Mafia and Public Spending: Evidence on the Fiscal Multiplier from a Quasi-experiment

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This paper

- We estimate the effect of public spending cuts on output at local level (local fiscal multiplier).

  This evidence is of interest to investigate:

- the efficacy of fiscal policy to counter area-specific recessionary shocks;
- the geographical and distributional consequences of crises that may force local administrations to undertake budget cuts of different intensities.

This paper (cont.)

- We provide evidence on output multiplier effects of government purchases at a local level, relying on a quasi-experiment.
- We instrument spending by exploiting an Italian law, which causes sudden, large and exogenous spending contractions.
- We estimate the output multiplier controlling for both common cyclical movements and common policy impulses at national level.
- We are able to estimate multipliers of local spending independent of the implied adjustment in taxes.

Preview of results

- The one-year impact spending multiplier is estimated about 1.2, and significantly larger than zero.
- Under the maintained hypothesis that lagged values of spending are exogenous to current value added, dynamic effects raise our point estimate to around 1.8.
- However, in our preferred model specification, we cannot reject the hypothesis that the multiplier is less than, or equal to one at standard confidence levels.

Local fiscal multiplier literature

- Looking at state-level relative to national military spending in the U.S., Nakamura and Steinsson (2011) estimate multipliers in the range 1.4-1.9.
- Serrato and Wingender (2010) use fund reallocation across U.S. counties, due to changes in the methodology underlying estimates of local populations (the multiplier is 1.88).
- Shoag (2010) exploits the idiosyncratic component of the returns on defined-benefit pension plans managed by U.S. states (the multiplier is 2.12).
- Fishback and Kachanovskaya (2010) exploit a swing voting measure, which varies primarily across states, as an instrument for government grants during the New Deal (the multiplier for public works grant is 1.67).

The empirical model

$$\frac{y_{i,t} - y_{i,t-1}}{y_{i,t-1}} = \alpha_i + \lambda_t + \beta \frac{g_{i,t} - g_{i,t-1}}{y_{i,t-1}} + \gamma X_{i,t} + v_{i,t}$$

$$Y_{i,t} = \alpha_i + \lambda_t + \beta G_{i,t} + \gamma X_{i,t} + v_{i,t}$$

where for each province i of the 95 Italian provinces:

- y_i is per capita value added
- g_i is the per capita infrastructure investment spending
- λ_t is a year fixed effect
- α_i is a province fixed effect
- $X_{i,t}$ denotes covariates

The coefficient β measures the contemporaneous government spending multiplier.

Instrumenting Changes in Public Spending

- Despite advantages of using local information, OLS estimates of local spending multipliers are not shielded from two standard criticisms:
  1. Spending on infrastructures is usually planned some years before it actually takes place (anticipations effects).
  2. The government may have systematically allocated funds in response to local developments.
- To address these problems, we need a good instrument for unexpected variations in public spending exogenous to local economic conditions.
- We rely on a specific law by the Italian government, mandating compulsory administration of local municipalities on evidence of mafia infiltration.

The institutional setting

- Articles 416-bis and 416-ter target the use of intimidation, associative ties, and omertà to acquire direct or indirect control of otherwise legal economic activities, especially in relation to public investment and the provision of public services.
- To pursue their goals, Mafia-type associations have specific interests in influencing the results of electoral competition, and obtain effective control over public tenders.
- Public works under the control of local administration have become one of the most lucrative businesses for mafia associations, generating profits comparable to those from extortions and selling drugs (see Relazione, 2000)

The institutional setting (cont.)

- The Italian Legislator gave the central government the power to remove elected local officials in a city council on evidence that their decisions were determined or influenced by the mafias (D.L. 31/05/1991 n. 164).
- Upon their removal, the central government appoints three non-elected, external commissioners, ruling the municipality for a period of 18 months.
- The new tool has been extensively used in regions where criminal infiltration in the territory and the institutions is long-established and common knowledge.

The institutional setting (cont.)

