Incentive Schemes for Local Government: Theory and Evidence from Comprehensive Performance Assessment in England

Online Appendix

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1. Robustness Tests Reported in 5.D of the "Incentive Schemes for Local Government: Theory and Evidence from Comprehensive Performance Assessment in England"

1.1. Estimation with Linear Time Trends for Different Types of Local Authority

Our first robustness check is designed as follows. We included among the regressors a linear trend specific to each type of local authority (London borough, Metropolitan districts, Counties and Unitary authorities) treating Welsh Unitary authorities as a different type. By doing so the baseline empirical model becomes

$$Y_{it} = \alpha(CPA_t \times D_i) + \beta' \mathbf{X}_{it} + type \times trend + \eta_t + u_i + \varepsilon_{it} \qquad (1.1)$$

The results reported in tables AA1-AA4 below show that the conclusions discussed in the paper are very robust with respect to the inclusion of the specific trend.

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Table AA1. Point estimates of the treatment effect of CPA on council tax revenues, a time trend specific to each type of local authority is included among the regressors.

Model	Tax requirement (real £ per capita) (A)	Effective council tax rate (real £ per band D equivalent dwelling) (B)	Tax requirement (% of budget requirement) (C)
FE (linear)	20.63***	17.67**	-8.43***
	(3.52)	(8.66)	(0.84)
GLM (non linear) (1)	n.a.	n.a.	-8.21***
			(1.18)
Observations	1850	1850	1810
Number of councils	170	170	170
Control variables	yes	yes	yes
Specific linear trend	yes	yes	yes
Year dummies	yes	yes	yes

Clustered standard errors in brackets. *** significant at 1%; ** significant at 5%; * significant at 10%.

Coefficient point estimates are interpreted as follows: £ per capita in column (A),

£ per dwelling in column (B), and % change in column (C).

(1) Point estimates are expressed as average partial effects

Table AA2. Point estimates of the treatment effect of CPA on service quality, a time trend specific to each type of local authority is included among the regressors.

Model	Output measures					
	Aggregated output	Aggregated output (no education)	Education	Social service	Central services	Environ-ment
FE (linear)	0.86	0.63**	2.21***	2.91**	-0.39	-2.24***
	(0.62)	(0.31)	(0.78)	(1.03)	(1.34)	(0.83)
GLM	1.82	0.86**	2.67*	3.46***	-0.84	-3.13**
(non linear) (1)	(1.54)	(0.41)	(1.48)	(0.96)	(2.76)	(1.36)
Observations	1397	1428	1669	1463	1808	1747
No. of councils	141	141	158	141	170	166
Control variables	yes	yes	yes	yes	yes	yes
Specific linear trend	yes	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes

Clustered standard errors in brackets. *** significant at 1%; ** significant at 5%; * significant at 10%. Coefficient point estimates are interpreted as percentage change in output index due to CPA.

(1)) Point estimates are expressed as average partial effects.

Table AA3. Point estimates of the treatment effect of CPA on efficiency, with a time trend specific to each type of local authority included among the regressors.

Model	Input approach		Output approach	
	no bootstrap	bootstrap	no bootstrap	bootstrap
FE (linear) (1)	0.88	-3.26	-0.18	0.28
	(2.06)	(4.30)	(1.72)	(2.25)
RE probit (non linear) (2)	1.77*	-1.66	0.30	-0.20
	(0.98)	(2.42)	(0.75)	(1.03)
Observations	1245	790	1245	748
Number of councils	141	140	141	139
Control variables	yes	yes	yes	yes
Specific linear trend	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes

Clustered standard errors in brackets. *** significant at 1%; ** significant at 5%; * significant at 10%.

(1) Coefficient point estimates are interpreted as percentage change in efficiency index due to CPA.

(2) Dependent variable is 1 in year t iff council is ranked in the upper 50th percentile of the efficiency distribution in year t. Coefficient point estimates are interpreted as percentage change in the probability of being ranked in the 50th percentile of the efficiency index distribution.

