



Incentives to local public service provision: An evaluation of Italy's *Obiettivi di Servizio*

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Abstract

Set up by the Italian central government and implemented in the lagging regions, *Obiettivi di Servizio* is an innovative scheme designed to encourage local authorities to reach given targets for the provision of public services such as education, childcare and elderly care, waste management, and water supply. The paper finds that the programme was only partially successful, with considerable differences across regions and targets. An important driver of effectiveness was local institutional quality. We also find signs of displacement effects: local authorities involved in the programme might have concentrated on the targets to the detriment of other local public services.

KEYWORDS

incentives, public service provision

1 | INTRODUCTION

In this paper we carry out an econometric evaluation of an incentive scheme intended to enhance the provision of local public services (LPS). The scheme, named *Obiettivi di Servizio* (ODS), was rolled out in Italy in the 2007–2013 EU programming cycle. It is a principal-agent scheme in which central government (the principal) tries to encourage local authorities (the agents) to achieve certain goals. The scheme applies to the administrative bodies of the eight regions of southern Italy, the area of the country lagging behind. ODS involves three building blocks: targets, transparency, and money. The targets are eleven quantitative indicators set by central government and relating to the quality and quantity of some selected categories of LPS. Transparency is sought through a public assessment exercise that monitors the progress of each region towards the attainment of the targets and discloses the results to the general public. Money refers to the financial reward (€3 billion) allocated to good performing regions.

To estimate the impact of the ODS on the provision of local public services we employ a difference-in-differences (DID) approach, using as control group the twelve Italian regions of the Centre and North that did not take part in the



programme. After estimating the treatment effects, we look for region or indicator-specific factors that may be systematically associated with performance under the ODS, such as the quality of local institutions, the distance from the target, and the financial rewards. We also consider whether the scheme had unintended consequences. For instance, local authorities could have allocated efforts to strategically favour LPSs involved in the scheme over those not involved. Displacement might also have occurred within the LPS covered by the ODS, favouring ODS targets over non-targeted indicators.

Our results show that the impact of the ODS was extremely heterogeneous across regions and targets, and that a crucial driver of the effectiveness of the scheme was local institutional quality. Moreover, some features of the incentive scheme, such as the equalization of targets across regions, seem to have undermined the decentralized governance structure. We also find evidence of displacement: in the transport sector, a key LPS not involved in the ODS, the treated authorities performed relatively worse than those not part of the programme. We also find similar displacement effects within the education sector when comparing performances covered by the ODS (concerning early school-leavers and high-school competencies only) and those not covered.

Our study is linked to the literature on the assessment of incentive schemes for local government. This literature mainly refers to the UK CPA, the Comprehensive Performance Assessment (Boyne, James, John, & Petrovsky, 2009; Lockwood & Porcelli, 2013; Revelli, 2008, 2010). Other related papers are Revelli (2006), who analyses the English SSPR (Social Service Performance Rating), Burgess, Wilson, and Worth (2010), who analyse the interplay between dissemination of information and performance in the education sector (elaborating on the abolition of school league tables in Wales), and Besley, Bevan, and Burchardi (2009), who investigate the effect on patient waiting lists of the hospital star-rating regime in England in 2001–2005. More in general, our paper is connected with the literature on incentives in the public sector. Propper and Wilson (2003) provide an overview of the issues involved in using performance management schemes and explicitly refer to transparency-related incentives and financial rewards. OECD (2009), Van Dooren, Bouckaert, and Halligan (2015), and Schumann (2016) discuss how to use outcome indicators to improve policy, also with reference to regional policy.

