

Methods to Evaluate the Employment Impact of Business Incentives in EU Areas with Declining Industrial Production¹

Metodi per la Valutazione dell'Impatto Occupazionale degli Aiuti alle Imprese nelle Aree a Declino Industriale dell'UE

Daniele Bondonio

Università del Piemonte Orientale e Carnegie Mellon University
Corso Borsalino 50, 15100 Alessandria. Pittsburgh, PA 15213-3890.
daniele.bondonio@sp.unipmn.it; db92@andrew.cmu.edu

Riassunto: Gli interventi di aiuto alle imprese nelle aree a forte declino industriale hanno assunto nell'ultimo decennio un ruolo di primo piano come strumenti di politica economica regionale dell'UE. Il presente lavoro propone alcuni modelli di analisi per la valutazione dell'impatto occupazionale di tali interventi. I modelli proposti sono illustrati mediante un'applicazione empirica: la valutazione degli interventi promossi nelle aree a declino industriale del Piemonte. I risultati dell'analisi evidenziano l'assenza di significativi cambiamenti occupazionali indotti dagli interventi in esame e la robustezza dei modelli proposti rispetto a cambiamenti di dati, specificazioni e/o ipotesi sul processo di selezione delle aree target.

Keywords: Impact evaluation, panel data analysis, business incentives, declining industrial production areas, European Regional Development Fund

1. Introduction

In the last decade, business incentive initiatives (co-financed through the European Regional Development fund –ERDF) have become a popular regional economic development tool for the EU areas with declining industrial production (Objective 2 areas). To date, business incentive packages have been offered in more than 80 Objective 2 (Ob.2) areas covering 18% of the EU population. In the 1994-96 programming period alone, about 5 billion Euros (amounting to 11% of the entire EU budget dedicated to the fulfillment of economic and social cohesion objectives) were drawn from the ERDF to finance incentive packages to support mainly Small and Medium Enterprise (SME) investments that can boost employment in Ob.2 areas. These types of initiatives also have an important role in the current 2000-06 EU regional policies and follow similar incentive packages offered from the beginning of the eighties in disadvantaged areas (referred to as Enterprise Zones) of the US and the UK.

Despite the wide popularity of these initiatives, no robust and consistent ex-post evidence on their employment impact in the Ob.2 areas is yet available to help EU

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policy makers refine future geographically-targeted economic development policies. Available ex-post employment impact results are indeed mostly derived through applying standard macroeconomic multipliers to the volume of investments co-financed by the ERDF in the Ob.2 areas. This evaluation practice is of limited use as it does not attempt to measure the actual net pre-post intervention employment change in the target areas and as it cannot estimate marginal differences in the employment impact due to the different program features adopted across EU regions and/or countries.

Robust ex-post impact evaluations based on actual pre-post intervention data, however, are difficult to achieve. Assessing the causality link between the program intervention and the observed employment outcomes is a difficult task as it requires disentangling changes due to the program from changes due to all of the economic and social factors exogenous from the program intervention. This task is also particularly demanding due to the lack of experimental data for the evaluation: Ob.2 areas have disadvantaged local economies that would perform differently from their respective national economies. As a consequence, impact estimates can be retrieved with significant degrees of *selection* and *omitted variable bias* if the analysis is not carefully implemented controlling for the different spontaneous economic trends and/or for all of the exogenous economic factors affecting employment outcomes concurrently with the program interventions (Bondonio 2000).

The main feature of this paper is to propose a method of analysis to robustly estimate the net employment impact of business incentives offered in the EU Ob.2 areas. The proposed method is illustrated in this paper through a case study: the evaluation of the business incentive program implemented in the Ob.2 areas of Piedmont during the 1994-96 period. The results of the analysis show that the incentive program implemented in the Piedmont region did not significantly affect the employment growth recorded in the Ob.2 areas. The robustness of these results is tested through the development of an extensive sensitivity analysis that highlights how the non-significance of the impact estimates is consistent across a number of different specifications, data, and estimators.

2. Evaluation Strategy and Model Specifications

The proposed evaluation strategy is developed using a “comparison group evaluation design” where the pre-post employment change recorded in the target areas is compared to those of adjacent non-target areas. Impact employment estimates are then retrieved from empirical models that make use of a panel of employment data sorted by industry and aggregated by geographic units corresponding to the Ob.2 areas and adjacent regions (such types of data are typically available from national social security sources and/or census of enterprises). This general evaluation strategy has proven reliable for the US Enterprise Zone programs (Boarnet and Bogart 1996, Papke 1994, Bondonio and Engberg 2000, Bondonio 2001) and is implemented in this study through a number of econometric specifications that allow impact estimates to be retrieved net of the following unobservable factors exogenous to the program intervention:

- local economic trends that may affect Ob.2 areas differently from the non-Ob.2 areas of the EU;
- cyclical macroeconomic factors that may affect the employment growth of both Ob.2 and non-Ob.2 areas during the program intervention period;

- market growth conditions that may affect the performance of target industries differently from those of non-target industries;
- structural characteristics of Ob.2 areas that may differ from those of non-Ob.2 areas.

