Counterfactual Impact Evaluation on EU Cohesion Policy Interventions in Training in Companies[1]

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Abstract

An evaluation culture in the EU Cohesion Policy is developing. It applies a more rigorous approach than few years ago. Although the European Commission is introducing a requirement for impact evaluations, such evaluations are still rare. Employment is one of the core objectives of EU policies. Application of the counterfactual impact evaluation on the EU Cohesion Policy enables the inquiry into how one of the most important EU policies operates. The analysis comprises a sample of 373 supported and 202 rejected applicants. The appraisal experts´ approach to applications is used as an instrumental variable to estimate the impacts of the assistance from the European Social Fund in Czech companies through interventions aimed at training of employees. The results indicate positive effects of the European Social Fund's assistance in companies even one year after the support ended. The estimates vary between 3 838 and 5 513 created or saved jobs.

Keywords: *counterfactual impact evaluation, cohesion policy, training, European Social Fund, employment*

JEL Classification: J48, M53

Introduction

Recently, the evaluation practice of the EU Cohesion Policy has been developing rapidly. It has been based mainly on qualitative research methods. The quantitative counterfactual impact evaluation methods have been known and

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applied for decades; nevertheless, the actual application of these methods on the evaluation of public interventions of the EU Cohesion Policy is rare. These methods are not yet widely known to managing authorities of the EU Cohesion Policy programs, or to evaluators (Kváča and Potluka, 2011 or Mouque, 2011a). Filling this gap creates an opportunity for their introduction into practice.

Austerity and the EU member states´ budget problems increase pressure on the need to know how effective the EU funds are. It also raises the question as to what are the true impacts of the policy. Thus, it increases the pressure on the application of the counterfactual impact evaluations (hereinafter as CIE). This is likely the reason why the European Commission applied pressure on the application of these methods to empirically test the impacts of the EU Cohesion Policy (Gaffey, 2009; Martini, 2009; Gaffey, 2011; Mouque, 2011a, 2011b and 2012). The application of impact evaluations will be obligatory as the EU Regulation No 1303/2013 mentions them in Articles 54 and 56 (EU, 2013).

The quantitative research methods investigate macro-policies in various EU member states to empirically estimate impact. For example, Fratesi and Perucca (2014) found dependence of regional policy effectiveness on the type and amount of territorial capital invested in Central and Easter European regions. Artelaris (2015) discusses approaches how to estimate impact of regional policies.

Other studies concentrate on micro-data when estimating the impacts of the EU Cohesion Policy or other programs on Research and Development or employment (Bondonio and Engberg, 2000; Battistin and Rettore, 2002; GEFRA and IAB, 2010; Czarnitzki, Bento and Doherr, 2011; ASVAPP, 2012; Alecke at al., 2002). Tests of impacts of the European Social Fund assistance appear rarely.

Employment is one of five main policy goals of the EU strategy *Europe 2020*. Therefore, this research aims to test whether the European Social Fund assistance in companies attributes to employment. Thus, the research fills the gap in impact evaluation of the EU Cohesion Policy on employment. The paper also discusses likely mechanisms behind the impacts.

The CIE methods evaluate interventions on the national active labor market policies (ALMP) (Wunsch and Lechner, 2008; Hamersma, 2008; Gault, Leach and Duey, 2010; Degravel, 2011; Abramovsky et al., 2011 and Lechner, Miquel and Wunsch, 2011). These studies concern the evaluation of national policies. The research introduced here applies quantitative econometric methods to the EU Cohesion Policy interventions of the European Social Fund in the field of employment.

Several recent studies provide us with different results of the ALMP. Wunsch and Lechner (2008) do not provide optimistic results of reforms on labor market policies in Germany after 1998. Their research tests different types of interventions.

Lechner, Wunsch and Scioch (2013) indicate that there are negative impacts of subsidized employment and longer training program interventions in companies in Germany. Abramovsky et al. (2011) did not find the influence of the UK government pilot program. There is no increase of employability of low-skilled workers by qualification-based and employer-provided training. Hamersma (2008) proved short-term positive effects on employment in companies. In the long-term, however, these positive effects disappear. On the contrary, Lechner, Miquel and Wunsch (2011) indicate long-term positive effects of ALMP interventions on employment as well as rather positive long-term effects are indicated in a meta-analysis conducted by Card, Kluve and Weber (2015) on more than 200 studies from all around the world. Positive impacts of the Regional Selective Assistance program in Great Britain are in the research conducted by Criscuolo et al. (2012). In summary, it is not possible to unambiguously determine and generalize what effects of public policies on employment are and particular studies bring conflicting results.

Although the experience from other EU member states may inspire, Kluve and Schmidt (2002) argue that the experience from one country is not automatically transferable to another due to the heterogeneity of their labor markets. For this reason, the authors provide an independent econometric analysis for one EU member state – the Czech Republic.

