Spatial Evaluation of Public Credit Guarantees for Italian SMEs

Marusca De Castris, Guido Pellegrini

Abstract: The recent literature on the effects of the Central Guarantee Fund (CGF) shows a positive but moderate effect of CGF on subsidized firms and involved regional economies. Nevertheless, the results neglect the presence of spatial relations across firms and regions. The spillovers can be positive, on the demand side, or negative, tightening factor markets. In this paper we deal with spatial effect of CGF, considering spillovers across NUTS-3 areas in Italy. The impact is decomposed into direct effects on the NUTS-3 areas where the guarantees are required, and indirect effects from the neighboring areas. We use different models combining a «long» DID approach and a spatial Durbin model. The results suggest that there is a positive and statistically significant, albeit modest, correlation between the use of CGF and the growth of provincial economies, controlling for sectoral differences, dimensional characteristics and several interactions. The presence of spatial spillovers marginally increases the positive effect of the CGF.

Keywords: guarantee fund, impact evaluation, spatial econometrics.
JEL classification: G28, R11, H81.

1. Background and motivations

Public guarantee schemes are well-known instruments aimed at facilitating access by small and medium-sized enterprises (SMEs) to external finance. Many governments provide credit guarantees to SMEs for start-up and expansion. In the course of the global financial crisis, several countries have implemented public credit guarantee schemes as countercyclical programmes, inducing a significant increase in their extent and use (Gozzi, Schmukler, 2016).

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However, while these programmes have been implemented for years, their evaluation has been rare. Recently, several contributions have proposed an assessment of the performance of credit lending programs, but the empirical evidence has provided mixed, if not contradictory, results. In Italy, few papers evaluate the impact at firm level. Both Zecchini and Ventura (2009) and Mariani *et al.* (2013) show a positive impact of public guarantees schemes on credit availability. By contrast, D'Ignazio and Menon (2013) evaluate a local Italian guarantee scheme and provide evidence that the program had no significant impact on the total volume of firms' bank debt. Also, de Blasio *et al.* (2017) assess the impact of the Central Guarantee Fund on subsidized firms. They show that the scheme does not affect the interest rate charged by banks, while it positively affects the likelihood that a firm is unable to repay its loans. Moreover, no effect is found on firms' investments. Boschi *et al.* (2014) estimate the effect of partial credit guarantees on firms' financing, showing the importance of heterogeneity in guarantee intensities that influence additionality effect. An evaluation at territorial level is presented only in De Castris and Pellegrini (2016).

In other countries, the evaluation of credit guarantees schemes shows weak evidence of the positive impact of the public guarantee scheme on credit and firms performances. Hancock *et al.* (2007) estimate the impact of credit guarantees at firm level in USA, showing positive effects on firms' output and employment. Riding *et al.* (2007) find that in Canada the scheme had a positive impact on loans financed by banks. Lelarge *et al.* (2010) evaluate a French scheme, and they find a positive effect on credits availability, interest rates and firms' output. Kang and Heshmati (2008) evaluate Korean schemes and provide weak evidence in favor of credit guarantees with respect to firms' sales, productivity and employment. Uesugi *et al.* (2010) show that in Japan firms use loans only to cover operating losses.

All these papers evaluate the performance of the subsidized firms, comparing them to a credible counterfactual scenario. However, policy makers are concerned with the overall effects of the policy instruments on the regional economy: the net effects can be different from the cumulated effects on treated firms in the presence of (negative or positive) spillovers or any kind of economic interference.

In the international literature, only Craig *et al.* (2007) have assessed the effectiveness of guaranteed loans in regional markets. Using data on Metropolitan Statistical Areas in the USA, they show a positive relation between growth of per capita income in the areas and amount of guaranteed loans. De Castris and Pellegrini (2016) estimate the overall effect of national CGF at provincial level, correlating the use of the CGF with the growth of employment and firms. However, these papers do not consider that the effect of the CGF may be direct on the NUTS3 areas where the guarantees are required, and indirect in the neighboring areas. The presence of spatial relations among firms in different regions affect the sign

and the size of spillovers, which can be positive, on the demand side, or negative, tightening factor markets.