Table: Council Dismissals because of Mafia Infiltration

Napoli	48	Reggio C.	37	Palermo	23	Bari	5
Caserta	31	Catanzaro	8	Catania	9	Lecce	2
Salerno	6	Vibo V.	12	Trapani	6		
Avellino	4	Crotone	3	Caltanisetta	6		
Benevento	1	Cosenza	2	Agrigento	7		
				Messina	3		
				Ragusa	1		
Campania	90	Calabria	62	Sicily	55	Puglia	7

Note: The table reports the number of council dismissals because of mafia infiltration during 1991-2012(July), by province, within the regions of Calabria, Campania, Puglia and Sicily. Only seven council dismissals occurred in the rest of Italy during the same period.

An instrument "one can't refuse"

- The first acts by the external administrators appointed by the central government consists of suspending financial flows into local public work and investment projects.
- Public work and projects are started again only after investigation and scrutiny of previous tender procedures and decisions.
- In our sample (1990-99), we have 110 cases of city councils put under compulsory administrations. Aggregating them by province, we obtain 47 observations.

An instrument "one can't refuse" (cont.)

Investment Spending after Council Dismissal

	(1)	(2)	(3)	(4)	(5)	(6)
Difference	-19.65***	-0.46*	-23.67***	-0.49*	-4.72	-0.04
	[5.36]	[0.19]	[7.12]	[0.26]	[5.29]	[0.18]
N	950	950	180	180	905	905

Note: The table reports one-side mean difference test results for investment changes between treatment and control groups, columns (1)-(4), and different control groups, columns (5)-(6). "Difference" reports the average investment change in the treatment group less the average investment change in the control group. Data are annual from 1990 to 1999 at Italian province level. The standard error is reported in brackets; *$p < 0.05$, **$p < 0.01$, *** $p < 0.001$.

Randomness of council dismissals

- Is the instrument variation systematically related to local economic activity?
- The procedure leading to a dismissal of a city council because of mafia infiltration is started by the *prefetto* on police reports on the activities of the mafia in the municipality.
- The police evidence is produced in the course of investigations on crimes often unrelated to the control of local public work.

Randomness of council dismissals (cont.)

	> 0	< 0	> 0 or < 0
$t-1$ & $t-2$	$1/3$	$1/6$	$1/2$
$t-1$ & $t-2$ & $t-3$	$1/9$	0	$8/9$

Note: For two and three years before council dismissals happened, the table reports the proportion of cases with provincial growth rates always above the national average (column labeled with > 0), always below the national average (column labeled with < 0), without a constant sign (last column).

Randomness of council dismissals (cont.)

- In addition, we compare growth rates of "treated provinces" prior to first dismissal with growth rates of the other provinces, by running the following regression:

$$Y_{i,t} = d_0 + d_1 D_{i,t} + d_2 t + d_3 \left(t * D_{i,t}\right) + \psi_{i,t},$$

  where t is a time trend and $D_{i,t}$ is a dummy variable with 1 for any province $\times$ year observation before the first episode of council dismissal and 0 otherwise.
- d_3 is not statistically different from zero — confirming the absence of a differential trend in growth rates before council dismissals.

The instruments

- The first instrument ($CDS1$), equals the number of municipalities put under compulsory administration, provided that the official decree is published in the first semester of the year.
- The second instrument ($CDS2$) equals the number of municipalities put under compulsory administration in any given year, if the average number of days spent in such state is less than 180, and zero otherwise.
- In our baseline model, we instrument $G_{i,t}$ entering S1 contemporaneously and S2 lagged one period. Thus, the first stage regression of our baseline specification is

$$G_{i,t} = \alpha_i + \lambda_t + \delta_1 \text{CDS1}_{i,t} + \delta_2 \text{CDS2}_{i,t-1} + \gamma X_{i,t} + e_{i,t}$$

- The estimates of the coefficients of both instruments are always negative, as expected, and highly statistically significant.