After this introduction, the second section describes the intervention under inquiry – the European Social Fund assistance in training in companies' staff. The third section explains the research data collection methodology together with the instrumental variable approach. It is then followed by the fourth section dedicated to the results and discussion. It reveals that there are outlying cases in the sample and the estimates of impact of training on employment are positive in supported companies. The last section concludes with some recommendations on policy design.

Description of the Intervention and Appraisal Process

The Operational Program Human Resources and Employment (HREOP) is a program financed by the European Social Fund (ESF) and the Czech Republic's state budget. The main aim of this program is to support the development of human resources within six priority axes. The presented research examines the priority axis 1 with allocation of approximately 618 million EUR of 2 156 million EUR in the whole program.

The analysis deals with the support area 1.1 focusing on increased effectiveness of the active employment policy and supports the competitiveness of companies

and organizations. In particular, it is performed through the development of professional knowledge, competence and improvement in the qualification of employees and employers (MLSA. 2011, p. 15). Moreover, this area of support focuses on modern management methods and human resource management.

In our research, we use grant projects in which applicants are responsible for the management of projects. This research concentrates on a call for grant projects focused on staff trainings. These calls for proposals were open during the economic crisis to help companies to sustain employment as one of the main objectives of the HREOP. Table 1 provides an overview of the number of applications in the pool of calls for proposals in the HREOP, support area 1.1.

T a b l e 1

Number of Applications in the Grant Calls of HREOP 1.1 Applicable to the CIE

Call	**Notes**	**Applications**		
		Implemented	Not implemented	Total
23	For the actual implementation of the CIE, it is necessary to exclude projects from the dataset, when the supported subjects are associations or educational agencies (it concerns only call No. 23). There are only companies as applicants in this research. In the case of this call, the data sample did not include projects from this call to a dataset with others, as it was not possible to distinguish points for general criteria (data included appraisal for both general and specific criteria merged together).	230	461	691
35	The call is open to applicants from companies and data are used for the counterfactual impact evaluation. This call is used as the basis of dataset for the research.	1 064	738	1 802
39	The call is open to applicants from companies and data are used for the counterfactual impact evaluation in this research.	98	249	347
60	The call was open in 2010. Thus, the applications in this call were not used in our analysis, if the projects were still being implemented in 2011 and 2012.	182	280	462
Total		1 663	1 907	3 570

Source: Monit7 +; own calculations.

In the case of grants, it was arbitrarily determined by the managing authority that the grant is between 1 million to 10 million CZK (approximately 40 000 to 400 000 EUR).

To be able to credibly apply quantitative CIE techniques, a detailed knowledge of the appraisal process is a necessary prerequisite. The appraisal process for investigated calls consists of four steps. The first step consists of formal checks. If all formal requirements (stamps, annexes, eligibility of the applicant, etc.) are met, the application proceeds to the second step.

During the second step, there is an appraisal of the quality of the proposal. Two appraisal experts are randomly selected to validate the quality of the project proposal according to criteria defined by the managing authority (Ministry of Labor and Social Affairs). The criteria are divided into two groups, general and specific. For the research, the set of general criteria is an important part of the appraisal as the appraisal experts have guides and training on how to apply these criteria. If the difference of opinions of the two selected experts is more than 20 points of the maximum of 100 or one expert recommends the application for funding and the second rejects it, a third appraisal expert is invited. Just two appraisals are valid. If the application receives less than 65 points in both valid appraisals, it is rejected. If the application receives more than 65 points in both valid appraisals, it is recommended for support.

In the third step, the selection commission validates the previous steps and project's ranking. The commission can change the status of the application from support to rejection, never vice versa. The commission ranks project proposals according to points awarded in the previous steps. If the funding budget constraint is not binding, then the cut-off point is exactly 65 points. Generally, the first not-supported application´s points awarded is the cut-off point. Contracting is the last step in the appraisal process.

Data and Methods

Data

The data are comprised of two datasets. First, to ensure accountability, the data set from the Czech Statistical Office (CZSO) is used in this research. It covers the period 2006 – 2012. A newer dataset is not available. The newest available dataset is used in the research. The second source of data is the monitoring system Monit7+ from which is obtained information about the projects and their funding.

The financial assistance to companies is used as nominal values. The financial data is not adjusted by inflation as was done by Battistini, Gavosto and Rettore (2001). Adjustment is not necessary as project managers know the market situation and requirements for financial cash-flow, and it was adjusted according to changes in market prices. Other reasons to retain prices in their nominal values are (i) the relatively short period of project implementation that is generally only two years, (ii) stable and low inflation in the Czech Republic, (iii) and the set of usual prices by the HREOP.

Given that all examined grant calls are covered by sufficient financial resources, the limit for acceptance or rejection is 65 points in the general criteria of the appraisal process. The HREOP rules set this limit arbitrarily.