The aim of our paper is to evaluate the impact of the Central Guarantee Fund (*Law 662/96 Art. 2 Comma 100 Lett. A*) on the economic growth of the Italian provinces. The Central Guarantee Fund (henceforth CGF) is a public guarantee scheme addressed to micro, small and medium-sized enterprises to support access to bank credit, both for investments and cash. Our empirical evaluation strategy is based on a «long» DID estimator at NUTS-3 level for Italy, taking account of endogeneity in the model and the presence of spatial relations among firms and regions. To our knowledge, our paper is the first to assess the overall effect of an Italian public guarantee scheme on local growth by considering special interferences.

From an economic point of view, there are many reasons justifying the existence of a public guarantee scheme (De Castris, Pellegrini 2016; Gozzi, Schmukler, 2016). However, assessment of the overall impact of the instrument on the regional economy should consider the presence of spillovers within the territorial unit or among the closest territorial units. Firms subsidized by government guarantees usually generate a crowding-out effect versus the closest unsubsidized enterprises in terms of credit, investment, input or output. In other words, government guarantees can generate negative spillover effects in the local area and also in the closest regions. In this case, the net effect of the policy on the region could be uncertain: indeed, the positive effects may outweigh the negative spillovers generated by the intervention on the local economy. Therefore, the presence of a positive effect is basically an empirical issue that has to be measured using the instrument of causal models and spatial analysis.

The adopted model considers the presence of spillovers. In general, spatial spillovers are generated by economic relations linking spatially neighbouring firms. However, spillovers may be related to economic relationships among different sectors, sizes and territories. The multiplicity of these links entails the need to reduce their dimensionality so that they can be efficiently estimated and overfitting of the model be avoided. We adopted the following restrictions, which are linked to the theoretical analysis of the spillover effects: no spillovers between different sectors; no spatial spillovers of an order higher than the first one. Therefore, the chosen approach considers three categories of spillovers: (size) spillovers between firms of different sizes in the same sector and region; (spatial) spillovers between firms of the same size and sector in adjacent regions; (size and spatial) spillovers between firms of the same sector but of different sizes in adjacent regions. This method captures a rich range of interactions among firms and regions, using a feasible econometric approach.

The econometric analysis shows that there is a positive and statistically significant, albeit modest, correlation between the use of the Fund and the growth of the provincial economy. The presence of spatial spillovers margin-

ally increases the positive effect of the CGF. Although the empirical evidence that this is a causal relationship remains very difficult and complex, the estimation strategy, in some aspects innovative with respect to the literature, is robust to different specifications of the model.

The paper is constructed as follows. The next section presents the public instrument. The evaluation strategy and the proposed econometric model are presented in section 3, the source of the data in section 4, the proposed econometric model that includes the presence of spatial spillover in section 5. Finally, in section 6, we analyse the results of various estimates, reporting also a robustness analysis. The last chapter states some conclusions on the overall effects of the instrument, considering the direct and indirect impact on the regional growth.

2. The programme

The CGF is a public instrument devoted to help small and medium-sized enterprises, which have several difficulties in financing themselves on the credit market, to receive the credit that they need. In Italy, since the beginning of the international crisis, a large number of SMEs have felt the credit crunch and experienced a reduction of credit flows and high interest rates.

The CGF offers guarantees only to SME operating in the manufacturing, construction and services sectors, excluding agriculture, automobiles and finance. Enterprises can obtain up to 80% of the value of a bank loan, not exceeding the maximum amount of guarantees for each one, equal to 1,5 million euros. The CGF issues both short-term and long-term loans for the final use.

The admission procedure is as follows: a SME that needs to borrow may ask the bank to apply for a public guarantee or, alternatively, a bank may advise the firm to apply for the guarantee; the eligibility of the firm for the scheme is evaluated by a scoring system provided by the CFG that considers mainly financial stability, short-term financial burden and cash-flow; on the basis of the score, the firms that are eligible have to undergo a further assessment, which concludes with the final approval or rejection.

The CGF has been operating since 2000. In a period of approximately 13 years (until 31 December 2013) the CGF granted 299,115 guarantees to 173,833 SMEs: 47,34 euros billion of loans to SMEs eligible for the public guarantee. The scheme has been recently re-financed, also with the reprogramming of the Structural Funds, and is now the measure most financed by Italian regional and industrial policies.