Results: impact and dynamic multiplier

	(1)	(2)	(3)	(4)	(5)
G(t)	1.17*	1.21*	1.29*	1.42*	1.44**
	[0.55]	[0.53]	[0.51]	[0.56]	[0.54]
Y(t-1)		-0.12	-0.13*	-0.12	-0.16**
		[0.06]	[0.06]	[0.07]	[0.06]
Y(t-2)		-0.01	-0.00	-0.00	-0.02
		[0.05]	[0.05]	[0.05]	[0.05]
CD(t-2)			-0.30		-0.19
			[0.17]		[0.20]
CD(t-3)			-0.08		-0.07
			[0.16]		[0.17]
G(t-1)					0.74**
					[0.25]
G(t-2)					0.19
					[0.11]
Year fixed effect	YES	YES	YES	YES	YES
Province fixed effect	YES	YES	YES	YES	YES
Police activity outcome	YES	YES	YES	YES	YES
Unemployment proxies	YES	YES	YES	YES	YES
Number of instruments	2	2	2	4	2
First stage F-test	9.20	9.78	10.48	6.35	9.84
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N	950	950	950	950	950

Results: impact and dynamic multiplier (cont.)

- The impact coefficient is 1.44, but the net multiplier effect of $G(t)$ is actually about 1.24.
- The coefficient of the first lag is statistically and economically significant, with a point estimate which is about one half that of the impact coefficient.
- The point estimate of the overall multiplier is as high as 1.87. Nonetheless, we are not able to reject the null hypothesis $\beta \leqslant 1$in favor of $\beta > 1$

Exclusion restriction

- The key question is whether council dismissals may be detrimental for economic activity via other channels.
- A first channel works through the direct impact on economic activity of variations in mob activities occurring in conjunction with a council dismissal.
- A second channel works through changes in the output of the local bureaucracy in a regime of compulsory administration.

Downsizing of mafia activities

- The effect of policy investigation is ambiguous in the short run:
  - it may also induce the mafia to downsize or close down activities that translate into immediate output losses
  - it may provide immediate benefits from deterrence of political corruption and crimes such as extortions, which act like a “tax” on firms and households
- We control for this channel relying on measures of the outcome of police investigation at local level.

Downsizing of mafia activities (cont.)

- Do our controls provide a good proxy?
- Yes! Our estimates of the spending multiplier fall when we drop these controls.
  - Our controls are correlated with mafia activities.
  - The legal action against the mafia tends to have a direct, positive impact on output.
- This evidence is at odds with concerns that a “mafia activity channel”(when not appropriately controlled for) would necessarily induce an upward bias in estimating local multipliers.

Downsizing of mafia activities (cont.)

	(1)	(2)	(3)	(4)	(5)
G(t)	1.17*	1.42**	1.46**	1.44**	1.45**
	[0.50]	[0.52]	[0.55]	[0.54]	[0.53]
Y(t-1)	-0.14*	-0.16**	-0.16**	-0.16**	-0.16**
	[0.06]	[0.06]	[0.06]	[0.06]	[0.06]
Y(t-2)	-0.02	-0.02	-0.01	-0.02	-0.01
	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]
G(t-1)	0.62**	0.73**	0.75**	0.74**	0.75**
	[0.23]	[0.25]	[0.26]	[0.25]	[0.25]
G(t-2)	0.15	0.18	0.19	0.19	0.19
	[0.10]	[0.11]	[0.12]	[0.11]	[0.11]
Resignation(t)		0.01			
		[0.05]			
Resignation(t-1)		0.00			
		[0.06]			
Election(t)			0.05		
			[0.11]		
Election(t-1)			-0.03		
			[0.10]		
Budget-No confidence vote(t)				0.05	
				[0.17]	
Budget-No confidence vote(t-1)				-0.03	
				[0.16]	
Total Not-Mafia City CD(t)					0.03
					[0.04]
Total Not-Mafia City CD(t-1)					-0.30
					[0.05]
Year fixed effect	YES	YES	YES	YES	YES
Province fixed effect	YES	YES	YES	YES	YES
Police activity outcome	NO	YES	YES	YES	YES
Unemployment proxies	YES	YES	YES	YES	YES
Excluded instruments F-statistic	9.31	11.00	9.48	9.97	10.44
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N	950	950	950	950	950

Do council dismissals per se affect output?

- City councils may be dismissed also for reasons different from mafia infiltration, and without necessarily implying a freezing of spending on public work.
- If council dismissals are *per se* shocks to government, they should have a negative effect on output even when they do not imply a contraction in spending.
- Evidence does not support this possibility

Do council dismissals per se affect output? (cont.)