Information about employment was not used from the Monit7+ as the system does provide information only for supported companies, but not for rejected applicants. Moreover, the companies tend to declare jobs as created in an HREOP project which actually do not relate to implementation of a supported project. Thus, the estimation of impacts would be overestimated when using such data. Indeed, Betcherman, Daysal and Pagés (2009) argue that when reporting support results, companies tend to overestimate the number of jobs created compared to reality. Therefore, employment indicators are measured annually and independently of the HREOP. Employment is measured by the Czech Statistical Office as adjusted work (see Table 2 for the definition, Table 3 for the number of companies in the sample and Tables 6 – 9 for detailed statistical description of the sample).

T a b l e 2

List of Variables

Variable	Definition
Employment	It is defined as the sum of three components: a) average number of employees (full-time equivalent); b) full-time equivalent of persons employed under contracts for work and activities; c) number of owners working in the company. The data sample covers 2006 – 2012. The source of this variable is the CZSO data sample.
Company size	Companies were divided into three categories. Small companies are up to 50 employees. Medium-sized companies have more than 50 and up to 250 employees. Large companies have more than 250 employees. Companies were divided into these categories according to their size in 2008. The source of this variable is the CZSO data sample.
NACE	NACE variable is defined as a dummy variable for all 21 NACE categories. Companies were divided into these categories according to their NACE in 2008. The source of this variable is the CZSO data sample.
Region	This variable is defined as a dummy variable for all 14 Czech NUTS II level regions. Companies were divided into these categories according to their residence in 2008. The source of this variable is the CZSO data sample.
Fixed assets	Fixed assets measured in CZK. The data sample covers 2006 – 2012. The source of this variable is the CZSO data sample.
State aid	Sum in CZK classified as State Aid. The source of this variable is the CZSO data sample.
Support	The European Social Fund assistance in particular years 2009 to 2012. Support is measured in CZK. The source of this variable is the Monit7+.
Points awarded	Points awarded by an application by a particular appraisal expert in general criteria. The source of this variable is the Monit7+

Source: CZSO; CEDR III; Monit7+.

The sustainability of created jobs is another pitfall. Girma et al. (2008) indicate that the supported jobs in Ireland usually persist for four years after the end of a grant. Supported jobs are then usually cancelled. Such a finding is of great importance for the long-term strategy for job creation. We use only companies with already implemented projects to test sustainability of employment created

by the assistance. It enables us to compare the estimates with effects during the implementation of assisted projects (comparison with results published by Potluka et al., 2013).

Projects received funding in 2009 and 2011. In 2012, there were 484 companies with finished implementations. It means that the data enable to test the impacts in the phase of sustainability. It allows us to answer the question whether impacts continue after the funding from the European Social Fund.

Preparation of data for individual companies in the grant calls is as follows. Monit7+ data cover the registration numbers of the application and identification numbers which are unique variables. It was converted to data with a unique variable in the form of an anonymous identification number by the managing authority of HREOP to keep companies unidentifiable. In the case that the company applied for support more than once, the cases of the rejected application were removed from the dataset until there remained only one application, either successful or rejected, for a particular applicant in the dataset. There are 17 companies with more supported applications. These companies do not constitute part of the dataset.

This procedure utilizes the data from calls 35 and 39 together that in turn provides a sufficient data sample. Calls 23 and 60 are not involved (see Table 1 for more details).

The estimate is made on the sample of 575 companies for 2012. It covers both successful applicants and rejected applicants. Table 3 displays the sample size according to the size of companies.

T a b l e 3

Structure of the Data Sample According to Company Size

	Applicants		**Cases used in the analysis (supported applicants are without support in 2012)**	
	rejected	supported	rejected	supported
Small companies (< 50 employees)	639	746	28	50
Medium companies (50 – 250 employees)	391	445	101	175
Large companies (> 250 employees)	153	256	73	148
Total of valid cases	1 183	1 447	202	373

Source: CZSO; Monit7+; own calculations.

Characteristics of both the rejected and supported groups of companies in the analysis are similar to the characteristics of the whole sample of 2 630 companies. The difference in sample size is given by the data available. Both groups

used in the analysis consist of companies with complete datasets and finished implementation of projects. These two conditions decreased the number of cases used in the analysis. Moreover, we erased outliers from the dataset. We defined them as companies that are below 3% quantile or above 97% quantile of the change in the indicator of interest. We have applied an approach similar to trimmed means approach (see Manjón et al., 2008, Tohka, Zijdenbos and Evans, 2004, for that approach). We controlled for the difference between these groups by observable variables.

For the estimates of the impact, the variable of sum of employees is used. The employment covers the following three categories: an average number of employees, full-time equivalent of persons employed under contracts for work and activities and number of owners working in the company.

The majority of all projects in the sample covers years 2009 – 2012. For that purpose, the pre-assistance period is defined as 2008 and the intervention period as 2009 – 2011. We used 2008 as a pre-assistance period as there were few projects starting implementation under the call for proposals No. 35 already at the end of 2009. The post-intervention period is 2012 onwards. Selection of these years is based on the dates when the calls for proposals were open and the projects actually implemented. The tests apply the difference of levels not difference of logarithms. The difference of logarithms is too sensitive to changes in the case of small companies.