The average size of enterprises guaranteed by the CGF is small, as to be expected: 66% are micro enterprises, 26% are small, the remaining 8% are medium-sized enterprises. Usually firms access the CGF several times. On average each company which had access to CGF received 1.7 guarantees and

an average amount of loans guaranteed by CGF of about 272,331 euros. For micro enterprises this figure is 109,000 euros, for small ones it is around 432,000 euros, for medium-sized companies around 1,073,000 euros. Most guarantees have been granted on loans directed to finance firms' current operations, which also includes working capital and stocks (more than 81%).

3. The identification strategy

The regional net effect of the policy's instrument can be evaluated by comparing the dynamics of regional development indicators (such as the employment growth rate, or value added growth rate, or firms' growth rate) for a given spatial dimension to the level of the policy. The analysis evaluates the presence of a correlation, positive or negative, between the use of the guarantee funds and the economic growth. The effects identified, if any, would be the overall effects, including spillovers. This approach also has an interesting advantage: it observes not only the presence or absence of the policy, but also its intensity[1].

A potentially serious problem in evaluating the effects of such policies is the presence of spillover effects among firms and areas. In fact, if the untreated firms that form the control group are affected by spillovers from treated firms, the estimated treatment effect is biased even in the case of a random experiment. Moreover, in the presence of negative spillovers the policy attractiveness of the programme may change. For example, evidence that Public Guarantee Schemes lead to job growth may be regarded quite differently depending on whether the treated firms have created new jobs, or workers have moved from one firm to another to take advantage of better economic conditions. Of course, relocation among firms does not necessarily imply that a programme has not succeeded. However, policymakers should evaluate information on whether job creation in target firms comes at the expense of other firms, or via net job creation. The spillover can be also positive, for example by increasing activity and growth in some areas.

However, is not easy to obtain direct estimates net of spillovers (see De Castris, Pellegrini, 2012). Cerqua and Pellegrini (2017) presented an econometric approach where the identification of spillover is based on specific assumptions concerning the spatial and economic dimension of the links (or interference) among firms. In this paper we adopt another approach, one often used in the literature based on the territorial aggregation: firstly,

[1] The model can be interpreted as a causal model based on a DID (considering long differences) estimator using a continuous intensity variable. There are several examples in the literature, for instance Bondonio and Greenbaum (2006). However, the absence of pre-treatment data prevents us from testing the «parallel trends» hypothesis. Therefore, caution in interpreting the results is necessary, even if the endogeneity problem is tackled using an IV approach.

data are aggregated at the area level in order to capture both direct effects and spillovers among firms within areas. (Bondonio, 2002; Criscuolo *et al.*, 2016). Area-level outcome is regressed on policy intensity conditioned on covariates, capturing the overall effect of the policy; secondly, the spillovers among neighboring areas are captured by a Durbin spatial model, using first order spatial lag of the dependent variable and the exogenous variables in the same sector. This approach makes it possible to decompose the impact of CGF into different components: the direct effect, i.e. the effect on the area where the guaranteed firms are located, and the indirect effect linked to the positive or negative spatial spillovers coming from the neighbouring areas. The assumed restrictions are that only first-level spatial lags and only within-sector spillovers are not negligible.

Using this approach, the identification of the effects depends on the importance of the policy program with respect to confounding factors. In several regional programs the economic weight of the group of subsidized firms is negligible compared to the regional economy, so that the impact of the policy becomes virtually indistinguishable from the changes produced by different prominent confounding factors. Bondonio (2002) suggests that the geographic unit on which to measure the results should represent an economic dimension as close as possible to the financial measure of business activity stimulated by the policies. Therefore, local policies require a local geographic dimension for the analysis, whereas national politics require the national one.

To overcome these difficulties, we adopted a composite evaluation strategy. We chose the province administrative unit (NUT3 level) as the relevant territorial dimension. Moreover, the «provincial» dimension is the minimum unit for which robust statistical information is available but also includes relevant territorial effects. Sectoral and dimensional heterogeneity is the major confounding factor, and the analysis was conditioned on it. The policy dimension can be captured by different variables. We considered various policy variables and outcomes in order to increase the robustness of the econometric analysis.

