

The economic impact of public regional industrial policies: An empirical investigation

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Introduction

In this paper we explore the issue of the effectiveness of public direct subsidies aimed at stimulating entrepreneurial activity. Recently, the interest among the scientific community and the policy makers on the topic has been growing fast. There is a widespread belief that public capital subsidies can modify industrial dynamics at local level in both the short and long runs. This belief has been used as support for policies aimed at stimulating growth by awarding subsidies to the private sector, both at the super-national, national, and regional levels. Alongside the traditional argument for subsidies, namely market failures, there are at least two other sources for this belief. On the one hand the literature on growth stresses the idea that, in presence of diminishing returns of capital, investments should head toward less developed areas that, in principle, can grant higher returns on investments (Barro and Sala-i Martin, 1998). However, the convergence process might be occurring too slowly to be socially acceptable, hence the need to subsidize underdeveloped areas. On the other hand, the literature on localization Fujita and Krugman (1995) stressed the importance of policies aimed at attracting mobile resources, such as capitals, entrepreneurs, and specialized labor, that, idiosyncratically combined with local immobile resources, allow for local positive externalities from aggregation. The obvious counterarguments (see for instance Bergstrom (1998)), in turn, identify in the displacement of private investments and in the generation of both technical and allocative inefficiencies the main causes for failures of the subsidizing efforts by the public authority.

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Alongside these theoretical issues, empirical investigations of the effects of subsidies on growth and productivity seem to be problematic at best. Studies on the effect of subsidies in developed Asian countries, for instance, point to a negative effect of subsidies on productivity (Lee, 1996; Beason and Weinstein, 1996; Harris and Trainor, 2005). Bergstrom (1998), in a study on regional subsidies for Sweden, finds contradictory effects of subsidies on productivity. In the short run productivity seems to increase for subsidized firms, whereas after a while the trend reverses and the more a firm received in subsidies, the less its growth in terms of TFP. Similarly, on Italian data, Bagella and Becchetti (1998); Pellegrini and Centra (2006); Bronzini and De Blasio (2006) find a set of partly contradictory results. In the short run, subsidies seem to cause a higher level of indebtedness for firms which receive them with non-decreasing costs of debt, so apparently there is no misallocation of financial resources. In the long run, subsidized firms exhibit lower levels of productivity when compared to non-subsidized ones, lending support to the idea that this exogenous "shock" is reabsorbed by the market.

Starting from these considerations we aim at giving a contribution to the current empirical literature on public subsidies on three different levels. The first one regards the short *vs* long run policy effectiveness dilemma. Literature on the issue provide mixed results.

Methods and data collection

The analysis uses a new, unique, specifically built, dataset which presents two major advantages: (a) it includes the whole population of firms in an Italian province (Trentino); (b) it includes information about regional policies implemented in the last 15 years.

On the basis of these high quality data, we test the causal effects both in the short and long run trying to reconcile empirical evidence with a coherent theoretical interpretation. In particular, we argue that, if the effectiveness of policies is negatively related with time -i.e. if we observe a vanishing effect of policies on industrial structure and firms' performances- then we must at least reconsider the modality of public intervention. The study of the economic effects of public subsidies can be considered a particular case of the general problem of the evaluation of the average effect of a treatment in a sample in which both treated and untreated units are present (Imbens and Rubin, 1997; Ichino, 2002; Angrist and Hahn, 1999)¹. In our study we estimate the effect of the concession of direct public subsidies (treatment) on different measures of firms' performance (objective variables). The major issues arising in such framework is the potential bias due to the fact that economic data do not come from a controlled experimental setting in which the assignment to treatment is completely random. In other words, firms do not receive a financial assistance for their investments randomly, on the contrary, we can assume that their characteristics influence the probability of receiving such subsidies. In particular, we use the conditional difference-in-difference estimator that can be considered an

¹See Petersen (2003) and Lechner for an interesting application of the MMs to the role of labor market policies.

extension of the approach introduced by Pellegrini and Centra (2006) and Smith and Todd (2005). The choice is motivated by the need of reducing any bias present in unobserved characteristics of firms. In fact, CDID methodology avoids all the distortions in the evaluation of results given by non-time varying factors.

Our model formulation strategy aims at discriminating between short and long run effects of the direct subsidies.

Results

We present the main results of our analysis recursively using descriptive data first, and then commenting on the causation effects between variables by means of the results obtained from the Propensity Score Matching Models we estimated. We will detail results for firm size growth (measured by the number of employees), profitability, and capital intensity. The relative performances of subsidized *vs* non-subsidized firms are evaluated at different lags with respect to the concession of the subsidy.

The first effect we analysed is the capability of subsidies to generate employment growth. There are two reasons to explore this variable. On the one hand, employment growth is one of the main explicit objectives of public intervention in this case. On the other hand, an employment growth might be considered as a good proxy for the state of the local economy. Results show that subsidised firms experience a significantly higher ability to generate net employment growth in the short run, but that, once again, this effect disappears in the long run. In other words, we find evidence of a sort of "J" effect.

An analysis of profitability shows that subsidized firms exhibit a higher performance both in the short and long runs. This is true both from a purely descriptive viewpoint and using matching models. Apparently, thus, subsidies can effectively impact on a firm's profitability both in the short and in the long run. In contrast with what we said commenting on employment growth this effects are long lasting.

One last variable of interest is the relationship between capital and labor for subsidized firms. Essentially we are interested in this relationship because of the generally accepted idea that firms optimize over this combination in order to achieve efficiency in the production process. An obvious corollary of this statement is that public subsidies might interfere with this optimization process. Specifically we expect firms to change their combination of productive factors in response to these external shocks. Looking at the descriptive results firms that were never subsidized show, on average, a lower capital to labor ratio. Subsidized firms, by contrast, exhibit a higher capital to labor ratio. However, this ratio tends to decrease in the long run. This means that, in the short run, subsidized firms find it effective to modify their production factors mix, even though this shock is, once again, reabsorbed in the longer run. Notwithstanding, incentives are capable of stimulating investments. Correspondent matching models show that the effect of subsidies on capital intensity in the short run is not clear. In the long run a significant negative effect seems to prevail.

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