Methods

In this research, we use the instrumental variable (henceforth IV) method as our preferred method to estimate the effect of the impact on employment in companies. We also provide the ordinary least square (henceforth OLS) estimates, but the OLS method may give biased results as there may be unobserved differences among supported companies and companies in the control group. The observed differences between the two groups – supported and control can be easily dealt with using the dummy variables in the regression models. If the point estimates of the OLS and IV methods are close to each other, it would mean that the selection bias on unobserved compounders is not important. On the other hand, if point estimates of the two methods are significantly different from each other, then the OLS estimates are unreliable and the IV results should be used.

Under certain assumptions, the IV method is an approach that can deal with unobserved systematic characteristics of the treated and control units. The key assumption is the availability of a variable called instrument, which is a variable that should significantly influence the probability of obtaining treatment, but

which should not influence the outcome of the treatment conditionally on the treatment assignment. The instrument creates a quasi-experimental design. The first property of a good instrument (i.e., that it increases the probability of obtaining support) can and should be tested empirically, while the second property is in general untestable and should be examined based on the expert knowledge of the problem in the question.

If the first assumption is not satisfied (or is satisfied only weakly), then the IV estimates will have large confidence intervals and the method would not yield precise results. On the other hand, if the second assumption fails, then the IV results will be biased and unreliable.

In our research, we base our instrument on the differences of appraisal experts through a variable called sum of experts' personal biases – SEPB. The idea is that various appraisal experts exhibit different strictness towards the project proposals. Hence projects that receive a less strict appraisal expert have a higher chance of getting the support. Moreover, the appraisal experts are not in contact with applicants. They do not influence the economic outcomes of companies conditionally on obtaining the support.

Formally, the SEPB variable is constructed as follows:

1. First, we calculate the mean of the points for all evaluations of all applications by all appraisal experts (XN).
2. Then the average scores for each appraisal expert (XH) is calculated.
3. The difference between XH – XN is called 'experts personal bias' (EPB).
4. The sum of all EPBs (SEPB) for each particular application is calculated separately. For each project only evaluations of appraisal experts who actually evaluated a particular application are used.

As noted above, the SEPB as the chosen instrument needs to fulfill two conditions:

a) it must be a significant predictor of the probability that the company receives support;
b) it shall not affect the tested indicator (employment) other than through the obtaining of the assistance.

The second assumption that the appraisal experts do not influence the outcome of interest other than through the probability of support is not verifiable within the statistical model and must be accepted as an assumption. Nevertheless, this assumption is reasonable as appraisal experts are restricted from contact with the applicants.

To check the first assumption, we estimate the discrete-choice model of the probability of receiving support based on SEPB and observable characteristics of companies. Table 4 displays the results for the linear probability model of

the project approval. In this model, the SEPB variable is present together with selected characteristics of companies as NACE, NUTS II, employment and fixed assets, in 2008. It turns out that the only significant regressor is SEPB, while NACE, NUTS II dummies or other variables are insignificant. The fit of the model would remain virtually the same if we exclude all regressors other than constant and SEPB. This demonstrates that the SEPB is indeed a significant predictor of project approval. It also means that the observable characteristics of companies do not play any role in the appraisal process. Therefore, we conclude that the SEPB can be used as the instrument in the IV regression.

T a b l e 4

The First Stage of Two-stage Least Squares Method – an Estimate of the Likelihood of the Project Approval Using a Linear Probability Model (LPM)

	LPM			
	point estimate	std. error	t	p-value
Constant	0.649	0.059	11.087	0.000
SEPB	0.024	0.005	5.012	0.000
Employment in 2008	0.000	0.000	0.462	0.644
Sales in 2008	0.000	0.000	0.748	0.455
Profit in 2008	0.000	0.000	0.065	0.948
CZ-NACE A + B	0.451	0.339	1.333	0.183
CZ-NACE C	0.033	0.083	0.393	0.694
CZ-NACE D	0.013	0.059	0.224	0.823
CZ-NACE E	–0.123	0.117	–1.054	0.292
CZ-NACE F	–0.230	0.133	–1.730	0.084
CZ-NACE G + H	0.039	0.114	0.339	0.735
CZ-NACE J + K	0.010	0.093	0.107	0.915
Southwest	0.087	0.081	1.074	0.283
Northwest	–0.016	0.080	–0.197	0.844
Northeast	–0.010	0.066	–0.145	0.885
Southeast	–0.043	0.063	–0.692	0.489
Central Moravia	–0.009	0.071	–0.128	0.898
Moravia-Silesia	0.015	0.073	0.210	0.834

Note: N = 575; Adjusted R Squared = 0.029.

Source: CZSO; Monit7+; own calculations.