The presence of endogeneity of the policy variable is reduced by the adoption of different econometric strategies based on the IV approach. One strategy is based on the Bartik instrument, which uses the national shock re-weighted at the provincial level with the sectorial shares. The variable is often used as an instrument in the literature, for instance in Moretti (2010). The use of the Bartik instrument in a context very similar to that of our paper is in Greenstone, Mas and Nguyen (2017). Using the Bartik instrument is equivalent to using local industry shares as instruments: see for instance Goldsmith-Pinkham, Sorkin and Swift (2018). This paper argues that the Bartik design is based on randomness of sectoral shares across locations. In our example, the CGF affects only a tiny share of the firms in the provinces, so that the impact on the sector share is very low. A suggested test is to regress the worker growth rate multiplied by the sector shares to provincial

dummies. Considering all the provinces together, the p-value of the F test of the regression is (marginally) higher than the 5% threshold. However, if we split the sample regression considering only the Northern provinces and only the Southern provinces, in both cases the p-value is higher than 20% and we cannot reject the null hypothesis of randomness of sectoral shares across provinces. The other strategy for the IV approach uses growth in not eligible sectors as instrument.

The spatial spillovers were captured by a Durbin spatial model that included the spatially lagged value of the dependent variable. Moreover, using the assumption that the spillovers, within and outside the province, are generated in the same production sector, we inserted into the model also the value of the dependent variable for firms of different sizes but in the same sector. Considering spatial spillovers, the model included also the spatially lagged value of this variable. The econometric models that we used in the analysis are fully described in section 5.

4. Data

The empirical analysis was based on a data set constructed in order to match three different sources of data: information on companies that had used the Guarantee Fund; demographic information on firms (from the National Statistical Institute archive on enterprises, which provides information on sector, size and geographical location of firms); and the bank loans by provinces made available by the Bank of Italy. The purpose of the analysis was to identify the effects of the CGF on territorial growth. We considered the administrative grid of 110 Italian provinces in 2007, which corresponds to the NUTS3 spatial level in Italy, a sharp territorial disaggregation.

The sectoral composition that we adopted considered four macro-sectors (industry and energy, construction, trade and hotels, other services) and it excluded the sectors not eligible for Fund support such as agricultural, transport, metallurgy, fibers, transport, and some of smaller size. For the firm's size, we classify the firms into two groups: firms with fewer than 20 employees, and firms with between 20 and 250 employees, where 250 is the upper limit admitted by the CGF. The size of the classes was harmonized with the credit statistics classification adopted by the Bank of Italy in order to match with the CGF data set.

The data spanned the period from 2008 to 2011. We used a model of long differencing where output variables were expressed in terms of growth rates from 2008 to 2011. Our dataset consisted of 880 observations that corresponded to 110 units, the provinces, for 4 sectors, for 2 firm's sizes. Local growth was represented in the model by employment growth rate. The output variables chosen were the employment growth rate by province, sector and size class from 2008 to 2011.

Table 1: Descriptive statistics of policy variables and dependent variable

Policy variables	Mean	Minimum	Maximum
Guarantees by employee (thousands euros)	286	0	2342
Funding by employee (thousands euros)	494	0	4164
Share of guaranteed firms (%)	2.98	0	21.4
Dependent variable			
Employment growth rate (%)	-11.25	-68.72	53.51

The policy intervention was captured by three different variables: the maximum value of the guarantees that can be granted; the level of funding descendants from the collateral; the firms that had benefited from these guarantees. Since the provinces have different sizes, it was necessary to standardize the variables: the first two were normalized with the number of employees by sector, size and province, the last with the number of firms.

For all three variables we considered the cumulative sum for the years 2009-2010-2011, divided by the cumulative sum of employees in the same period, in order to obtain an estimate of the average of the intervention of the Fund in the period considered. The treatment's variable was continuous because it represented the treatment intensity. This enabled us to estimate the elasticity of growth rate by the intensity of the aid in the province.

Table 1 presents the average values of the policy variables and output variable. These values refer to the 880 observations, classified across three variables, province, size and sector. As shown in the table, in the sample there are on average about 270,000 guarantees per employee corresponding to slightly less than double in terms of funding. Moreover, firms are guaranteed by the Fund on average for about 3% of the total (taking into account the industry and the allowable size). The employees' growth rate in the period is negative, amounting to about 11% in terms of employees, -7% in terms of firms.

