of ALMP interventions the persons had participated in the period 2004-2013. Secondly, the State Social Insurance Fund Board (Sodra) provided information on employment periods and employment duration of treated and untreated individuals, differentiating between types of employment, as well as earnings received during employment periods.

The merging procedure of the anonymised data from the two sources was conducted by the project team according to random identification codes.

The original data included 74,022 individuals treated in the five funded projects.

The following individuals were excluded:

- Persons who participated in multiple projects or more than once in the same project
- Persons with severe levels of disabilities
- Persons who started, but did not finish vocational training
- Persons notified about their dismissal from the job
- People whose participation start date is earlier or later than start date of the project
- Persons who had missing income values in the dataset

In addition, persons who were absent in LLE or Sodra's data either before or after the ESF projects were excluded. Finally, individuals participating in the project 'Promotion of youth employment', were excluded from the analysis because of lack of data for the post-treatment period (since this project ended in November 2013, data for 2014 were not available).

Therefore, the resulting final treatment group under analysis consisted of 32,572 registered unemployed who worked as employees between 2004 and 2013 and were not self-employed at any time during that period.

For the control group, individuals registered at LLE during the period of 2008–2013, and not participating in the five projects under analysis, were selected. From the 841,050 potential controls the following categories were excluded: persons with disabilities, persons who worked at least once as self-employed workers during the period of interest, persons absent in LLE or Sodra data before or after the project, persons with characteristics - earliest quarter person was registered at LLE during project, education and age - appearing rarely or not at all in the target group.

## 2.5.3 Method used

For the analysis a combination of PSM and DID was used.

## 2.5.4 Main findings reported

According to the estimated results, in the short-run (one year after the intervention), for all projects the 'Subsidised employment' intervention positively affected the labour

market outcomes of participants, both in terms of duration of spells in employment (60 days more) and in terms of higher annual and daily incomes (around 1600 and 3 Litas more, respectively). These effects were slightly smaller but mostly statistically significant in the medium-run (two years after the end of the intervention).

For the 'Vocational training' intervention, the effects on labour market outcomes one year after the end of intervention were negative, implying an increase of the duration of registered unemployment (almost 40 days more) and, accordingly, a reduction of income (around 1300 Litas less per year). The second year after the end of the intervention, the negative effects decreased but remained significant.

The negative effects found might be due to the focus on short and medium effects. The findings are in line with the results of literature on the effectiveness of training, according to which participating in vocational training usually has negative or insignificant effect over the short-term but is likely to result in positive labour market outcomes over the long-term. In the short-run the negative impact can result from lock-in effects of training programmes, which can be explained by lower job search intensity during programme participation. In addition, positive effects in terms of acquisition of skills, enhancement of human capital and consequently an increase in productivity result in the long run.

### **2.5.5 Limitations and challenges encountered**

The design of the policy would have made it possible to exploit RDD using the age of registration as unemployed as cut-off point for participating in the intervention. RDD is a counterfactual impact evaluation method that needs fewer assumptions than the actually employed method of PSM.

Main challenges for conducting this analysis related to the actual framework in Lithuania for granting access to data for evaluation purposes, which is perceived as very much in development.

### **2.5.6 Good practice aspects**

To overcome the important difficulty of gaining access to data, the project team has developed a procedure for requesting and de-personalising data which ensures that personal data does not leave the institutional databases. It has also developed a procedure for merging different institutional sources of administrative data (e.g. data from PES and social security funds) into one data set.

The team stresses therefore the need to develop a framework at the national level in order to foster a more systematic, reliable and faster access to and merge of administrative data sources.

On the other hand, the project team highlights that the possibility to use data for the entire population of the Lithuanian unemployed improved the quality of the matching procedure. It was possible to follow a dynamic design (treated and control units were matched on the base of the actual month/quarter of becoming unemployed, rather than on a static/single moment during the year or with regard to a public intervention).

Finally, the project team stresses the importance of capacity building among the Lithuanian evaluation community by exchanging experiences on CIEs, the need of independence between evaluators and public institutions, and the importance of fostering a CIE culture among policy makers.

The cooperation between institutions in charge of policy making and implementation is in fact perceived as crucial for several aspects, such as understanding the potential mechanisms of transmission of interventions effects, knowing intervention logic and selection criteria and accessing relevant data.

In this regard, the organisation of numerous dissemination events at the beginning, during and after the evaluation, has been the key for establishing networks and a close communication with all stakeholders involved. This has allowed a fruitful discussion first on the technical evaluation design and second on the estimated results in a more general policy perspective.

### **2.5.7 Policy conclusions**

Given the evaluation results, the 'Subsidised employment' intervention positively affects the labour market outcomes of participants in the post intervention period. One year after the intervention employment spells increased by 62 days and incomes by around 1600 Litas annually, with slightly smaller effects in the second year.

On the other hand, in the post intervention spell under analysis, the 'Vocational training' intervention does not show the expected positive results in terms of duration of employment and earnings. The duration of registered unemployment increased by almost 40 days which led to a reduction of income by around 1300 Litas less per year one year after the end of intervention, with slightly smaller effects over the second year after the end of the intervention.

This could possibly be explained with the selection of the group of unemployed and with the focus on short and medium effects (one and two years after the end of the intervention). The related literature on trainings effectiveness indicates in fact that while in the long-run training participation is likely to result in positive labour market outcomes, in the short-run negative impacts may prevail because of lock-in effects, due to the lower job search intensity during programme participation.

## **2.6 ESF supporting youth in Portugal – CIE of vocational training and traineeship**

This pilot project included two separate programmes introduced in Portugal, the evaluation of a traineeship programmes for young unemployed and of the vocational education programmes introduced in upper secondary school. The project was led by the Cohesion and Development Agency, a public organisation that coordinates the Cohesion Policy funds in collaboration with agencies responsible for the implementation of the evaluated programmes. The counterfactual impact analyses were carried out by researchers of the Universities of Oporto and University Institute of Lisbon.

### **2.6.1 Traineeship programme**

#### **2.6.1.1 Intervention evaluated, target population focused on and outcome variables**

The aim of the pilot project was to evaluate a traineeship programme first implemented in 1997 and still currently active. The traineeship programme aimed at facilitating the transition from educational or vocational training into the labour market for young qualified and registered unemployed by offering subsidised traineeships in terms of on-the-job training. The duration of the subsidy was initially limited to 12 months but 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 a Social Support Index (Indexante de Apoios Sociais - IAS). In 2015 the grant is bound to be between 1 and 1.65 of the IAS, which is around 420 Euros. The intervention subsidises a proportion of the grant that is typically 0.8 currently. The rest of the grant is covered by the employer.

Trainee selection is twofold: either the trainees apply directly to employers and then apply for trainee subsidy or the employment office selects participants for training from the pool of eligible unemployed individuals.

The targeted group of the traineeship programme changed slightly over the years, but mainly included registered unemployed aged 30 or younger and individuals with higher education.

The evaluation focused only on individuals who were employed before falling into unemployment from January 2007 until 2012. During this time around 17,000 individuals were subject to the intervention. The outcome variable examined was employment probability up to 36 months following the treatment.