	(1)	(2)	(3)	(4)	(5)
G(t)	1.17*	1.42**	1.46**	1.44**	1.45**
	[0.50]	[0.52]	[0.55]	[0.54]	[0.53]
Y(t-1)	-0.14*	-0.16**	-0.16**	-0.16**	-0.16**
	[0.06]	[0.06]	[0.06]	[0.06]	[0.06]
Y(t-2)	-0.02	-0.02	-0.01	-0.02	-0.01
	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]
G(t-1)	0.62**	0.73**	0.75**	0.74**	0.75**
	[0.23]	[0.25]	[0.26]	[0.25]	[0.25]
G(t-2)	0.15	0.18	0.19	0.19	0.19
	[0.10]	[0.11]	[0.12]	[0.11]	[0.11]
Resignation(t)		0.01			
		[0.05]			
Resignation(t-1)		0.00			
		[0.06]			
Election(t)			0.05		
			[0.11]		
Election(t-1)			-0.03		
			[0.10]		
Budget-No confidence vote(t)				0.05	
				[0.17]	
Budget-No confidence vote(t-1)				-0.03	
				[0.16]	
Total Not-Mafia City CD(t)					0.03
					[0.04]
Total Not-Mafia City CD(t-1)					-0.30
					[0.05]
Year fixed effect	YES	YES	YES	YES	YES
Province fixed effect	YES	YES	YES	YES	YES
Police activity outcome	NO	YES	YES	YES	YES
Unemployment proxies	YES	YES	YES	YES	YES
Excluded instruments F-statistic	9.31	11.00	9.48	9.97	10.44
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N	950	950	950	950	950

Further results: cross-boarder effects

- Cross-border effects of public spending, if any, can have a vastly different nature.

1. Since our provinces are very open economies, part of the contraction in demand in one municipality may "leak" into nearby areas (positive correlation).
2. In response to a localized spending shock, it is possible that production factors relocate (negative correlation).

Further results: cross-boarder effects (cont.)

- We carry out an analysis of cross border effects of local spending in two ways. First, we estimate cross-province effects within each region by extending the set of regressors. Second, we aggregate observations by groups of 2/3 provinces at a time.
- We consider the variable $SG_{i,t} = \frac{Sg_{i,t} - Sg_{i,t-1}}{Sy_{i,t-1}}$, where $Sg_{i,t}$ is the per-capita investment across provinces which are part of the same region excluding province i itself, and the variable $Sy_{i,t-1}$ is accordingly defined.
- We then enter $SG_{i,t-1}$ interacted with $G_{i,t-1}$ to allow for the possibility that the effect of local spending reflects either complementarity between spending in adjacent areas or substitutability.

Further results: cross-boarder effects (cont.)

- The coefficients of the 'spillover' variable and its lag are not significantly different from zero.
- The coefficient of the interaction term is marginally significant, with a positive sign — lending support to the hypothesis of complementarity.
- Aggregating either two or three adjacent provinces in a single unit, the coefficients attached to $G_{i,t}$ and $G_{i,t-1}$ increase a bit — providing further evidence that, if anything, the spillover effects end up adding to the local effect of spending.

Further results: cross-boarder effects (cont.)

	(1)	(2)	(3)
G(t)	1.37*	1.36**	1.68**
	[0.64]	[0.52]	[0.54]
Y(t-1)	-0.17**	-0.16**	-0.19**
	[0.06]	[0.06]	[0.06]
Y(t-2)	-0.01	-0.01	-0.00
	[0.05]	[0.05]	[0.05]
CD(t-2)	-0.19	-0.20	-0.17
	[0.20]	[0.19]	[0.17]
CD(t-3)	-0.07	-0.07	-0.13
	[0.16]	[0.17]	[0.13]
G(t-1)	0.70*	0.74**	0.92**
	[0.29]	[0.24]	[0.28]
G(t-2)	0.17	0.19	0.23
	[0.11]	[0.11]	[0.18]
SG(t)	0.07		
	[0.26]		
SG(t-1)	0.24		
	[0.22]		
G(t-1)*SG(t-1)		0.17	
		[0.10]	
Year fixed effect	YES	YES	YES
Province fixed effect	YES	YES	YES
Police activity outcome	YES	YES	YES
Unemployment proxies	YES	YES	YES
Excluded instruments F-statistic	7.05	9.51	16.88
(p-value)	(0.00)	(0.00)	(0.00)
N	950	950	410