Compared with existing studies, which refer mainly to the US and the UK, we consider the case of Italy, a country with long-standing local differences in public service provision and an established tradition of centralization in the public sector. Our findings might be useful for countries with similar features (for instance, Southern European countries) that are also trying to enhance their performance measures in the public sector. Our paper is also interesting from a slightly different perspective: the incentive scheme experimented with the ODS will be replicated in many instances with the EU programming cycle 2014–2020 (under the heading of performance framework: see McCann, 2015). Therefore, our study could be used to inform the incoming policy framework. Last but not least, assessing the effectiveness of the ODS scheme might add evidence on the fiscal federalism trade-off. Decentralization allows better matching of local idiosyncrasies, although local ownership may magnify the power of local interest groups in setting the policy agenda, while the provision of LPS could reflect the low quality of local institutions (see e.g. Faguet, 2004). In this respect, providing local authorities with incentives to reach given targets for locally provided public goods might be seen as a means of lessening the fiscal federalism trade-off (Joumard & Kongsrud, 2003).

The paper is structured as follows. The next section provides the institutional details of the ODS and a descriptive analysis. Section 3 describes the identification framework and provides the DID results. Section 4 documents the findings from our attempt to interpret the DID results in the light of some underlying common explanations. Section 5 analyses the unwanted consequences of the scheme. The last section concludes, proving some elements of policy relevance.

2 | PROGRAMME DESCRIPTION

2.1 | The programme

The ODS incentive scheme was established in 2007 within the 2007–2013 EU framework for cohesion policy. Eight southern Italian regions—Abruzzo, Molise, Puglia, Campania, Basilicata, Calabria, Sicily and Sardinia—were involved in the programme (in our empirical exercise, they are the treated units). Central government (the principal) fixed some

**TABLE 1** LPS, indicators, and targets

Area of LPS	#	Indicators	Centre & North 2007	South 2007	Target 2013
Education	S.01	Early school-leavers (%)	15.7	24.9	10.0
	S.02	Students with poor competencies in reading (%)	18.2	37.0	20.0
	S.03	Students with poor competencies in maths (%)	22.9	45.7	21.0
Childcare and elderly care	S.04	Municipalities offering childcare services (%)	58.3	28.1	35.0
	S.05	Children in childcare (%)	16.3	4.3	12.0
	S.06	Old people assisted at home (%)	3.9	1.8	3.5
Urban waste management	S.07	Urban solid waste landfilled (Kg/inhabitants)	251.0	409.0	230.0
	S.08	Recycled urban solid waste (%)	35.2	11.6	40.0
	S.09	Composted solid waste (%)	36.4	6.0	20.0
Water	S.10	Water usage, relative to supply (%)	71.5	59.4	75.0
	S.11	Population served by advanced wastewater treatment plants (%)	77.6	62.5	70.0

Notes: S.02 and S.03 refer to 2006, S.10 and S.11 to 2005.

Source: http://www.agenziacoazione.gov.it/it/politiche_e_attivita/Obiettivi_di_Servizio

quantitative targets for the treated regions (the agents), relating to several LPS. Central government undertook to monitor and disclose progress towards the targets and to give financial rewards to the agents that attained them. The remaining Italian regions (twelve, from central and northern Italy) were not included in the scheme (they are the control units). The incentive scheme was formally put in place in 2007, but the treated regions had not finished preparing all the documentation needed to participate in the ODS until the end of 2008. This caused a delay of nearly one year in the actual implementation of the scheme. Participation in the programme was conditional on submitting a 'strategic plan' in which the local authorities set out all the measures they would take in order to achieve the targets and set aside the corresponding financing (from local, national, and EU sources). The final deadline for attainment of the target was 2013.¹

As reported in Table 1, ODS involved 11 outcome indicators (in what follows, we refer to each indicator using the prefix 'S' followed by a number from 1 to 11) of the provision and quality of LPS in the areas of: (i) education; (ii) childcare and elderly care; (iii) waste management; and (iv) water supply. The Table also reports for each indicator the target fixed under the programme and the (area average) starting point in 2007, both in the South and (for comparison) in the Centre and North. Gaps are huge and sometimes the actual 2007 figures for the central and northern regions compare much better than the 2013 targets for the southern areas.

Central government decided to restrict the aim of the policy to a relatively small number of targets in order to focus the agents' efforts on just few goals. Targets were common across regions (they were based on the average value of the same indicators in either the central and northern regions of Italy or in other EU or OECD countries, with the idea that these represented a minimum threshold). Crucially, the common target implies that the distance to fill does considerably vary across both regions and indicators.