Tested Model

In the model, we control for NACE, Regions, Size, Employment, Fixed assets, and State aid. We use NACE in our models as we expect that some NACE are more export-oriented than others. Moreover, the Czech Republic is a small, open, export-oriented economy. We expect that long-term competitive companies on global markets achieve higher levels of employment. The relationship of competitiveness and role of local and global markets has been fiercely discussed. Porter (2008) points out the importance of a strong position on the domestic market as competition among companies in successful clusters drives companies to higher competitiveness on global markets. Aghion, Harmgart and Weisshaar

(2011, p. 57) add that the foreign competition is much more important for innovation as the global markets are more open to competing companies. They also call attention to the high importance of competition in resource-rich countries. This conclusion is confirmed also by Ayyagari, Demirguc-Kunt and Maksimovic (2011) who conducted a study on a sample of 19 000 companies across 47 developing countries. They identified that innovative companies are usually younger, larger and oriented to export their services and goods. In this case, highly educated managers play a crucial role. It supports our expectation that training financed by the ESF will help to improve productivity in the short-term and increase employment in the long-term.

The region of the company's residence has been introduced to the models as Blažek and Netrdová (2012) analyzed the impact of the crisis on unemployment and regional differentiation in Central and Eastern Europe. They found contradictory tendencies and thus it is not clear whether region of residence plays a role in employment in companies in the Czech Republic. Moreover, the Czech Government resolution No. 560/2006 defines focus regions lagging economically behind in the Czech Republic. We could expect that North-Western Bohemia and Moravia-Silesia belong among the regions with concentrated support and thus with more firms willing to apply for grants.

We presume that larger companies have larger personnel reserves. These reserves could lead to optimizing processes in the time of austerity and decreasing number of employees by reorganizing a company's structure and discharging some employees. If a subsidy has an effect, we could find positive effect of the subsidies on employment. Thus, we control for this by adding variables for the size and employment into the tested models.

Fixed assets have been introduced into the model to control for investment activities of the surveyed companies. Moreover, we introduced also state aid to control for differences between market-oriented and subsidy-oriented companies (Bellmann and Stephan, 2014) in the model.

The research concentrates only on the effects on employment in the supported companies and does not investigate the effect on employees. This would require the collection of data about employees, which are not accessible in this research.

Results and Discussion

We estimate the effect of the support by the ESF grants using a linear model, where we regress the indicator of interest, i.e. the change in employment between 2008 and 2012, on the dummy variable of obtained support and on various dummies that characterize the size of the firm, its NACE, its region.

Table 5 shows the results for the preferred specification that includes the employment in 2008, and the dummy variable for companies in the manufacturing sector. We show the results for two estimation techniques: the OLS model without outliers, the instrumental variable model without outliers (with the SEPB as the instrument for the support).

The estimate of the project support is positive for both models, but it is insignificant for both the OLS and IV model. The point estimates for impact of the support of the OLS methods are higher than those for the instrumental variable, which would mean that the OLS tend to overestimate the effect of the support. We also tried other specifications of the regression model, but no other variable turns to be significant.

We comment the IV results mainly as we see them being credible estimations (for reasons, see the methodological part). We found three mechanisms of the assistance effects in companies which we took into account as we tried to avoid explanations based on subjective responses of managers (see for example a study on the passion and leadership of project managers by Patel, Thorgren and Wincent (2015). The first mechanism is created by the funding of salaries in companies.

The second type of mechanism is a direct employment of project teams in companies supported by the ESF grants (based on information from Monit7+, the mean project teams' size was 1.2 jobs). These two mechanisms are not relevant for companies which already finished implementation of their projects. It is primarily about the priorities of a company for the use of free available resources. It means that at the end of a grant, the company has to continue to employ staff with a long-term contract. If the company does not have an optimistic economic development view, it lacks the initiative to do so. A company with an optimistic economic view employs workers even without the ESF support.

Comparison of the impact estimates of employment during the implementation of assisted projects (Potluka et al., 2013) confirms this conclusion. The estimates of post-assistance impacts on employment are lower than during implementation of the ESF projects. This result is consistent with the results of Girma et al. (2008) about sustainability of jobs created. Our estimates are valid for period of one year after the end of the assistance. Thus, it might happen that after the end of the sustainability-period there will be no more jobs created left.

The economic crisis caused changes on global markets and also in employment in companies. The decrease of employment is connected with changes on the market during the economic crisis. The global recession caused a decrease in demand. It represents a decrease of employment in companies as reported in Table 5. The general trend in decreasing employment continued also at the beginning of the year 2013.