The econometric specifications developed in this study also allow the marginal employment impact of the different degrees of the programs' financial generosity to be estimated together with the differences in the employment impact due to the possible different degrees of labor intensity across industries. In formal terms, such specifications stem from the following simple general model:

$$\ln Y_{pjt} = I_t + bS_{jt} + gP_{pt} + fT_{pjt} + IA_t + \alpha_{pj} + u_{pjt}, \quad (1)$$

where: p =province; j =industry; t =time (in years); Y_{pjt} =aggregated employment by province, industry and year; S_j =[1 if the industry j includes SMEs awarded by the incentives; 0 otherwise]; P_p =[1 if the province p is an Ob.2 areas; 0 otherwise]; A_t =[1 if the incentives were paid in the year t ; 0 otherwise]; $T_{pjt}=(S_j * P_p * A_t)$; α_{pj} =time-unvarying fixed effect component specific of each province-industry pair; u_{pjt} =iid $(0, \sigma^2)$ error.

To estimate the specification of eq. (1), a long- or first-differencing transformation as in eq.(2) is suggested to avoid the possible bias deriving from $cov(\alpha_{pj}, T_{pjt}) \neq 0$,

$$\ln(Y_{pjt}/Y_{pjt-n}) = I^* + bS_j^* + gP_p^* + fT_{pjt} + IA_t + e_{pjt}, \quad (2)$$

where: $e=Du$; $T=DT$; $A=DA$; $\lambda^* = In$; $S^*=Sn$; $P^*=Pn$.

A long-differencing ($n>1$) is often to be preferred to a first-differencing ($n=1$), or to a difference from the mean $[\ln(Y_{pjt}/Y_{pj})]$ transformation when data is imprecise as for the date of payment of the incentives awarded to the target business (measuring error in A_t). The models of eq. (1) and (2) are formalized with a simple linear specification due to the often limited number of observations available for the analysis (for the same reason, propensity score models or statistical matches between target and on-target areas are difficult to implement for these types of programs).

The simple general model of eq. (2) can be made more flexible [allowing the impact of the different degrees of the programs' financial generosity to be estimated along differences across industries] with the following specifications:

$$\ln(Y_{pjt}/Y_{pjt-n}) = I^* + \alpha_J b_J S_J^* + gP_p^* + fFin_{pjt} + e_{pjt}, \quad (3)$$

where: $J=[(1,...M)]$ being M =number of industries in which the target SMEs operate]; $\alpha_J b_J S_J^* = [\text{set of } M \text{ terms } (b_1 S_{1J}^*, \dots, b_M S_{MJ}^*) \text{ being } S_{J}^*=(1 \text{ if } j=J; 0 \text{ otherwise})]$; Fin_{pjt} = money value (per job at time $t-n$) of the incentives paid in the period $[t-(t-n)]$ to SMEs in the industry j and province p ;

$$\ln(Y_{pjt}/Y_{pjt-n}) = I^* + \alpha_J b_J S_J^* + gP_p^* + \alpha_J f_J Fin_{Jpjt} + e_{pjt}, \quad (4)$$

where: $\sum_J \phi_J Fin_{Jpjt}$ =set of M terms $(\phi_1 Fin_{1pjt}, \dots, \phi_M Fin_{Mpjt})$ being $Fin_J=(Fin \text{ if } j=J; 0 \text{ otherwise})$.

3. Results from the Case Study: the Employment Impact of Business Incentives in the “Ob.2” areas of Piedmont

Table 1 reports the results of the analysis for the evaluation of the business incentives supporting investment in industrial productions by SMEs located in the Ob.2 areas of Piedmont in the 1995-1998 period. Employment data are taken from INPS (Panel of employment data cross tabulated by province, industry, and size of enterprises); data on incentive payments are taken from reports monitoring the program intervention. Results are reported for the specification of eq. (2) and eq. (3) [the latter in a more parsimonious specification replacing $\hat{a}_j b_j S_j^*$ with $b S_j^*$ to reduce the coefficients' standard errors]. For space constraint, results from the specification of eq. (4) and from an extensive sensitivity analysis (including the use of different data, changes in the econometric specifications, and the adoption of different panel data estimators) are not reported. These results are very similar to those of Table 1 and are available (along to a lengthier version of the paper) upon request to the author.

Table 1: Impact of Business Incentives in Ob.2 Areas of Piedmont

Dip. Var.: 1995-98 employment growth rate

Independent Variables	Specifications	
	Eq.(2)	Eq.(3)
<i>Constant (I)</i>	0,161*** (0,031) 0,000	0,159*** (0,028) 0,000
<i>Treatment Dummy</i>	0,007 (0,108) 0,947	-
<i>Incentive Money Value</i> (Millions of It. Lira per existing job in 1995)	-	-0,011 (0,052) 0,826
<i>Industry Control Dummy (S*)</i>	-0,100** (0,045) 0,026	-0,097** (0,042) 0,023
<i>Province Control Dummy (P*)</i>	0,027 (0,075) 0,713	0,037 (0,062) 0,542
Number of Observations	266	266
Adjusted R2	0.202	0.154
Prob>F	0.0234	0.0597

* p-value<0.1 ** p-value<0.05 *** p-value<0.01 -Std. dev. in parenthesis, P-val. in italics

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