#### **2.6.1.2 Data used**

Three administrative data sets were merged together: i) data on all unemployed individuals who registered at an employment office from January 2004, ii) data on all participants in active labour market programmes from January 2004 onwards and iii) data on all transfers paid and received by all individuals captured in the unemployment register. Data sources i) and ii) were provided by the Employment and Vocational Training Institute, while iii) derived from the Institute for Informatics of Social Security.

The report does not describe the merging and cleaning process of the data and its impact on the exclusion of eligible observations.

The final data set included longitudinal information on employment status and individual characteristics. The same individual was simultaneously counted as treated or control depending on the time window, which is likely to reduce selection bias.

### **2.6.1.3 Method used**

The main CIE method employed was PSM. In particular, a first matching was done with respect to timing of entry into unemployment, while a second matching took place on the probability of treatment using a variety of individual characteristics. Then regression design was used to estimate the effect of participation in the traineeship programme on participants' employment probability.

### **2.6.1.4 Main findings reported**

Traineeships had a severe lock-in effect during first 9 to 12 months of the programme. Thereafter, the programme however significantly raised the employment probability of the treated relatively to the non-treated by 10 to 20 percentage points. The programme seemed to be equally effective for individuals with and without university degree, during periods of high and lower unemployed and in regions with fewer employment opportunities. The effect declined over time but was still significant three years after the start of the programme.

Results only refer to individuals who before falling into unemployment were employed. It cannot be said whether the traineeships had an equally positive effect on individuals who prior to joining the scheme were unemployed.

### **2.6.1.5 Limitations and challenges encountered**

The report does not provide information on the results of the matching procedure so that it is not clear whether control and treatment group were balanced. Matching was based on rich information on employment history which is likely to decrease selection bias.

The higher probability of employment for participants might be partly due to the fact that the control group is in training later than the treatment group and hence experiences lock-in effects later than those treated earlier.

Both of these limitations could lead to an overestimation of the employment effect found which is difficult to quantify.

It is also important to bear in mind that results can only be generalised to those individuals who had experience of employment.

## **2.6.2 Introduction of the vocational education programme**

### **2.6.2.1 Intervention evaluated, target population focused on and outcome variables**

The second part of the pilot project aimed at evaluating a vocational education programme introduced in public upper secondary schools in 2004. This programme running for a period of 18 years introduced a diversified vocational education curriculum thereby offering an alternative to the up to then predominant scientific-humanistic programme. The latter was seen as culprit of Portugal's internationally high upper secondary dropout rates. The aim of the vocational education programme is to reduce early school leaving, to improve the match between skill supply and demand, to expand the possible choices of programmes at the high school level and to facilitate individuals' entrance to the labour market. In 2013, 29% of pupils in public upper secondary schools were enrolled into the vocational track.

The vocational education programme was co-financed by the ESF under three different Operational Programmes in the regions Portuguese mainland, Madeira and Acores. The evaluation focuses on ESF interventions funded in Mainland Portugal. This represents over 97% of the total number of vocational education students in Portugal and over 93% of ESF allocated to vocational education in 2007 to 2013 (1.7 billion Euros).

The target population were 15 to 18 year old individuals with Portuguese nationality, without special educational needs, attending general public schools and being enrolled in lower secondary scientific humanistic programmes in the previous year. The focus was on three cohorts of pupils, corresponding to the academic years of 2008/2009, 2009/2010 and 2010/2011. During this time, almost 32,000 students attended vocational education.

The main outcome variables were transition into the next grade, upper secondary school graduation, dropout and enrolment in higher education.

### **2.6.2.2 Data sources**

Two administrative data sets were used: data including information on students' characteristics, educational trajectories and school context derived from the Ministry of Education and Science. Data on students' labour market positions was obtained from the Information Department of the Ministry of Labour and Social Affairs. The longitudinal data were rich in individual background information.

Merging was done by the public agencies.

While the original data comprised population data for 171,000 individuals in the vocational and scientific-humanistic school track, this was reduced to around 135,000 individuals (79%) once those students with missing information were excluded.

### **2.6.2.3 Methods used**

Coarsened exact matching on a variety of student characteristics was applied. A sensitive analysis also included PSM and alternative coarsening procedures, both methods leading to relatively similar results.

Lack of common support substantially decreased the final sample by about 50 % (from around 135,000 to 67,000 students included in the analysis). The analysed individuals were a selected group having on average higher ability than the population in vocational training.

After matching, the treatment (individuals in vocational programme) and control group (individuals in scientific-humanistic programmes) were not completely balanced in terms of covariates (vocational education students were older and had lower achievement and socio-economic background than scientific-humanistic students).

#### **2.6.2.4 Main findings reported**

Results indicate that vocational education had a positive and statistically significant impact on grade transition and graduation and a negative effect on access to higher education and dropout. The study concludes that the transition from 10th to 11th grade increased by about 20 and from the 11th to the 12th grade by about 30 percentage points for vocational track students. High school graduation increased by 35 percentage points while access to higher education after graduation decreased by 12 percentage points. Results were robust to different matching methods. They indicate that the inclusion of a vocational education curriculum into the existing school curriculum has the potential to improve educational attainment but individuals choosing this track might have lower chances to enrol in university.

#### **2.6.2.5 Limitations and challenges encountered**

One big challenge of this project concerned self-selection of participants into the programme. Individuals who chose to participate in the vocational education programme were very different to those who chose the humanistic curriculum. Any kind of matching procedure however needs to match individuals in the group of vocational with individuals in scientific-humanistic tracks on their background characteristics. This led to two problems. First, individuals could not be matched perfectly: vocational students in the treatment group had on average lower achievement and less educated parents than scientific humanistic students in the control group. As such, selection bias could not be taken into account entirely which can lead to a bias of the results. Second, individuals in the treatment group are on average considerably younger than the average vocational student. This decreases the external validity of the results.

A further challenge of the study was a lack of transparency of the data merging process, which was not conducted by the researchers and as such, not under their control. However, the involvement of the local government services into this project was beneficial, since a network between researchers and the governmental body was established, that can be used for future counterfactual impact evaluations.

#### **2.6.3 Good practice aspects**

The evaluation of both programmes has led to greater awareness of the advantages of counterfactual impact evaluation and their need of planning among MA of OPs. The data analysts predict that this will improve the evaluation process of the current programming period 2014 to 2020 during which six counterfactual impact evaluations are already planned to take place. Three of those regard interventions funded by ESF.

Furthermore, technical staff of public agencies improved their skills on CIE, data providing agencies increased their sense of ownership regarding the project due to their active involvement and confidence building among project partners took place facilitating the exchange of information.

As such, the Portuguese pilot project is an empirical demonstration that it is possible to implement collaborative practices and administrative data sharing among public agencies for policy impact evaluations.