Table 5

Estimates of Impact of the ESF Assistance on Employment in Companies in 2012

	OLS model (without outliers)				IV model (without outliers)			
	point estimate	std. error	t	p-value	point estimate	std. error	t	p-value
Intercept	40.079	18.666	2.147	0.032	42.239	44.210	0.955	0.340
Support	10.190	11.632	0.876	0.381	7.094	60.065	0.118	0.906
Employment in 2008	–0.092	0.018	–4.990	0.000	–0.091	0.018	–4.963	0.000
Sales in 2008	0.000	0.000	4.872	0.000	0.000	0.000	4.880	0.000
Profit in 2008	0.000	0.000	–3.883	0.000	0.000	0.000	–3.865	0.000
CZ-NACE A + B	27.477	92.226	0.298	0.766	31.649	92.340	0.343	0.732
CZ-NACE C	–15.267	23.387	–0.653	0.514	–15.089	23.430	–0.644	0.520
CZ-NACE D	–48.588	16.403	–2.962	0.003	–48.840	16.496	–2.961	0.003
CZ-NACE E	–87.013	32.253	–2.698	0.007	–88.477	32.243	–2.744	0.006
CZ-NACE F	–45.603	37.882	–1.204	0.229	–47.723	37.898	–1.259	0.209
CZ-NACE G + H	–55.087	31.423	–1.753	0.080	–55.105	31.537	–1.747	0.081
CZ-NACE J + K	–17.540	25.639	–0.684	0.494	–17.636	25.664	–0.687	0.492
Southwest	–7.630	22.779	–0.335	0.738	–6.983	22.893	–0.305	0.760
Northwest	–23.394	22.363	–1.046	0.296	–23.414	22.383	–1.046	0.296
Northeast	–28.740	18.742	–1.533	0.126	–29.000	18.757	–1.546	0.123
Southeast	–16.107	17.559	–0.917	0.359	–16.531	17.576	–0.941	0.347
Central Moravia	9.047	19.905	0.455	0.650	8.719	19.925	0.438	0.662
Moravia-Silesia	–21.851	20.239	–1.080	0.281	–21.693	20.257	–1.071	0.285
	Adjusted R Square 0.065; N = 541				Adjusted R Square 0.064; N = 541			

Source: CZSO; Monit7+; own calculations.

Moreover, the large companies focus on different human resource issues than medium-sized companies (Storey, 2002). As mentioned above, larger companies reacted more to the economic crisis and the short-term impact of the crisis was greater on them than in smaller companies. In the long-term perspective, we could expect higher impacts on smaller companies, but such an analysis is beyond the scope of our research due to data limitation.

Regional differences are not important (all estimates are statistically insignificant) from the perspective of impacts as the economic crisis hit all regions and none of the Czech regions are more vulnerable to this problem than the others. It contradicts our expectations that the training projects would have higher effects in the regions economically lagging behind. This fact also does not show differences in the behavior of companies in contradiction to Bellmann and Stephan (2014) who discussed the issue that if a company applies for subsidized wages in Germany, it opens a window to other subsidies and cooperation with labor offices.

During project implementation, the ESF assistance in training partially covered the salaries and costs of companies' staff training. It enabled companies to save some money to invest or other activities to increase their competitiveness. Bernini and Pellegrini (2011) identify that subsidized companies achieve higher growth in output, employment and fixed assets but a lower increase in productivity. This is a very similar case of causal chain behind the subsidies as in our case. There is a significant evidence of differences in the change in employment between the surveyed groups of companies in our research. If the companies increase their competitiveness, also sales should increase. We run similar analysis also for a change in sales. Estimates of impacts of ESF grants on sales were statistically insignificant for both tested models.

Conclusion

Support of employment is one of the key priorities of the EU strategy Europe 2020. The Structural Funds are essential tools for achievement of this priority. Especially, the programs funded by the European Social Fund are crucial parts dedicated to achievement of this objective.

Our research sheds light on whether the support of trainings in companies adds to this objective. We apply the counterfactual impact evaluation approach, which has been a rarely used method to evaluate impact of subsidies on companies' employment.

The results indicate that the European Social Fund investment in companies has a positive impact on employment in the Czech Republic, though the estimates have no statistical significance. From a conservative perspective, there

was not impact found. The positive view is that the impact of 3 838 jobs is found in companies with grant projects. Very optimistically, the ESF assistance attributes to creation or sustainment of 5 513 jobs in supported companies. Moreover, the results concern jobs sustained even when there is no more financial assistance in supported companies.

We confirm that the implementation of the surveyed policy fills the planned target. The surveyed calls for proposals aimed to sustain employment in companies during economic crisis in 2009 – 2011. This objective had been achieved and the policy succeeded in this short-term objective during implementation of projects. We have not confirmed an effect in 2012 when there was no direct funding in surveyed companies any more.

From another perspective, the employment effects were higher and significant during implementation of the projects and slowly disappearing afterwards. Moreover, we have not confirmed the impacts of the training on sales. It raises a question whether the positive effects on employment are sustainable and whether the assistance contributes to long-term competitiveness through higher productivity. Our results do not confirm this.

The limitations of the dataset allowed us to conduct this research for only one year after the support. If the longer time series were available, it would also be possible to test sustainability of jobs when all formal requirements of the ESF support terminate. Moreover, it would be possible to test whether the effects of the ESF support are only short-term or whether they contribute to long-term competitiveness in the supported companies.