Further results: cross-boarder effects

	NA	CE	PA	CT	SA	BA	RC
G(t)	1.50**	1.26*	1.40*	1.27*	1.40*	1.43**	1.28**
	[0.58]	[0.50]	[0.56]	[0.59]	[0.55]	[0.53]	[0.49]
Y(t-1)	-0.16**	-0.16**	-0.16*	-0.16**	-0.16*	-0.16**	-0.13*
	[0.06]	[0.06]	[0.06]	[0.06]	[0.06]	[0.06]	[0.06]
Y(t-2)	-0.01	-0.02	-0.02	-0.02	-0.02	-0.01	-0.04
	[0.06]	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]
CD(t-2)	-0.11	-0.27	-0.16	-0.12	-0.17	-0.17	-0.31
	[0.29]	[0.19]	[0.21]	[0.19]	[0.21]	[0.21]	[0.17]
CD(t-3)	-0.09	-0.11	-0.05	-0.02	-0.10	-0.06	-0.04
	[0.25]	[0.19]	[0.17]	[0.16]	[0.18]	[0.17]	[0.15]
G(t-1)	0.77**	0.67**	0.73**	0.67*	0.73**	0.74**	0.68**
	[0.27]	[0.24]	[0.25]	[0.28]	[0.26]	[0.25]	[0.23]
G(t-2)	0.19	0.16	0.18	0.16	0.18	0.18	0.16
	[0.12]	[0.11]	[0.11]	[0.11]	[0.11]	[0.11]	[0.10]
Year effect	YES	YES	YES	YES	YES	YES	YES
Province effect	YES	YES	YES	YES	YES	YES	YES
Police outcome	YES	YES	YES	YES	YES	YES	YES
Unemp. proxies	YES	YES	YES	YES	YES	YES	YES
Excluded instruments F-statistic	10.94	14.21	8.01	8.94	7.91	9.78	7.97
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N	940	940	940	940	940	940	940

Further results

	Drop λ_t	South	Drop α_i	OLS
G(t)	1.78**	1.45**	1.54**	0.20**
	[0.56]	[0.54]	[0.54]	[0.06]
Y(t-1)	-0.11	-0.29**	-0.07	-0.12*
	[0.06]	[0.10]	[0.06]	[0.05]
Y(t-2)	0.06	-0.00	0.06	-0.03
	[0.06]	[0.09]	[0.06]	[0.05]
CD(t-2)	-0.09	-0.21	-0.20	-0.28
	[0.19]	[0.19]	[0.20]	[0.15]
CD(t-3)	0.06	-0.02	-0.07	-0.14
	[0.21]	[0.16]	[0.17]	[0.14]
G(t-1)	0.75*	0.76**	0.71**	0.23***
	[0.30]	[0.25]	[0.25]	[0.07]
G(t-2)	0.12	0.15	0.13	0.03
	[0.12]	[0.12]	[0.10]	[0.06]
Year fixed effect	YES	NO	YES	YES
Province fixed effect	YES	YES	NO	YES
Police activity outcome	YES	YES	YES	YES
Unemployment proxies	YES	YES	YES	YES
Excluded instruments F-statistic	11.74	8.91	10.22	
(p-value)	(0.00)	(0.00)	(0.00)	
N	950	340	950	950

Conclusions

- We have contributed evidence on the output effects of public spending at local level, by looking at episodes of sharp contractions in infrastructure expenditure.
- Our results point to non-negligible short-run consequences on economic activity: the estimated local multiplier is 1.2 on impact, and 1.8 including dynamic effects over two years.
- Our estimates suggest that differences in the intensity of the upfront retrenchment at local level can be expected to translate into significant geographical variation in economic activity.
- Local multipliers naturally shed light on the transmission of regional fiscal policy in a currency union.