#### **2.6.4 Policy conclusions**

Taking the limitations of the analyses into account, for the traineeship programme, results indicate that independent of the economic cycle traineeship programmes are a useful instrument for increasing employment among individuals who prior to unemployment were employed. After the completion of the traineeship programme, trainees increase their employment probabilities by between 10 to 20 percentage points, with the effect declining over time. This estimate however might be upwards biased given limitations discussed above. The policy is relatively inclusive given that results indicate a significant effect for individuals irrespectively of education, gender and location.

Results of the vocational education programme refer to Portuguese students in regular public schools who did not previously enrol in vocational education programmes. Self-selection into the two school tracks scientific-humanistic and vocational programme is difficult to tackle. Results however indicate that vocational education has a significant and sizable positive impact by increasing grade transition and graduation. However, the vocational programme has a negative impact on probability of enrolment in higher education after graduation.

## **2.7 ActiValuate: Counterfactual impact evaluation of a large activation programme in Portugal**

### **2.7.1 Intervention evaluated, target population focused on and outcome variables**

The aim of this pilot project was to measure the impact of the programme 'Convocatorias', an active labour market policy introduced in Portugal in 2012. The research was conducted by the Queen Mary University of London.

The aim of this programme was to reduce unemployment and facilitate the integration of unemployed into the labour market.

The programme was targeted at two groups of unemployment benefit recipients: individuals aged 45 or above or those who received unemployment benefits for six months or more. In its first year, the intervention involved 240,000 individuals.

People in the target group of the policy needed to participate in meetings in jobcentres. Caseworkers evaluated the specific individual needs which determined further meetings and actions like monitoring job search efforts, direction towards active labour market measures, counselling, traineeships, job subsidies, training or workfare. In addition, if matches were available, unemployed were directed to job interviews. As such, the activation strategies of the policy included a variety of means depending on the individual situation of the unemployed.

It is important for this evaluation, that the policy was implemented during a time of exceptionally high unemployment rate, economic uncertainty and weakened labour demand. During the time frame of the study (February 2012 to February 2013), the quarterly unemployment rate rose from 14.7 to 17.4%. At the same time relatively generous unemployment benefits were at place.

The impact of the policy was measured from February 2012 to February 2013 for those aged 44 or less who received unemployment benefits for 6 months or more (hence, there was no focus on the second policy target group, individuals aged 45 or above). In addition, individuals receiving means-tested unemployment benefits (paid once regular unemployment benefits are exhausted) and unemployed with unemployment benefit duration larger than twelve months were excluded from the analysis.

The outcome variables were: reemployment probability, transition out of unemployment, transitions into non-subsidy unemployment and income level.

### **2.7.2 Data sources**

Two main administrative data sets were used. First, records from the PES included the stock of all individuals registered as unemployed in February 2012 plus the flows of all newly registered unemployed from March 2012 up to March 2013. The data set contained also information on various activities of the jobcentres conducted over that period.

Second, records from the social security data agency included information on the employment status of each individual in each month over the period under analysis, as well as earnings, social security contributions and unemployment benefits registered.

The data were merged to follow individuals as they are unemployed and eventually return to the labour market or are employed and become unemployed and eventually

return to employment. The merged longitudinal data set contained one observation for each individual in each month of the evaluation period.

### **2.7.3 Method used**

The analysis was based on a fuzzy regression discontinuity analysis, exploiting the treatment discontinuity that occurred at the unemployment benefit duration of six months given that the unemployed were only eligible when their unemployment benefit spell hit that threshold. Since not all individuals were eligible at that threshold the RDD was fuzzy.

### **2.7.4 Main findings reported**

Results which were robust to a variety of checks indicated that increased activation efforts delivered by the programme were successful. For those individuals participating in the intervention, the reemployment probability was 8% while for non-participants it was only around 4%. This reflects a doubling of the probability of reemployment for those unemployed subject to the intervention.

The authors concluded that given there were no previous studies investigating the impact of this kind of intervention in times of high unemployment and other studies focusing on better economic conditions finding lower impact of ALMP policies, the results are consistent with the perspective that the effects of the activation are stronger the worse the labour market prospects of the unemployed are.

The gains in employment transitions for the unemployed targeted by the programme could be obtained from fewer transitions among non-eligible unemployed (substitution effects). Using an instrumental variable approach, the study shows that these substitution effects were not in place, thereby confirming furthermore the success of the policy investigated.

While the programme however increased employment chances, it did not have an impact on earnings received. This means that labour market earnings earned by those who leave unemployment are similar to their previous unemployment benefits.

Based on the results found, the authors estimate that the programme had a positive financial impact of 240 million Euros in terms of its target cohort over its first year of operation alone.

### **2.7.5 Limitations and challenges encountered**

Selection bias seems to be contained in the analysis. Estimations of the impact refer only to those individuals with maximal unemployment duration of 12 months and not receiving means-tested benefits.

### **2.7.6 Good practice aspects**

The project has involved the transfer of know-how to the Managing Authority and thereby generated significantly stronger awareness, understanding and importance attached to counterfactual impact evaluations in particular amongst the leading senior managers of POISE (Portuguese Operational Programme of Social Employment and Inclusion). In addition, networks were set up with other agencies including the PES.

### **2.7.7 Policy conclusions**

Focusing on unemployed receiving job related unemployment benefits for maximal 12 months, participation in activation policies like counselling, training and monitoring doubles the average monthly reemployment chances compared to non-participants from 4 to 8%. The programme does not improve individuals' earnings.

This very sizable effect is not due to substitution (that non-participants have lower chances of re-employment). In addition, it is measured during a time of high unemployment. The authors estimate that the intervention had a positive financial impact of 240 million Euros in terms of its target cohort covered over its first year of operation.

## **2.8 The net effects of graduate work experience and the promotion of self-employment in Slovakia**

### **2.8.1 Intervention evaluated, target population focused on and outcome variables**

The aim of this pilot project was to evaluate the effectiveness of two interventions of active labour market policies, implemented by the Central Office of Labour and Social Affairs (COLSaF) and co-financed by the Slovak Republic and the 'Operational Programme of Employment and Social Inclusion' for the programming period 2007-2013.

Both interventions 'Graduate work experience' (51) and 'Self-employment' (49) aimed at improving employability. In particular, 'Graduate work experience' was designed to facilitate obtaining professional skills and practical work experience. It targeted young unemployed jobseekers and consisted of a period of practice of 20 working hours a week with a given employer, with a maximum duration of six months. Personal expenses and the accident insurance were covered by the PES. The budget allocated to this intervention was almost 114 million Euros. It started on the 14 April 2004. The time span covered by the evaluation is 2007-2012, during which the total number of participants was 91,387.

The second intervention, 'Self-employment' was aimed at motivating jobseekers to become self-employed exploiting financial support. It was targeted at jobseekers registered at the PES for at least three months and consisted of a financial grant to start self-employment activities accompanied with training on practical information for their establishment. The budget allocated to this intervention was more than 110 million Euros. It started on 14 April 2004. The time span covered by the evaluation is 2007-2010, during which the total number of participants was 40,136.

This happened in a country context hampered by the economic recession and marked by a critically high unemployment rate (13.4% in the year 2006), lack of vacancies in the labour market and high difficulties for young unskilled jobseekers to enter the labour market.