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Table 6

Change of Employment in Supported Companies (2008 – 2012)

	MIN	MAX	MEAN	STD	3% quantile	10% quantile	MEDIAN	90% quantile	97% quantile	IQR	Number of cases
All	–2912.840	1403.000	–34.299	242.747	–475.606	–169.920	–6.027	69.959	194.955	68.530	373
Small	–44.701	182.261	14.015	37.520	–33.762	–11.403	3.505	60.497	157.866	23.700	50
Medium	–125.479	1402.998	13.495	117.291	–84.321	–50.905	–2.068	62.412	132.242	40.880	175
Big	–2912.844	904.884	–107.134	351.442	–822.731	–380.621	–53.491	100.825	503.126	178.310	148
NACE A + B	–10.551	117.700	53.575	90.687	–10.551	–10.551		53.575	53.575		2
NACE C	–478.322	1402.998	5.998	277.775	–473.136	–193.956	–0.972	136.700	1269.569	150.460	36
NACE D	–2912.844	904.884	–58.417	267.821	–589.793	–229.243	–9.656	64.022	217.503	80.480	219
NACE E	–327.742	–6.830	–82.491	103.805	–327.742	–306.628	–40.607	–6.968		115.880	11
NACE F	–43.055	46.959	–1.999	27.113	–43.055	–43.055	–5.275			23.510	7
NACE G + H	–1270.949	37.103	–96.327	328.239	–1270.949	–604.389	–8.311	31.553		48.990	15
NACE I	–43.511	605.849	92.112	190.294	–43.511	–23.877	37.115	579.141		63.630	17
NACE J + K	–32.785	69.440	18.212	28.745	–32.785	–12.986	7.867	63.876		42.850	25
Central Bohemia	–974.800	81.324	–85.906	219.348	–945.677	–360.082	–8.983	46.534	77.628	65.820	38
Southwest	–546.180	297.878	–44.478	156.634	–539.921	–248.353	–7.728	54.085	277.544	86.580	36
Northwest	–235.599	385.747	–18.389	103.712	–235.599	–119.070	–12.952	52.140		80.720	32
Northeast	–2912.844	904.884	–73.477	411.963	–979.134	–190.479	–9.798	68.315	280.765	91.280	60
Southeast	–464.475	196.349	–25.848	109.004	–309.937	–186.876	–2.707	80.601	182.834	55.460	69
Central Moravia	–839.796	424.937	–31.627	189.122	–822.850	–100.496	–11.368	104.999	310.902	51.420	47
Moravia-Silesia	–465.977	415.824	–9.446	121.014	–404.789	–90.980	–1.340	64.481	352.520	49.270	45

Source: Monit7 +; CZSO; own calculations.

Table 7

Change of Employment in Rejected Companies (2008 – 2012)

	MIN	MAX	MEAN	STD	3% quantile	10% quantile	MEDIAN	90% quantile	97% quantile	IQR	Number of cases
All	–3726.550	483.410	–65.416	336.752	–632.027	–176.017	–13.304	61.467	265.108	68.400	202
Small	–27.954	294.598	14.860	59.836	–27.954	–18.324	0.073	75.064	.	20.780	28
Medium	–116.803	254.189	1.502	45.540	–68.792	–39.659	–8.147	47.101	97.740	40.320	101
Big	–3726.547	483.411	–188.790	536.785	–1697.978	–486.489	–78.482	107.992	383.514	177.110	73
NACE A + B											0
NACE C	–825.832	483.411	–22.658	255.230	–825.832	–324.583	–8.098	332.035		43.120	17
NACE D	–3726.547	407.616	–82.347	403.304	–730.397	–179.371	–15.341	37.646	259.709	66.700	117
NACE E	–164.307	97.365	–22.587	67.880	–164.307	–154.956	–14.129	90.268		68.620	10
NACE F	–78.482	294.598	33.882	114.458	–78.482	–78.482	3.425			90.170	8
NACE G + H	–320.856	43.504	–67.912	130.198	–320.856	–320.856	–12.944			172.180	7
NACE I	–184.904	16.457	–69.260	90.148	–184.904	–184.904	–56.069			176.420	5
NACE J + K	–260.797	92.068	–15.902	88.974	–260.797	–203.199	–2.289	80.134		57.120	13
Central Bohemia	–511.913	483.411	–18.253	169.729	–511.913	–227.079	–13.931	124.590		86.990	25
Southwest	–247.131	75.057	–40.304	91.933	–247.131	–246.862	–16.506	58.823		56.870	15
Northwest	–1061.491	97.365	–131.364	285.657	–1061.491	–685.665	–29.695	31.492		134.620	18
Northeast	–448.354	266.188	–44.653	125.064	–447.551	–158.561	–22.066	19.297	264.316	61.930	33
Southeast	–1804.105	298.061	–38.416	284.428	–1194.268	–100.639	–8.967	72.633	296.591	65.940	45
Central Moravia	–208.671	407.616	6.290	113.898	–208.671	–68.364	–4.154	111.145		41.710	28
Moravia-Silesia	–3726.547	82.298	–207.637	811.025	–3726.547	–289.487	–10.946	57.260		74.890	21

Source: Monit7 +; CZSO; own calculations.