We considered different covariates to describe the structural dimension of provinces. Province, sectoral and size effects were controlled by dummy variables and interactions. We also added a variable on the share of direct guarantees on the total, to model the operational procedure of the fund.

A key aspect of the analysis concerned the endogeneity of the policy variables: we could not exclude reverse causality, i.e. that in a growing region the demand for guarantees is higher because a higher number of firms ask for credit. To take this bias into account, at least partially, we used two joint strategies, based on IV, using instruments not linked to regional shocks due to the policy variables. One approach uses employees' growth at national level, by sector and size as instrument (the Bartik instrument). The variable is re-weighted at the provincial level with the sectoral share of workers (in

2008). In this way one obtains an indicator of demand related to exogenous shock nationwide that can take account of the different composition of the economy at the provincial level. This indicator was used not only as exogenous variable but also to decompose the provincial growth (in terms of size and industry) into the national component and the idiosyncratic component.

The other approach uses the employees' growth in sectors not eligible for guarantee by the CGF as instrument. The analysis considered the sectors of transport, equipment manufacture, metallurgy, financial services, transportation services, while the excluded sectors were agriculture and the public sector. This variable could help eliminate shock at provincial level that also affected the policy variables.

The spatial analysis was carried out using a spatial matrix W describing the presence of contiguity between provinces. We assumed that two provinces are contiguous if they are adjacent on at least one edge. It is a usual row-standardized spatial matrix, where the row sum is equal to one (Elhorst, 2014).

5. The evaluation model

The econometric basis for the evaluation of territorial effects was a Diff-in-Diffs model designed to capture «long» differences (differencing across several years). However, the policy variable was continuous, so that the model compared and identified the effects of the CGF for different levels of «treatment», that is, for the different weights of interventions in the province.

The basic model was constructed as follows:

$$\Delta Y_{ijr} = \alpha + \beta_1 P_{ijr} + \beta_2 X_{ijr} + \beta_3 D_i + \beta_4 D_j + \beta_5 D_r + \beta_6 Int_{ij} + \varepsilon_{ijr} \qquad [1]$$

where each variable is defined by province (r), sector (j) and size (i):
ΔY_{ijr} is the outcome growth rate variable;
P_{ijr} is the policy variable;
D_r is the provincial dummy;
D_j is the sector dummy;
D_i is the firm size dummy;
$Int_{ij} = D_i * D_j$ is the interaction variable between sector and size;
ε_{ijr} = error variable;
X_{ijr} = other covariates: share of direct guarantees, provincial average interest rate of CGF operations.

The endogeneity of the policy variable requires use of an approach different from OLS. We adopted a 2SLS approach, using as exogenous variables the national re-weighted growth rate of employees (Bartik instrument) and provincial sectoral growth rate of employees for sectors not admissible in the Fund as instruments.

The outcome variable was the employment growth rate in the period 2008-2011. The models were estimated considering three different policy variables (maximum guarantees by employee, maximum funding by employee, share of guaranteed firms, all normalized, in the same period). We used both IV and OLS methods, for robustness analysis. The introduction of the spatial lag of the dependent variable changes the equation in a SAR model, estimated with a GMM approach[2], in order to have a statistically correct estimation of territorial effects of the CGF.

The hypothesis that we used in the spatial version of the model was that such spillovers occur only within the same sector. Therefore, we augmented the model by using spillovers between different sizes and between neighboring provinces but in the same sector.

Hence the model was augmented as follows:

$$\Delta Y_{ijr} = \alpha + \beta_1 P_{ijr} + \beta_2 X_{ijr} + \beta_3 D_i + \beta_4 D_j + \beta_5 D_r + \beta_6 Int_{ij} + \beta_7 W\Delta Y_{ijr} + \beta_8 W\Delta Y_{-ijr} + \beta_9 \Delta Y_{-ijr} + \varepsilon_{ijr} \quad [2]$$

where:

W is the contiguity row-standardized spatial weights matrix;

$W\Delta Y_{ijr}$ is the generic element of spatial lag of ΔY (spatial spillover). Each element represents the outcome growth rate in the neighboring province (r), the same sector (j) and the same size (i);

ΔY_{ijr} is the generic element of the outcome growth rate in the same province and sector but of different size ($-i$) (size spillover);

$W\Delta Y_{-ijr}$ is the generic element of the outcome growth rate in the neighboring province, the same sector but of different size ($-i$) (size and spatial spillover).