The target population for the 'Graduate work experience' intervention consisted of all young jobseekers registered at the PES, regardless of whether they continuing vocational training, and regardless of whether they received regular paid employment.

From the 1 January 2007 till the 30 June 2011 (54 months) people aged 25 or lower were eligible, while from the 1 July 2011 till the 30 April 2012 (10 months) also individuals aged 26 were eligible.

Since the 1 January 2007, the target population for the 'Self-employment' intervention consisted of all jobseekers registered for at least three months at the PES and who officially submitted an application in written form.

Between 1 May 2008 and 30 April 2010 eligibility was restricted to jobseekers who attended a specific training programme promoted under the Act of employment services and had carried out a business plan including budget.

The outcome variables evaluated for both interventions were: earnings, self-employment, full-time job, part-time job and placement on the LM. They all were measured two years after the end of the intervention.

## **2.8.2 Data used**

Three data sources were used to carry out this analysis. The first source was the database of jobseekers maintained by the COLSaF and supported by the regional PES offices. This database contained information for the identification of treated and non-treated individuals, information about the eligibility of jobseekers, time period of treatment, amount of grant and intervention characteristics.

The second data source was provided by the Social Insurance Agency (SIA). It contained data for the measurement of employability and performance of jobseekers after the intervention, like monthly earnings of enrolled and non-enrolled jobseekers in the intervention, information regarding the nature of the employment, basic identification of the employer in terms of its regional affiliation, or membership of a section or group of economic activities.

Finally, data provided by the Statistical Office of the Slovak Republic were used to describe regional and national contexts in the labour market with regard to employability conditions and employment rates disaggregated by gender, age, level of education and district.

Further data provided by the University of Zilina were used to measure individual distance from the municipality of permanent residence to the regional PES office.

Data from COLSaF and SIA were merged by personal identification numbers of all jobseekers registered in the CoLSAF database from 1/01/2007 to 30/04/2012, for a total of 2,886,510 records.

For the 'Graduate work experience' intervention, the group of treated individuals from the 1 January 2007 till the 30 April 2012 consisted of 91,387 jobseekers.

For the 'Self-employment' intervention, the number of treated jobseekers from the 1 January 2007 till the 30 April 2012 equalled 40,136.

A cleaning procedure was applied to exclude treated units with missing values on individual characteristics.

## **2.8.3 Method used**

Exact matching and PSM were used for the analysis.

## **2.8.4 Main findings reported**

Both interventions increased the employment rate by fostering the entry in the labour market of young seekers and self-employment activities. However, the results of the current analysis should be further investigated with an updated evaluation using CIE methods, in order to assess the effectiveness of the interventions in the long term.

## **2.8.5 Limitations and challenges encountered**

This project represented the first experience of counterfactual evaluation for the research team in a country where a culture of CIE is still developing.

Several problems were related to the process of selection of treated and control individuals. Furthermore, the CIE methods possibly magnify this selection issue, possibly leading to biased findings. Other limitations originated from the matching procedure used for the analysis (exact matching and matching with replacement only). This resulted in a very small size of the sample of treated individuals under analysis, thus hampering the validity of results.

As highlighted by the authors, the lack of data often prevented the implementation of impact evaluation in Slovakia or undermined the validity of results. In this case, big efforts had been made to access a large quantity of information by collecting data from three data sources. The process of access and collection of data implemented to overcome this problem required a long time and delayed different phases of the work plan. In particular, many complications arose because of the lack of relevant variables, such as identification number of self-employed, nomenclature of economic activities (NACE) sector for economic activity for control individuals and because of the high incidence of missing values.

Further difficulties originated from the fact that the dataset made available to the project team was not appropriately cleaned and ready to use.

## **2.8.6 Good practice aspects**

Big efforts were made to access a large quantity of information by collecting data from three data sources, in order to overcome the scarcity of data for evaluation purposes in the country.

The authors stressed that data collection and accessibility should be improved in order to facilitate the implementation of impact evaluation. In particular, the creation of direct linkages between COLSaF and SIA database, and a uniform procedure for data recording were recommended.

## **2.8.7 Policy conclusions**

Due to the above mentioned limitations, the impact evaluation has only limited value in drawing conclusions on the effectiveness of the analysed interventions.

**Table 1: Summary of Pilots**

<b>Title of the project</b>	<b>Interventions evaluated</b>	<b>Data used</b>	<b>Target population</b>	<b>Time interval of evaluation</b>	<b>CIE method used</b>	<b>Outcome of interest</b>	<b>Main limitations</b>	<b>Results reported</b>	<b>Lessons learnt</b>
Post-secondary vocational training courses: are they effective for <b>Italian</b> unemployed youth with a high school diploma?	Training programme for unemployed high school graduates in regions: Piemonte, Autonomous Province of Trento, Veneto, Lazio	ESF monitoring data, Public Employment Service (PES) archive, Comunicazioni Obbligatorie archive	20 to 29 year old unemployed high school graduates in unemployment	Piemonte 2008-2011; APTrento 2010-2011; Veneto 2008-2009; Lazio 2009-2011	Propensity score matching (PSM)	Employment rate; employment rate of open-ended contract; employment length	Control group may not be representative of the population of unemployed people. Results therefore might not be valid for all unemployed.  Poor quality data for Lazio.	Long-run employment rate for participants increased by about 4-11 pp in three out of four regions (Piemonte, APTrento, Veneto).  Participants also worked between 2 to 8 weeks more per year after 12 months in APTrento and Veneto, and after 24 months in Piemonte.  No effect (APTrento, Veneto) or negative effect (Lazio, Piemonte) on the probability of having an open-ended contract.	Data linkage from different administrative sources was essential for conducting the CIE. The involvement of independent research institutes with proven experience in the field of CIE (i.e., FBK-IRVAPP and ASVAPP) helped improve trustworthiness of results.  Training increased employment rates
Evaluation of ESF training interventions for employment in <b>Castilla-La Mancha</b>	Two training interventions for unemployed people in Castilla-La Mancha	ESF monitoring data, PES archive, Social Security archive	Unemployed aged 24 or below	2009-2011	PSM and Difference-in-Differences (DID)	Employment rate; days of work; number of labour contracts obtained	The target population is not clear which makes generalisations of results problematic. Selection bias	Results indicate that participants in intervention OP 2.66.7 were about 12 pp more likely to be in employment, had longer	Cooperation between several MA departments and external consultants proved to be key for identifying available