The total amount of the financial reward was set at €3 billion (0.81% of the GDP of the treated regions). Total funds were allocated uniformly across the four categories (€750 million each). Within the same category, the targets might receive different financing shares (Table 2).

For each target the distribution followed a criterion based on each region's GDP and population level. Sicily and Campania got the highest level of potential financial rewards, with respectively 21.9% and 20.9% of the total amount, immediately followed by Puglia (16.6%), Sardinia (11.6%) and Calabria (9.5%). The regions with the lowest amount of

¹The scheme also envisaged an intermediate deadline: a share of the financial reward was to be dispensed in 2009, in proportion to the progresses made by the region in each indicator. The disbursement of the remaining part was entirely contingent on attaining the final target in 2013.

**TABLE 2** Distribution of the pledges for all indicators

	Education			Childcare and elderly care			Urban waste management			Water		Pledges per region
	S.01	S.02	S.03	S.04	S.05	S.06	S.07	S.08	S.09	S.10	S.11	
Abruzzo	10.9	10.9	10.9	8.9	8.9	17.7	13.3	13.3	8.9	17.7	17.7	139.0
Molise	6.1	6.1	6.1	4.9	4.9	9.9	7.4	7.4	4.9	9.9	9.9	77.6
Campania	52.2	52.2	52.2	42.6	42.6	85.2	63.9	63.9	42.6	85.2	85.2	667.7
Puglia	41.6	41.6	41.6	33.9	33.9	67.9	50.9	50.9	33.9	67.9	67.9	532.1
Basilicata	11.4	11.4	11.4	9.3	9.3	18.7	14.0	14.0	9.3	18.7	18.7	146.4
Calabria	23.7	23.7	23.7	19.4	19.4	38.8	29.1	29.1	19.4	38.8	38.8	303.9
Sicily	54.8	54.8	54.8	44.8	44.8	89.5	67.1	67.1	44.8	89.5	89.5	701.5
Sardinia	28.9	28.9	28.9	23.6	23.6	47.3	35.5	35.5	23.6	47.3	47.3	370.6
Total	229.6	229.6	229.6	187.5	187.5	375.0	281.2	281.2	187.5	375.0	375.0	2938.8

Notes: Data in € million.

Source: http://www.agenziacoazione.gov.it/it/politiche_e_attivita/Obiettivi_di_Servizio

allocated rewards were Basilicata, Abruzzo and Molise with 4.6%, 4.3% and 2.4% respectively. Given the common target and the heterogeneous starting points, the amount of the financial reward did not reflect the effort required of the local government to achieve the targets. It is also important to note that the ODS rules require the funds attached to each indicator to be received irrespective of the progress made in the other indicators.

The ODS framework underwent a number of changes over the years as far as the funds earmarked by central government were concerned. First, the 2009 intermediate rewards, which were computed according to the progress made up to then and set overall at €638 million, were never actually paid to the regions because of political frictions caused by the change of central government in 2008 (the new government was somehow reluctant to carry on the policy of its predecessor). Second, in 2011 the total amount of funds was reduced to €1,031.8 million (without any change in the distribution across regions and indicators) because of Italy's increasing public finance difficulties at the time. We discuss the issues raised by the reduction and postponement of part of the rewards in the final section, arguing that this is not the reason for the unsatisfactory performance of the programme.

The structure of the incentives was underpinned not only by the financial package. The idea was to increase the local authorities' accountability through public participation; by establishing easy-to-measure targets and monitoring each region's progress, it was hoped to involve the citizens and the responsibility of the local élite. Central government set up a dedicated website to disclose performances (http://www.agenziacoazione.gov.it/it/politiche_e_attivita/Obiettivi_di_Servizio). The programme received wide attention in the media, both national and local.