Table AA4. Heterogeneous treatment effect of CPA on taxation, aggregate output and efficiency for English LAs with low initial levels of electoral competition, with a time trend specific to each type of local authority included among the regressors.

Model	Effective council tax rate (real £ per band D equivalent dwelling)	Aggregated output	Efficiency
	(A)	(B)	(C)
FE (linear)	9.92	5.37***	9.45***
	(21.73)	(0.69)	(2.02)
Observations	1329	1101	885
Number of councils	166	137	135
Control variables	yes	yes	yes
Specific trend	yes	yes	yes
Year dummies	yes	yes	yes

Clustered standard errors in brackets. *** significant at 1%; ** significant at 5%; * significant at 10

Local authorities without a clear majority have been excluded from the sample.

1.2. Placebo Tests

Our placebo tests are designed as follows. We assume that CPA was introduced in England in each year other than 2001 and then we estimate the basic model with the inclusion of the council type-specific trend. For example, when we assume that CPA was introduced in the financial year 2003 the dummy CPA_t in the empirical model takes value 1 after 2003 (instead than after 2001), instead when we assume that CPA was introduced in 1999 he dummy CPA_t takes value 1 after 1999, and so forth.

The results of these tests are reported in Table AA5. Columns A and B show the results obtained in relation to the main variables of outputs for which we have estimated a positive impact of CPA(aggregate output with and without education). Columns C and D, instead, reports the results of the same exercise in relation to the two main variables used to measure the council tax revenues (effective tax rate and tax requirement). Finally, columns E and F, shows the results obtained for our four measures of efficiency.

Before the introduction of CPA we do not see any effect for these false experiments, after the introduction of CPA we observe some persistence of the positive impact of CPA in the revenues of council taxes that stretches until n+1 for the tax requirement and n+2 for the effective tax rate. Regarding the outputs we observe a positive effect of CPA only in n+3 in relation to the aggregate output, probably due to the introduction of the "harder test" (see Section 3 of the paper). Finally regarding our measures of efficiency, we do not register any effect for the false experiments.

Table AA5. Placebo tests.

Year in which	Output measures		Council tax		Efficiency	
we assume that CPA was introduced	Agg. output	Agg. output (no edu)	Tax requi-rement	Effec-tive tax rate	Input app-roach	Output app-raoch
	(A)	(B)	(C)	(D)	(E)	(F)
n-3	-1.541***	-0.560**	-7.951***	-19.250**	1.768	-2.313
	(0.522)	(0.242)	(2.334)	(8.415)	(2.333)	(1.870)
n-2	-0.654	0.380	-7.185***	-28.880***	-2.496	0.741
	[0.550]	(0.255)	(2.629)	(7.547)	(2.637)	(1.503)
n-1	-0.650	0.385	6.023	-6.244	-2.496	0.741
	(0.557)	(0.250)	(3.83)	(7.773)	(2.637)	(1.503)
n+1	0.612	-0.165	17.721***	41.956***	-1.491	-1.259
	(0.560)	(0.195)	(2.572)	(7.898)	(2.194)	(1.339)
n+2	0.905	-0.163	1.312	17.827***	-3.386	0.175
	(0.594)	(0.262)	(2.477)	(6.247)	(2.719)	(1.247)
n+3	0.943***	0.262	1.312	3.600	3.951	0.998
	(0.342)	(0.206)	(3.308)	(7.026)	(2.310)	(0.610)
n+4	-0.312	-0.021	-10.768**	-4.392	0.280	0.028
	(0.606)	(0.278)	(4.486)	(9.563)	(2.562)	(0.939)
Observations	1397	1428	1859	1810	1245	1229
No. of councils	141	141	170	170	141	141
Control variables	yes	yes	yes	yes	yes	yes
Specific linear trend	yes	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes

Clustered standard errors in brackets. *** significant at 1%; ** significant at 5%; * significant at 10%.