Title of the project	Interventions evaluated	Data used	Target population	Time interval of evaluation	CIE method used	Outcome of interest	Main limitations	Results reported	Lessons learnt
(Spain)							is likely to be at place leading to a bias of the estimated effect size. Limited sample size for OP 2.66.8 which makes it more difficult to find significant effects.	employment duration measured in both days and number of job contracts, and had longer job tenure 18 months after the start of training. No effect or negative effects of the policy measure OP 2.66.8	administrative sources and, in particular to overcome problems related to data access, data collection and selection of variables to be used in the CIE.
Counterfactual Impact Evaluation of Estonian Adult Vocational Training Activity	Programme 'Work-related training and development of adult education'	Data set created from training records merged with secondary survey data (PIAAC)	Working age adult population in entire Estonia not subject to compulsory education and not in education	2012, 2013 for courses taking place from the second half of 2010 until the second half of 2011	PSM and PSM + DID	Annual earnings; average monthly earnings; average number of months employed; probability of being employed at least in one month	Information on individuals not participating in the intervention was obtained from a different data source (PIAAC) than that for participants. This reduces the comparability of treated and control units. As such, selection bias could be at place biasing the results.	Based on PSM results, which are more likely to be subject to selection bias, adult vocational training had a significant positive effect on all outcomes considered, both in terms of employability and in terms of earnings increase (around 6%).  The combination of PSM and DID yields smaller, often statistically insignificant effects for employment	Since the reported findings are sensitive to estimation method and comparison group used, better background data on participants and comparison group together with follow-up of the participants is needed to ascertain the results, especially the long-run impacts.  Regarding the feasibility of CIE, the processes of data collection and access need to be

Title of the project	Interventions evaluated	Data used	Target population	Time interval of evaluation	CIE method used	Outcome of interest	Main limitations	Results reported	Lessons learnt
								rates and months of employment. The estimated effects on earnings are significant and positive (around 5% increase compared to pre-treatment earnings).	improved. For this aim, and in order to define clearly intervention logic and target groups, capacity building on the CIE approach within public authorities is still needed.
Evaluating the employment impact of hiring incentives in <b>Italy</b>	Hiring incentives for disadvantaged and disabled (Calabria) and transformation of fixed-term into permanent contracts (Umbria and Marche)	Regional ESF monitoring data, Comunicazioni Obbligatorie data (administrative data set) and national archive on active firms	Firms that were eligible for the incentives due to their response to the public calls before budget limitations were hit.	Between 2010 and 2013	PSM, a variety of matching methods were used to check robustness of results	Number of hiring of disabled; number of contract transformations	Selection of control group difficult, especially in the region Marche. This could lead to selection bias associated with a bias of the estimated effect size.	Hiring incentives for disadvantaged and disabled were not successful. Incentives for transforming fixed-term into permanent contracts was effective for about 25% of contracts in Umbria but associated with high costs.	Incentives for transforming fixed-term into permanent contracts are costly, only partly effective and should not be possible to be anticipated by firms.  Networks as well as capacity on CIE were built up among stakeholders due to a high variety of dissemination events.
Counterfactual Impact Evaluation of ESF-funded	5 projects on ALMP including 'Subsidised employment'	Two administrative data sources on individual	Unemployed and unemployed disadvantaged	One and two years after the end of the projects, which	PSM + DID	Number of days in registered unemployment	Selection of the sample of treated individuals	The 'Subsidised employment' intervention improves the	The introduction of the 'Subsidised employment' positively affected

<b>Title of the project</b>	<b>Interventions evaluated</b>	<b>Data used</b>	<b>Target population</b>	<b>Time interval of evaluation</b>	<b>CIE method used</b>	<b>Outcome of interest</b>	<b>Main limitations</b>	<b>Results reported</b>	<b>Lessons learnt</b>
Active Labour Market Measures in <b>Lithuania</b>	and 'Vocational training' interventions	characteristics and labour market outcomes, as employment periods, employment duration, earnings	individuals	took place from June 2008 to November 2013.		per year; number of days in employment per year; total yearly gross earnings (in Litas); average daily gross earnings (in Litas)	under analysis might limit the external validity of the results.	duration of spells in employment (around 60 days more) and earnings in all projects (around 1600 Litas per year) one year after the intervention.  In contrast, the 'Vocational training' intervention yields negative effects, implying an increase of the duration of registered unemployment (almost 40 days more) and a reduction of earnings (around 1300 Litas less per year) one year after the intervention. Effects are slightly smaller two years after the intervention.	the labour market outcomes of participants, while in the short and medium run the effects of 'Vocational training' are negative.  Networking taking place among all stakeholders, policy makers and civil servants, and the organisation of numerous dissemination events strongly contributed to build up confidence in CIEs.  Cooperation with public agencies was very helpful also in terms of access to data.
ESF Supporting youth in <b>Portugal</b> : Traineeship and Vocational	Traineeship programme offered to young registered unemployed to facilitate	Three administrative data sets on individuals characteristics, labour market	Individuals who were employed before falling into unemployment from January	From 2007 to 2013.	Matching and regression analysis.	Employment probability for up to three years after the start of intervention.	Coverage of target population not completely clear which makes it difficult to	Traineeship programme increases employment probability by 10 to 20 percentage points for	The traineeship programme increases employment of those previously employed and is

<b>Title of the project</b>	<b>Interventions evaluated</b>	<b>Data used</b>	<b>Target population</b>	<b>Time interval of evaluation</b>	<b>CIE method used</b>	<b>Outcome of interest</b>	<b>Main limitations</b>	<b>Results reported</b>	<b>Lessons learnt</b>
Training	transition into labour market  Vocational education intervention introduced in public high-schools in 2004	outcomes  Two administrative data sets comprising information on individuals' characteristics, educational trajectories and school context.	2007 onwards.  15 to 18 year old Portuguese originating from scientific humanistic programmes and being enrolled in the first year of a public upper secondary school (10 <sup>th</sup> grade).				generalise results found. Selection of control group difficult which might lead to a bias of the estimates.  Problem of matching vocational education students with students in scientific humanistic education. Selective population used for estimation. As a consequence, the effect size could be biased	previously employed. The intervention was effective independent of gender, economic cycle, education and region but declines over time.  The introduction of vocational education increases the probability of grade progression by 20 to 30 percentage points and graduation by 35 percentage points. However, being enrolled in vocational education reduces tertiary education enrolment by 12 percentage points.	inclusive.  The introduction of a vocational upper secondary school track had a significant impact by increasing vocational students' grade transition and graduation probability.  Collaborative practices on CIE and data management were introduced leading to greater awareness of CIE among all stakeholders and currently six future CIEs in planning.
ActiValue: Counterfactual impact evaluation of a large activation	Convocatorias: unemployment benefit recipients aged 45 or those for 6 or more	2 merged longitudinal administrative data sources (Social security data	Individuals aged 44 or less who are experience unemployment benefit	February 2012 to February 2013	Fuzzy Regression Discontinuity Design (RDD)	Transition into employment,  Income	Nothing can be said on the impact of the intervention on long-term unemployed,	Targeted individuals have around twice as high a probability of transition to	The study's target individuals participating in the intervention double their monthly