In this model, β_1 is the direct effects due to subsidies. The total impact β_T is estimated considering also the policy spillover $(I - \beta_7 W)^{-1}\beta_1 P$, where the additional effect $(\beta_T - \beta_1)$ is given by spillover from neighbouring areas due to the indirect impact of the subsidy on them[3].

Note that LeSage and Pace (2009) propose reporting two different summary indicators: for the direct effect, the average of the diagonal elements of the matrix on the right-hand side of (2), and for the indirect effect, the

[2] We used the Spivreg routine in Stata, restricting rho to 0.

[3] However, the total impact β_T considers the impact on firms within the same sector and size, that is, the impact of the policy only on a specific kind of firm. If one wants to consider also the impact of the policy on firms in the same sector but different size one should add a different variable $W\Delta P_{-ijr}$, i.e. a policy variable in the neighbouring province, the same sector but different size. Moreover, one should add also the impact from spillovers coming from different areas. Therefore, one should add in the model W^2P_{ijr}, that is, a policy variable that affects the neighbouring province, the same sector and the same size. However, in the enriched model it is very difficult to identify the overall effects of the policy, because it brings together policies adopted in different areas for firms of different sizes. For this reason, in this paper we present results of model (2), considering only the direct or indirect effects by area, sector and size.

average of either the row sums or the column sums of the off-diagonal elements of that matrix.

Generally, the indirect effect is interpreted as the impact of changing a particular element of an exogenous variable on the dependent variable of all other units, which corresponds to the average column effect (Elhorst, 2014). This indicator is also presented in the description of our results.

6. Results

The results are summarized in Tables 2-3, which show the coefficients, their significance and the explanatory power of the various models. In Table 2 the results of the OLS model (without spillover effects) for employment growth are presented. In a previous model, the variable «average interest rate» was considered, but it was not statistically significant and therefore excluded in the chosen specification.

Bondonio's criticism (2002) concerning the irrelevance of territorial intervention can be applied to CGF action. However, in our specification the policy variables have a reasonable overall statistical significance and the expected sign. Considering that the subsidized loans from the CGF cover on average only 3% of total loans by area, and subsidized firms are on average only 0.5% of the total firms in the area, the relevance of the results can be appreciated.

The significant effects are mainly related to the funding per employee indicator, which is definitely more correlated to growth than the other policy variables. Also the effect of the guarantees per employee is slightly significant.

Considering the model with spatial spillovers and estimated by IV (Table 3), impacts are higher and often statistically more significant that in OLS models. The presence of spatial spillover is clear and highly statistically significant in all the three models. Considering endogeneity, the impacts of the CGF is stronger: a possible explanation is that the results are mainly related to the long period of negative growth that depressed the use of the instrument. Indeed, the period considered in the paper was characterized by the beginning of a severe national recession. The growth rates are usually negative. Therefore, we expected that the OLS would be downward biased. However, the differences are large, and this result requires further analysis using a longer period.

Considering the results and the average value of the variables involved, we estimate that a 10% increase per employee of collateral would result in an increase of approximately 1% of the growth rate of employees in the province. Therefore, the impact is positive, significant, but overall modest.

However, the direct and indirect effects' estimates by the procedure proposed by LeSage and Pace (2009) show that the indirect effects are positive but low, around 5% of the direct effect (Table 4). This was not unexpected, since the territorial unit that we used was quite large and comprised several labor markets.

Table 2: Model with policy effects, OLS estimates, no spatial spillovers. *Dependent variable*: provincial employment growth rate

Variables	(1)	(2)	(3)
Funding by employee	33.962***		
	(11.610)		
Guarantees by employee		35.565*	
		(18.693)	
Share of guaranteed firms			0.229
			(0.190)
Firm size (dummy)	0.042**	0.048***	0.044**
	(0.017)	(0.017)	(0.020)
Direct guarantee (dummy)	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)
Construction (dummy)	-0.095***	-0.099***	-0.103***
	(0.016)	(0.016)	(0.016)
Trade and hotel (dummy)	0.072***	0.069***	0.066***
	(0.017)	(0.017)	(0.017)
Other services (dummy)	0.038**	0.033**	0.028*
	(0.016)	(0.016)	(0.016)
Size * construction (dummy)	-0.053**	-0.050**	-0.044*
	(0.023)	(0.023)	(0.023)
Size * trade and hotel (dummy)	-0.051**	-0.050**	-0.044*
	(0.023)	(0.024)	(0.023)
Size * other services (dummy)	-0.058**	-0.061***	-0.060**
	(0.023)	(0.023)	(0.023)
Provincial dummies	yes	yes	yes
Constant	-0.200***	-0.195***	-0.194***
	(0.049)	(0.049)	(0.049)
Observations	880	880	880
R-squared	0.374	0.369	0.368