Table 8

SEPB in Supported Companies

	MIN	MAX	MEAN	STD	3% quantile	10% quantile	MEDIAN	90% quantile	97% quantile	IQR	Number of cases
All	–10.156	12.477	0.224	4.260	–6.931	–5.097	–0.175	6.081	9.830	5.050	373
Small	–9.077	9.830	0.659	4.128	–7.224	–4.650	–0.175	6.081	9.830	5.580	50
Medium	–9.077	12.477	0.093	4.247	–6.800	–5.447	–0.175	4.827	9.830	5.168	175
Big	–10.156	9.830	0.233	4.338	–7.811	–5.421	–0.175	7.033	9.830	5.050	148
NACE A + B	–4.888	–1.463	–3.176	2.421	–4.888	–4.888		–1.463	–1.463		2
NACE C	–9.077	9.830	0.890	4.160	–8.692	–4.749	1.356	5.349	9.792	4.500	36
NACE D	–10.156	9.830	–0.100	4.190	–7.283	–5.486	–0.175	4.627	9.830	5.168	219
NACE E	–4.954	9.486	0.679	3.642	–4.954	–4.409	0.870	8.088		3.333	11
NACE F	–2.672	9.830	2.590	4.538	–2.672	–2.672	1.046			7.890	7
NACE G + H	–6.465	3.158	–1.553	2.724	–6.465	–5.934	–1.463	2.761		2.028	15
NACE I	–4.265	9.830	2.158	4.317	–4.265	–3.112	1.046	9.555		6.852	17
NACE J + K	–9.077	7.033	0.183	3.904	–9.077	–4.514	–0.175	6.081		4.817	25
Central Bohemia	–6.128	9.830	–0.826	2.910	–5.933	–4.650	–0.966	2.262	8.933	2.439	38
Southwest	–10.156	4.553	–0.852	3.986	–10.037	–7.575	–0.826	3.924	4.553	5.596	36
Northwest	–7.811	9.830	0.448	4.534	–7.811	–5.819	0.237	6.748		6.640	32
Northeast	–6.477	12.477	0.352	4.751	–6.467	–5.480	–0.858	9.550	10.280	4.917	60
Southeast	–9.077	9.830	0.321	3.929	–9.013	–5.097	1.018	4.627	7.033	4.776	69
Central Moravia	–6.931	9.830	0.121	4.102	–6.578	–5.453	–0.123	4.727	9.679	6.761	47
Moravia-Silesia	–8.442	9.830	0.457	4.489	–8.202	–5.581	–0.738	7.033	9.830	5.194	45

Source: Monit7 +; CZSO; own calculations.

Table 9

SEPB in Rejected Companies

	MIN	MAX	MEAN	STD	3% quantile	10% quantile	MEDIAN	90% quantile	97% quantile	IQR	Number of cases
All	–9.077	9.830	–1.515	3.899	–8.385	–6.364	–1.391	3.158	7.033	6.220	202
Small	–9.077	9.830	–0.160	4.395	–9.077	–6.162	–0.794	7.033	–9.077	5.190	28
Medium	–9.077	7.602	–1.487	3.813	–6.931	–6.128	–1.319	4.274	7.033	5.966	101
Big	–8.442	7.602	–2.073	3.738	–8.442	–6.472	–2.557	2.256	7.033	5.980	73
NACE A + B											0
NACE C	–8.442	3.158	–2.185	3.310	–8.442	–6.591	–2.557	2.436		5.570	17
NACE D	–9.077	9.830	–1.988	3.751	–8.442	–6.465	–2.232	2.369	7.033	5.628	117
NACE E	–6.477	7.602	–1.778	4.445	–6.477	–6.442	–1.654	7.038		6.486	10
NACE F	–5.421	7.033	0.692	4.344	–5.421	–5.421	0.126			7.746	8
NACE G + H	–6.477	3.158	0.084	3.256	–6.477	–6.477	1.353			3.870	7
NACE I	–2.823	7.033	3.151	4.155	–2.823	–2.823	3.158			7.768	5
NACE J + K	–6.128	7.033	0.401	4.451	–6.128	–5.845	–0.794	7.033		7.702	13
Central Bohemia	–6.931	7.602	–0.922	3.964	–6.931	–5.882	–0.966	4.708		6.906	25
Southwest	–7.811	6.081	–2.565	4.088	–7.811	–7.010	–3.734	3.609		7.173	15
Northwest	–9.077	2.592	–1.874	3.372	–9.077	–8.505	–1.022	2.251		3.952	18
Northeast	–6.465	7.033	–1.977	3.293	–6.458	–5.871	–2.232	1.980	6.985	4.818	33
Southeast	–9.077	7.033	–1.914	3.960	–8.836	–6.470	–2.232	4.176	7.033	6.095	45
Central Moravia	–9.077	7.033	–1.331	4.018	–9.077	–6.931	–1.079	3.545		6.463	28
Moravia-Silesia	–6.465	9.830	–0.242	4.977	–6.465	–6.397	–1.663	7.033		8.048	21

Source: Monit7 +; CZSO; own calculations.