<b>Title of the project</b>	<b>Interventions evaluated</b>	<b>Data used</b>	<b>Target population</b>	<b>Time interval of evaluation</b>	<b>CIE method used</b>	<b>Outcome of interest</b>	<b>Main limitations</b>	<b>Results reported</b>	<b>Lessons learnt</b>
programme in <b>Portugal</b>	month receiving benefits participate in meetings in jobcentres and take part in actions evaluated to be suitable for them by caseworker	and PES)	duration of 6 months (up to 12 months). No means-tested benefits included.				individuals aged 45 and over and individuals on means-tested benefits, since they were not focus of the study.	employment than the control group, but the intervention does not improve income.  Effects found are not due to declined employment probabilities of non-eligible unemployed (substitution).  Effect of activation intervention is strong in unfavorable labour market setting.	employment probability from 4 to 8%. The intervention has however no impact on income.  Activation works during high unemployment.  The project created considerable transfer in know how to Managing Authorities.
The net effects of graduate work experience and the promotion of self-employment in the <b>Slovak Republic</b>	Two interventions: 'Graduate work experience', for enhancing the acquisition of skills and 'Self-employment', for supporting the creation of businesses.	Three administrative data sources on individual characteristics, labour market outcomes and regional and national contexts of labour markets	'Graduate work experience': young jobseekers (<26) registered in the database of the Public Employment Service office.  'Self-employment': jobseekers registered for at least three	Two years after the end of the interventions, whose implementation framework was:  'Graduate work experience' January 2007 to April 2012;  'Self-employment' January 2007 to	Exact matching and PSM.	Earnings; self-employment; full-time job; individual barriers for entrance in the labour market; placement on the labour market.	Several challenges related to data availability and collection and to the first experience of implementing CIE.  CIE methods used did not duly address selection issues; this led to biased findings.	Both interventions fostered the entry in the labour market of young seekers and unemployed willing to start self-employment activities.	Regarding CIE feasibility, big efforts had been made to access a large quantity of information by collecting data from three data sources. The creation of direct linkages between the data sources of COLSaF and SIA, and a uniform procedure for data recording, have been

<b>Title of the project</b>	<b>Interventions evaluated</b>	<b>Data used</b>	<b>Target population</b>	<b>Time interval of evaluation</b>	<b>CIE method used</b>	<b>Outcome of interest</b>	<b>Main limitations</b>	<b>Results reported</b>	<b>Lessons learnt</b>
			months in the database of PES, who officially submitted an application in written form.	April 2010.			The validity of results is also hampered by the very small sample size of the matched treated.		recommended.

### 3 Lessons learnt and results

Given the presented pilot projects' reports, two major strands of conclusions emerge:

- First, many pilot projects report on the process and implementation of the CIE, like for example networks developed and data access. Are there common lessons to be drawn from this? This will be discussed in 3.1.
- Second, it is of interest to summarise the conclusions based on the actual results of the counterfactual impact evaluations conducted. What policies worked given the results of the pilots? This will be discussed in section 3.2.

#### 3.1 Lessons learnt from the implementation of pilot CIEs

Three main conclusions can be drawn from the implementation of the pilot projects.

##### 3.1.1 Establishing networks and developing capacity building are crucial for the success of a CIE

Pilot project reports for Italy (IT1, IT2), Lithuania and Portugal (PT1) discuss the importance of and success in establishing networks between different stakeholders, like ESF MA, civil servants, data holders of administrative data on labour market issues and the research contractors or analysts in order to make the evaluation possible. As discussed predominantly in the Italian (IT1) and Lithuanian pilot reports, the key for establishing these networks seems to have been the organisation of numerous dissemination events at the beginning (kick-off meeting), during and after the evaluation for all the stakeholders involved.

Researchers as well as other stakeholders benefit greatly from networks on CIE, as is highlighted in many of the reports. In the ideal case, researchers inform the other stakeholders of data requirements to conduct the research. However, this is generally not a straightforward process since data might not be stored in the way needed or information required might not be available (see below). In addition, since there are generally legal limitations of obtaining data, the cooperation of public agencies holding the data is needed. As such, having built up trust with different stakeholders during the pilot projects will help facilitate data access in the future.

In addition, evaluators need to be informed about the intervention logic of the measures being evaluated by the public agencies organising the evaluation. For example, the Estonian project discusses that the policy of adult training lacked such an intervention-logic: the main aim of the policy was to increase adult training without aspiring any other causal effects, like for example improvement of labour market chances of trainees. If an intervention lacks an intervention-logic and therefore does not formulate a clear desired outcome, it is difficult to determine and measure its possible impact.

The networking with policy makers also helped understanding processes and obstacles of the implementation of the policy which were not set in writing in any legal or policy report. For example, in Estonia, Italy (IT2) and Slovakia the selection into the group of programme beneficiaries was based on specific criteria which were only known by the training agency or job search office. The criteria for selecting into treatment are key for

CIE, since the control group needs to be matched to these criteria. As such, communication with the agency implementing the policy is of high importance.

However, networking is not only beneficial for researchers in terms of gathering the right information needed for a high quality CIE, but also for other stakeholders involved.

Reports of the Lithuanian, Spanish and both Italian pilot projects mention that policy makers and civil servants got exposed to and built up awareness, confidence and capacity in CIEs as a direct result to close communication and meetings between stakeholders. Given that CIE results could be regarded as sensitive, this is a major achievement which could lead to spill over effects of further conduction of CIE in the future.

Communication at different stages of the implementation of pilots helped to build mutual trust among stakeholders in the research process and as such, in the results generated. The provision of the funding of these pilots by DG EMPL has provided an additional positive impulse for the use of counterfactual-based evaluations for stakeholders within the network of different pilot projects.

In sum, evaluators conducting the pilot projects necessarily needed to establish networks between stakeholders which was of vital importance for the quality of their CIE in terms of information and data access. In addition, other stakeholders like MA, civil servants and data holders experienced awareness and capacity building in CIE within the framework of networking.

The now existing networks and awareness in CIEs among stakeholders are likely to lead to further support of CIE and spill over effects for future collaboration on CIE. This is indeed already the case in Portugal, where currently six CIE are planned for the future.

### **3.1.2 Expertise of data analysts varied among the countries that implemented the pilot CIEs**

Capacity building on CIE methods among all stakeholders was most successful in those countries where data analysers were highly experienced in CIE.

However, there were considerable country differences in terms of existing knowledge of CIE methods. Pilot projects' external contractors had varying expertise in using CIE, ranging from one external contractor being a well-known academic within this research field to another contractor just gathering first experiences of conducting CIE.

However, lack of experience and knowledge decreased sometimes the quality of the analysis and the communication of results within the report.

One possible reason for a lack of expertise of analysts might be due to limited knowledge of CIE methods in a country's academic community, making it therefore difficult to outsource CIE of ESF funded interventions.

A possible solution to this problem could be to facilitate the process of outsourcing CIE of interventions by creating a single European wide access points for calls of CIE studies (written in English language) on ESF interventions. Such an access point would provide transparency about available calls and with that improve allocation of experts into those countries with limited knowledge on CIE. For the next year, CRIE is planning to set up this European wide access point.

### 3.1.3 Data creation and provision are at the core of a successful CIE

Analysts experienced different access to administrative data due to countries' varying legal limitations set for data distribution, how administrative data are stored and previous experience in exploiting administrative data for analyses of this kind.