2.2 | Descriptive analysis

To proceed with our analysis we needed to make all the eleven indicators comparable. Some of them relate to a public good while others denote a public bad; moreover, they are often expressed in different units as they refer to different public services. We use a transformed indicator \tilde{y}_{it} that can always be interpreted as a *percentage with respect to the target*.² Specifically, for indicators S.04, S.05, S.06, S.08, S.09, S.10 and S.11 (public goods) the transformation we use is given by the following formula:

²This approach is very similar to that followed by the World Bank in the "Doing Business" Survey, where the indicators are transformed as percentage "distance to the frontier," with the frontier being the value registered by the best performer (see World Bank, 2017). Notice that, being (1), (2) and (3) linear transformations, the linear relationships between all variables is preserved and the correlations unchanged.



$$\tilde{y}_{irt} = \frac{y_{irt}}{\text{target}_i} \times 100, \quad (1)$$

where y_{irt} is the value of the indicator, \tilde{y}_{irt} is its transformation, and subscripts i , r and t index the indicator number, the region, and the year.

As for indicators S.01, S.02 and S.03 (public 'bads'), the transformation is:

$$\tilde{y}_{irt} = \frac{100 - y_{irt}}{100 - \text{target}_i} \times 100, \quad (2)$$

while for indicator S.07 (public bad), which, unlike S.01, S.02 and S.03, does not have an obvious upper bound, we use:

$$\tilde{y}_{irt} = \frac{716 - y_{irt}}{716 - \text{target}_i} \times 100, \quad (3)$$

where 716 is the highest observed value of *per capita* urban solid waste produced by the treated regions from 1996 to 2013 (Tuscany in 2006, in kilograms).

Table 3 gives the initial and final values of the non-transformed indicators. As the table shows, because of the features of the scheme (common targets fixed on the basis of central and northern or international figures) some of the regions had already reached some of the targets before 2007 (the target set for indicator S.06 had already been achieved by Abruzzo, Molise and Basilicata, the one for indicator S.04 by Campania and Puglia, and the one for indicator S.11 by Molise, Campania and Sardinia). At the end of period, the total number of targets attained increased sharply for some of the regions. The most successful ones were Sardinia and Abruzzo, which attained seven and five targets respectively, followed by Molise and Puglia with three, Basilicata and Campania with two, and Sicily with only one, while none of the targets were achieved by Calabria.

Although many targets had not yet been attained by the regions in 2013, the final scenario is one of an overall reduction in the initial gaps. As shown in Figure 1, for almost all the indicators the mean distance with the respective target had narrowed in 2013 with respect to 2007. The indicators that recorded the best performance in terms of distance reduction were S.06 and S.09, which showed a decrease in the initial distance of about 130 and 150 percentage points (pp) respectively and therefore on average considerably exceeded the target. Indicators S.02, S.04 and S.07 saw large average improvements as well, with a reduction of the mean initial gap of 67 pp, 75 pp and 84 pp respectively. A good reduction of the mean initial distance was also achieved for indicators S.03, S.08 and S.11, which decreased by around 50–60 pp. Finally, indicators S.01, S.05 and S.10 displayed the worst performance, with the first two showing a reduction in the initial distance of about 20 pp and the latter even an increase in the mean distance with respect to 2007 of about 12 pp.

The whisker plots on the bars of Figure 1 show the values of the standard deviations of the distances. The initial distances in 2007 were heterogeneous across regions, especially for indicators S.04, S.06 and S.11, whose standard deviations were even higher than their means. As regards the change in distance variability over time, the scenario after the implementation of ODS was one of general divergence in the level of public services provided across regions. The standard deviations of the transformed indicators S.02, S.03, S.04, S.05, S.07, S.08, S.09 and S.10 all increased from 2007 to 2013, with changes ranging from the 23 pp of S.10 to a five-fold increase in the variability of the distance of S.09. The remaining indicators S.01, S.06 and S.11, instead, showed a reduction in the variability of the distances ranging from 8 pp for S.01 to almost 33 pp for S.11.