Legend: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3: Model with policy effects, GS2SLS estimates, with spatial spillovers. *Dependent variable*: provincial employees' growth. *Instruments*: National re-weighted employment growth rate (Bartik instrument); Spatial lag of the policy variable

Variables	(1)	(2)	(3)
Constant	-0.056	-0.034	-0.044
	(0.045)	(0.043)	(0.045)
Lambda (β_7) (spatial spillover)	0.065***	0.066***	0.064***
	(0.014)	(0.014)	(0.014)
Funding by employee (thousands euros)	33.997**		
	(13.979)		
Guarantees by employee (thousands euros)		37.219*	
		(21.958)	
Share of guaranteed firms (%)			0.371*
			(0.225)
Direct guarantee share	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)
Size spillover	-0.141***	-0.140***	-0.138***
	(0.034)	(0.034)	(0.034)
Size and spatial spillover	0.324***	0.327***	0.328***
	(0.072)	(0.072)	(0.072)
Firm size (dummy)	-0.020	-0.025	-0.014
	(0.018)	(0.018)	(0.021)
Construction (dummy)	-0.007	-0.008	-0.013
	(0.023)	(0.023)	(0.023)
Trade and hotel (dummy)	0.023	0.019	0.018
	(0.018)	(0.018)	(0.018)
Other services (dummy)	0.021	0.016	0.013
	(0.016)	(0.016)	(0.015)
Size * construction (dummy)	-0.057***	-0.054**	-0.048**
	(0.021)	(0.021)	(0.021)
Size * trade and hotel (dummy)	-0.040*	-0.039*	-0.033
	(0.022)	(0.022)	(0.022)
Size * other services (dummy)	-0.030	-0.032	-0.028
	(0.023)	(0.023)	(0.024)
Provincial dummies	yes	yes	yes
Observations	880	880	880

Table 4: Marginal effects

Treatment variable	Direct effects	Indirect effects
Funding per employee	40.65	2.54
Guarantees per employee	48.64	4.68
Share of guaranteed firms	0.68	0.13

7. Concluding remarks

Policy makers are interested in evaluating the net impact of the instruments on a specific area. Even in the case of the CGF for SMEs, where the link between instrument and territorial dynamics appears weaker, we have shown the existence of positive net effects at the local level of the increase in loans related to the CGF operations. The existence of such effects is not obvious: it is often discussed whether the operation of the CGF was in fact likely to transfer at least part of the advantage enjoyed by banks to firms. This would justify the high public contributions to the CGF.

The analysis was conducted at the provincial level, an adequate territorial dimension for the effects of the Fund. When using this grid, the impact of the CGF covered on average only 3% of companies and 0.5% of loans. This, however, had still created leverage effects in the territory, apparently by stimulating productive activity and investment and thus growth at local level. The results obtained, using a variety of analyses and estimators, generally indicate a positive, statistically significant, although modest, effect of the CGF. On average, an increase of 10% of the guarantees would be reflected in an average 1% increase in the employment growth rate. A more than 10% increase of the funding would have a double effect, a 2% growth rate of employees.

These results depend on the ability of models to isolate the endogenous component that characterizes the instrument with respect to the territorial growth. Several attempts have been made in this direction in our paper, although caution in interpreting the results is still necessary, given the need for further study in this regard, especially in order to improve the causal interpretation of the model.

To conclude, the CGF appears to be a tool useful not only to overcome the imperfections in the credit market but also to provide enterprises with the financial resources necessary to develop the local economy. However, on its own it is not enough to stimulate stable local growth. It must be accompanied by measures designed to support long-lasting local development, like incentives for innovation and human capital development.

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