#### Data merging

For the majority of pilot projects, the biggest challenge regarded the creation of a data set on the control group. The choice of the control group is vital in order to be able to compare results and reduce selection bias. Since labour market research generally uses administrative data which is predominantly only collected for policy beneficiaries, data on a possible control group needed to be received from a different administrative data source. Varied solutions were chosen. The ideal approach was to use administrative data covering variables on labour market outcome for the entire working age population and merging this with an administrative data set including identifiers on those who participated i.e. in training (Lithuania, Portugal (PT1), Italy (IT1)). In these cases, external validity was high if the data quality was good and merging was unproblematic.

However, receiving this ideal data set was generally related to a number of challenges. First, data merging was out of the control of the data analysts. As such information on the data quality (linkage errors) was not available. The impact of possible linkage error on the results could therefore not be estimated. (It needs to be acknowledged that the topic of linkage error and its impact on results is a relatively new academic research field gaining only importance with the increasing interest of exploiting administrative data for research purposes.) Related to that, second, the received merged data files were subject to a high number of missing values. As a consequence, individuals with missing information could not be taken into account for the analysis, thereby jeopardizing external validity. Third, a number of data analysts report considerable delay in data provision which led to time pressure for conducting the analysis.

A possible solution to the problem of data merging experienced in a variety of countries is to create a national centre responsible for administrative data linkage and delivery (as in place already in some European countries). Such a centre would also need to provide information on data quality (like for example linkage error) that needs to be provided together with the linked data sets to the data analysts.

#### The necessity to plan CIE during the policy implementation in order to improve data quality

Some projects had major difficulties in data access. For example in Estonia, data on intervention participants were not collected and stored, so that it was impossible to trace participants back to national administrative data. Data analysts therefore created data based on pen and paper records of participants. These data was compared to survey data on non-participants. Since two different data sources were used for control and treatment group, the comparability of data could be questioned.

In the Italian project on hiring incentives (IT2), the focus was on firms. Eligible firms that did not receive funding since it had run out were used as a control group, which was a good choice as long as firms that applied later did not differ significantly to those applying earlier. However, in region Marche all firms eligible received treatment, so that it was difficult to create a good control group.

In the Portuguese pilot focusing on vocational training in the school curriculum (PT1), a control group could not easily be created given that students in different school tracks differed greatly in their background characteristics making it rather impossible to receive a good matching result while keeping the groups selected representative for the population.

The eight pilot CIEs were not planned in advance as they were the result of a one off exercise launched by DG EMPL. In order to avoid problems with data access, the solution for ESF Managing Authorities is to reflect on data requirements for the evaluation of a policy already before its implementation.

## **3.2 Research results of pilot projects using counterfactual impact evaluation**

Policy conclusions to be drawn from the research results found by the eight pilot projects can be divided into two subject areas: those pilot projects that examined training programmes (section 3.2.1) and those focusing on more general active labour market policies (section 3.2.2).

### **3.2.1 Training programmes**

The Italian, the Spanish, Estonian, Portuguese and Slovak pilot projects as well as one part of the Lithuanian project examined different vocational training programmes. The training interventions investigated differed in terms of training intensity, their links to labour market needs, the study population in focus and the design of training programme which is likely to impact on the training effects found.

Four of those pilots (Italy (IT1), Spain, Portugal (PT1) and Slovakia) investigated policies that target the young unemployed (the definition of 'young' differed between projects). While conclusions for Slovakia are not straightforward, the other three projects demonstrate that training generally increases the employment rate and the number of weeks worked per year. For example, in Italy about one year after the start of training, employment rate for participants increased by about 4 to 11 percentage points in Piemonte, APTrento and Veneto. Participants also worked between 2 to 8 weeks more per year after 12 months in APTrento and Veneto, and after 24 months in Piemonte. In Portugal, 2 years after treatment, the employment probability of Portuguese trainees was still by more than 10 percentage points higher than that of intervention non-participants.

As the Portuguese project discusses, the intervention effect can be found for all unemployed whether they differ in gender, education or region. The Italian pilot on training intervention however shows that some socio-demographic groups are more likely to be influenced by training. In particular, the policy impact in Piemonte appears higher for 18-20 years old and immigrants with respect to both employment rate (up to 7-10 percentage points increase) and employment duration (up to 4 weeks increase). The analysis for the region Veneto suggests instead a stronger impact on women and people aged 23 and older. The Spanish pilot concludes in addition that the training increases the job duration while the Italian project does not find any impact of the training on achieving permanent contracts.

In contrast to the other projects, the Lithuanian project focuses on a variety of unemployed including disabled, long-term unemployed and the elderly. Results are contrary to those of the other countries: training prolongs unemployment and leads to a decrease in income. This could possibly be explained by the choice of study population. As such, these pilots contribute to existing literature, which generally highlights that training for unemployed improve labour market chances (Bratu et al. 2014, Kluge 2010).

The Estonian pilot examines a training policy aiming at improving skills of the entire adult workforce. If PSM is combined with differences-in-differences, generally no significant effect of training on employment can be found, but slightly higher earnings.

The Portuguese project on vocational training within secondary schooling suggests that the introduction of vocational training into a previously more theoretically based upper secondary education system improves pupils' grade progression but reduces tertiary education enrolment.

In sum, with the exception of the Lithuanian project generally the introduction of vocational programmes in the school curriculum and the use of training programmes for the unemployed seems to facilitate the learning experience and improve labour market chances.

### **3.3.2 Active labour market policies**

The Lithuanian and Italian (IT2) pilot projects both examined whether subsidising the employment costs of individuals impacts on their labour market chances. Based on firm data, the Italian project concludes that hiring incentives for disabled workers do not lead to better employment chances, while hiring incentives for transforming fixed-term into permanent contracts have some effect (with 25 percent of contracts being transformed due to the intervention) even though this is associated with high costs and might reflect some substitution effects. If employers anticipate the implementation of such a policy, they might postpone the transformation of contracts to the time the policy is set in place, thereby undermining the aim of the policy.

In Lithuania, policies of subsidised employment seem to increase substantially the duration of employment (around 60 days) and enforce better earnings (around 1600 Litas per year). These results seem in line with the existing literature which indicates that employment subsidies are effective in increasing employment probabilities both in the short- and long-run (Caliendo and Künn 2011, Forslund et al. 2004, Sianesi 2008).

The Portuguese pilot (PT2) focuses on the activation programme 'Convocatorias', which entailed, among others, close job monitoring of eligible unemployed. Results indicate that the probability of transition into employment doubled from 4 to 8 percentage points for those unemployed participating compared to non-participating individuals equal in all but intervention participation. A policy effect on earnings however could not be shown. The effect was investigated during extremely high unemployment, indicating that activation policies can very well yield important effects during unfavourable labour market settings. The authors estimated the programme had a positive financial impact of 240 million euro over the first year of operation.

## 4 Main conclusions

This report summarised the results of eight pilot CIEs funded by DG EMPL. The main conclusions are the following:

### **Establishing networks and developing capacity building are crucial for the success of a CIE**

Networks created in the framework of the implementation of the eight pilot projects facilitate the development of a CIE culture within countries by creating trust, confidence and capacity in CIE methods among all stakeholders. The Italian, Spanish, Lithuanian and Portuguese Projects stress the importance of building up networks between different stakeholders (i.e.: civil servants, data holders, evaluators and policy makers) to make the research possible.