3 | ESTIMATING THE IMPACT OF THE ODS

The descriptive analysis suggests that during the period 2007–13 the southern regions of Italy generally made improvements in the local public services covered by the scheme, even though the progress was not uniform across



TABLE 3 Initial and final values of the indicators

Category Indicator Year	Education						Childcare and elderly care						Waste management						Water sources					
	S.01		S.02		S.03		S.04		S.05		S.06		S.07		S.08		S.09		S.10		S.11			
	initial (2007)	final (2013)	initial (2006)	final (2012)	initial (2006)	final (2012)	initial (2007)	final (2012)	initial (2007)	final (2012)	initial (2007)	final (2012)	initial (2007)	final (2013)	initial (2007)	final (2013)	initial (2007)	final (2013)	initial (2005)	final (2012)	initial (2005)	final (2012)		
Abruzzo	15.0	11.4	-	22.4	-	26.7	32.5	60.0*	8.7	9.8	3.7*	4.9*	427.3	70.1*	18.6	42.9*	14.3	36.7*	55.4	57.7	51.4	65.9		
Molise	16.4	15.4	-	21.7	-	29.9	6.6	22.8	4.8	10.4	3.8*	3.9*	400.9	448.0	4.9	19.9	0.9	39.9*	54.9	52.8	84.8*	80.4*		
Campania	29.0	22.2	36.1	28.2	44.3	35.8	38.7*	33.2	1.9	2.7	1.6	2.8	362.6	84.8*	13.5	44.0*	1.0	8.5	59.8	54.2	85.5*	72.2		
Puglia	25.1	19.9	36.3	16.7*	43.0	26.3	36.4*	38.0*	4.6	4.4	1.6	2.2	484.9	315.4	8.9	22.0	4.8	25.1*	52.7	65.4	58.5	68.2		
Basilicata	14.1	15.4	34.0	20.8	38.4	30.5	25.2	32.1	6.9	7.0	4.3*	5.4*	303.6	205.3*	8.1	25.8	0.0	0.0	65.2	61.5	61.1	66.1		
Calabria	21.2	16.4	-	37.4	-	45.8	14.2	8.8	2.0	2.1	2.8	3.1	261.6	300.2	9.1	14.7	8.1	9.6	65.5	64.6	43.5	54.1		
Sicily	26.1	25.8	40.8	29.6	48.9	37.3	34.4	33.8	5.5	5.6	1.0	3.6*	501.3	441.3	6.2	13.4	7.9	12.4	64.4	54.4	43.4	45.9		
Sardinia	21.8	24.7	37.2	27.3	45.3	33.3	20.7	33.7	8.9	12.9*	1.2	4.6*	306.7	154.5*	27.8	51.0*	11.8	85.3*	53.6	45.2	87.4*	84.7*		
South	24.9	14.1	37.0	26.5	45.7	34.4	28.1	32.5	4.3	5.0	1.8	3.3	409.0	250.5	11.6	28.9	6.0	20.6	59.4	56.6	62.5	63.7		
Centre & North	15.7	21.4	18.2	15.1	22.9	18.6	58.3	65.0	16.3	17.9	3.9	4.7	251.0	144.9	35.2	48.5	36.4	53.2	71.5	65.9	77.6	75.7		
Italy	19.7	17.0	26.4	19.5	32.8	24.7	48.6	54.6	12.0	13.5	3.3	4.3	306.6	181.3	27.5	42.3	25.2	42.5	67.4	62.6	72.3	71.5		
Target	10.0	20.0	21.0	21.0	35.0	35.0	35.0	35.0	12.0	12.0	3.5	3.5	230.0	40.0	40.0	20.0	20.0	75.0	75.0	70.0	70.0	70.0		

Notes: *denotes values of the indicators above the target.

Source: http://www.agenziacoesione.gov.it/it/politiche_e_attivita/Obiettivi_di_Servizio

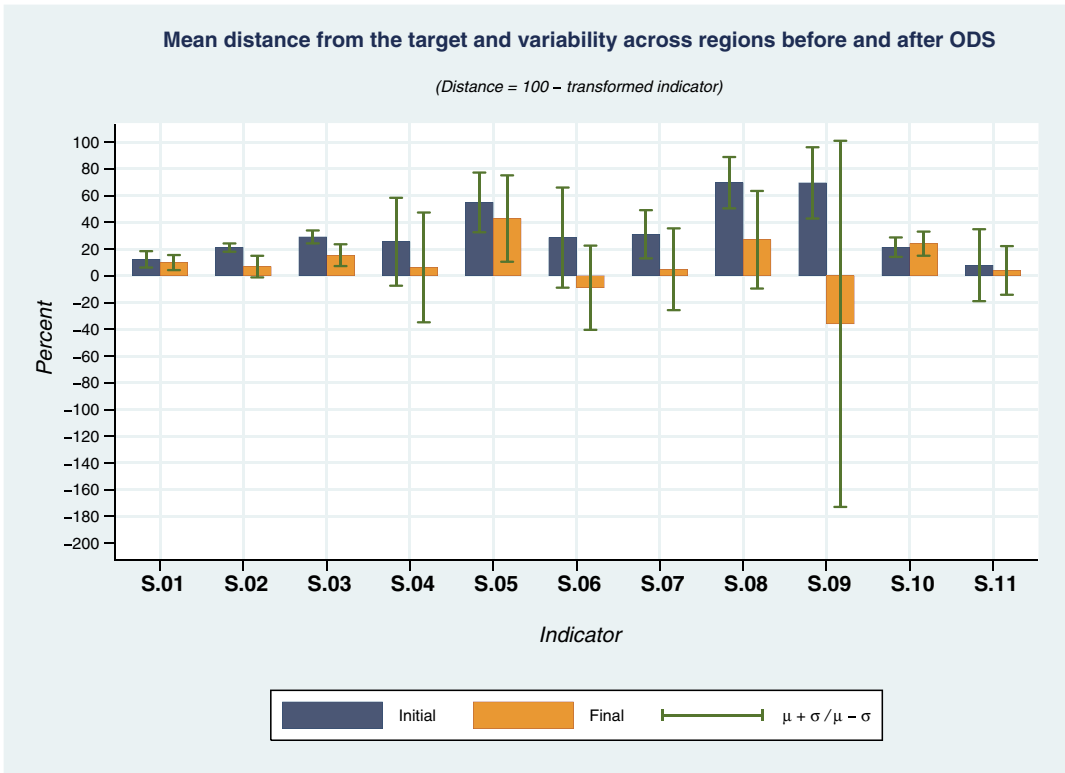


FIGURE 1 Average progress across indicators. Mean distance from the target and variability across regions before and after ODS

Notes: The distances are expressed in percentage with respect to the target.

Source: http://www.agenziacoesione.gov.it/it/politiche_e_attivita/Obiettivi_di_Servizio

regions and indicators. In the light of these results, the question is whether such improvements were directly associated with the adoption of the ODS, or whether they were instead due to a more general trend that was not related to the programme.

In order to disentangle these two explanations, we compare changes in the indicators in the southern regions with those in the central and northern ones where the ODS was not adopted. Figure 2 shows the average value of the indicators across southern and central and northern regions at the beginning and at the end of the programme. As the figure shows, the indicators in 2007 were on average equal to 65% of the value of the target in the southern regions and 105% in the central and northern ones. In 2013, these two percentages were 91% and 123%, denoting an increase in these values of 26 percentage points in the South of Italy and of 23 percentage points in the Centre and North. In other words, the southern regions seem to have performed only marginally better than the central and northern ones.

We propose an econometric exercise that is the formal counterpart of the evidence in Figure 2. Namely, we use a DID approach in which the regions involved in the scheme are the treated units, adopting as control group the twelve central and northern regions of Italy that were not treated. In this way, we are able to control for possible trends common to all Italian regions and not related to the policy. We consider the years from 2010 to 2013 as the treatment period because, as stated above, the programme effectively only started in 2009 and any action by the agents will reflect on the outcome variables with some delay. The adoption of this econometric approach relies on the assumption that indicator trends in the control regions represent a good counterfactual of the treatment group in the hypothetical scenario in which the ODS scheme was not implemented.