In addition, networks enable investigating data availability, assuring goodwill of data holders given legal limitations for data delivery and getting access to unrecorded information important for CIE design (i.e. intervention logic and selection criteria of beneficiaries). In Portugal networks and capacity established during the execution of ESF pilot projects contributed to the current planning of several future CIEs. This spill-over effect of networks now established was also experienced in other pilot project countries.

### **Expertise in CIE varied among the countries that implemented the pilot CIEs**

The analysts conducting the Pilot project had a varying initial level of expertise in using CIE, which might be due to differing acquaintance with CIE methods in the countries involved. The creation of a single European wide access point for calls for tender of CIE studies, as CRIE plans to create during 2016, could help make accessible the available expertise in Europe throughout all Member States.

### **Data creation and provision are at the core of a successful CIE**

The main challenge encountered to carry out CIE analysis was the availability and access to a suitable data set on the control group. The feasibility of merging administrative data often held by different agencies in order to obtain information on policy beneficiaries and non-beneficiaries was subject to countries' and regions' data protection laws and previous experience with administrative data linkage. Generally, data merging and with that, the quality control of data, was not in the hands of the evaluator.

In most cases however, better planning and improved data quality would have increased the quality of evaluation. Since CIE were not accounted for in the design phase of the policy, most of the pilot projects had to use Propensity Score Matching (PSM) as evaluation method, instead of other CIE methods that do not require strong assumptions difficult to meet in reality.

Solutions for the future are the following:

1. Data needs for CIE should be taken into account already at the beginning of the design of the policy to be evaluated.
2. The problems of merging different administrative data sets stored by different data agencies could be solved by the creation of a national centre responsible for administrative data linkage and delivery (as in place already in some European countries).
3. If data merging is not conducted by evaluators, information on data quality (like for example linkage errors) should be provided by the agency merging the data.

## **The results of the pilot CIEs enriched the knowledge base on the effectiveness of some ESF interventions**

The Spanish, Estonian, Slovak, a part of the Lithuanian and Italian and Portuguese pilot projects examined different **vocational training programmes**.

The Italian, Spanish and Portuguese projects focused on young unemployed. They concluded that training for the young generally increased their employability as well as the number of weeks worked per year. For example, the employment rate of Italian participants increased between 4 to 11 percentage points in Piemonte, APTrento and Veneto. and participants worked between 2 to 8 weeks more per year after 12 months in APTrento and Veneto, and after 24 months in Piemonte. In the Portuguese evaluation, traineeships were found to increase the probability of employment between 10 to 20 percentage points irrespective of their gender, education and location. However, the Italian pilot on training intervention shows that some socio-demographic groups are more likely to be influenced by training.

Once the focus is on training provided for the entire workforce, the policies evaluated in the Estonian and Lithuanian pilots generally did not yield any significant causal effect on labour market chances or even prolonged unemployment and decreased earnings.

The Portuguese project focusing on pupils in upper secondary school concluded that the introduction of vocational training into the school curriculum increased educational attainment and decreased school dropout but lowered the chances to enrol in university.

The Lithuanian and the Italian and Portuguese pilots investigated **active labour market policies** in a broader sense.

The Italian and Lithuanian pilot projects focusing on hiring incentives concluded that these policies increased the duration of employment. However, this was at high costs. In addition, for one Italian region substitution effects were at place since employers seemed to adapt behaviour in anticipation of a policy implementation.

The Portuguese project examined the causal effect of the 'Convocatorias' activation scheme. Unemployed were closely monitored and subject to a variety of possible training and employment actions. The probability of transition into employment doubled from 4% to 8% for those unemployed participating in the intervention compared to similar non-participants. The authors estimated the programme had a positive financial impact of 240 million euro over the first year of operation.

## References

Bratu, Cristina, Lombardi Stefano, Margarida Rodrigues, Santangelo Giulia, Shaleva Anna, 2014. Knowledge gaps in evaluating labour market and social inclusion policies. Use of counterfactual impact evaluation, JRC Science and Policy Reports EUR 27287, European Commission Joint Research Centre.

Caliendo, Marco and Künn, Steffen, 2011. Start-up subsidies for the unemployed: Long-term evidence and effect heterogeneity, *Journal of Public Economics*, 95(3-4): 311-331.

DG Employment, Social Affairs and Inclusion, 2012. Design and commissioning of counterfactual impact evaluations.

<http://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=7646>

Forslund, Anders, Johansson, Per and Lindqvist, Linus, 2004. Employment subsidies - A fast lane from unemployment to work?, Working Paper Series 2004:18, IFAU - Institute for Evaluation of Labour Market and Education Policy.

Kluge, Jochen (2010). The effectiveness of European active labour market programmes, *Labour Economics* 17(6): 904-918.

Sianesi, Barbara, 2008. Differential effects of active labour market programmes for the unemployed, *Labour Economics*, 15(3):370-399.

## List of abbreviations and definitions

ALMP	Active Labour Market Policy
APTrento	Autonomous Province of Trento
ASVAPP	Associazione per lo Sviluppo della Valutazione e l'Analisi delle Politiche Pubbliche
CIA	Conditional Independence Assumption
CIE	Counterfactual Impact Evaluation
COB	Comunicazioni Obbligatorie
COLSaF	Central Office of Labour and Social Affairs
CRIE	Centre for Research on Impact Evaluation
DG EMPL	Directorate General for Employment, Social Affairs and Inclusion
DID	Difference-in-Differences
EE	Estonia
ES	Spain
ESF	European Social Fund
FBK-IRVAPP	Fondazione Bruno Kessler - Istituto per la Ricerca Valutativa sulle Politiche Pubbliche
IAS	Social Support Index
ISCED	International Standard Classification of Education
ISFOL	Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori
IT	Italy
IT1	Italian project 1: Post-secondary vocational training courses: are they effective for Italian unemployed youth with a high school diploma? (VP/2013/005/0044)
IT2	Italian project 2: Evaluating the employment impact of hiring incentives in Italy (VP/2013/015/0005)
LLE	Lithuanian Labour Exchange
LT	Lithuania
MA	Managing Authorities
MoER	Ministry of Education and Research

MS	Member State
NACE	Nomenclature of Economic Activities
OP	Operational Programme
PES	Public Employment Services
PIAAC	Programme for the International Assessment of Adult Competencies
PSM	Propensity Score Matching
PT	Portugal
PT1	Portuguese Project 1: ESF Supporting Youth in Portugal - CIE of Vocational Training and Traineeship' (VP/2013/015/0059)
PT2	Portuguese Project 2: ActiValue: Counterfactual impact evaluation of a large activation programme in Portugal. (VP/2013/015/0065)
RDD	Regression Discontinuity Design
SIA	Social Insurance Agency
SK	Slovakia
Sodra	State Social Insurance Fund Board

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