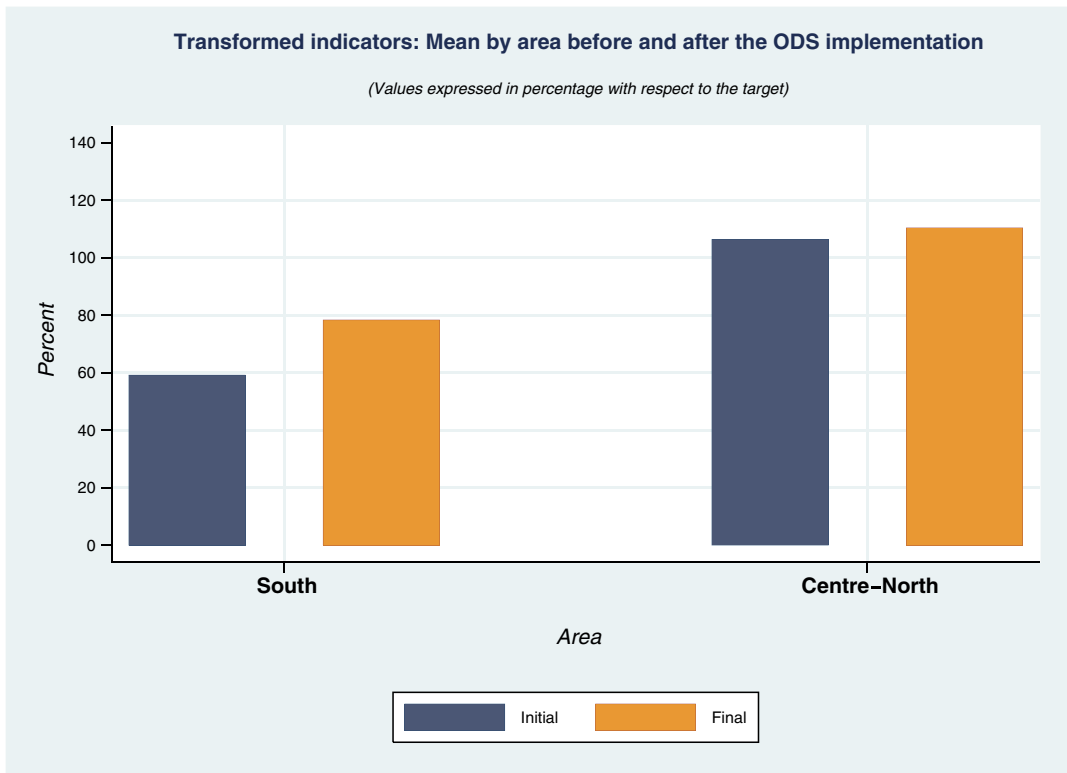


FIGURE 2 Average progress under the scheme: treated regions vs untreated counterparts. Mean of the indicators before and after ODS

Notes: Averages of all the transformed indicators for all the regions of the area; the values are expressed in percentage with respect to the target.

Source: http://www.agenziacoessione.gov.it/it/politiche_e_attivita/Obiettivi_di_Servizio

Indeed, our graphical analysis shows that the common trend assumption can be regarded as satisfied with respect to nine out of 11 indicators (see Figure 3). Moreover, we follow Lockwood and Porcelli (2013) and provide a more formal analysis of parallel trends by means of an F-test. More in details, we consider a linear model where the dependent variable is the transformed indicator and the set of covariates include: region and year dummies; a dummy variable that takes the value 1 for the treated regions and 0 otherwise; the interaction between the latter and the year dummies. The model is estimated over the pre-treatment years only both separately and jointly for all eight Southern regions and all 11 indicators. We perform an F-test of joint significance of the coefficients of the interacted dummies. Results, displayed in Table 4, confirm the evidence provided by the graphical analysis.

Finally, one may argue that some selection into the treatment is at work, so biasing our results. As other place-based initiatives, the ODS focus on the lagging regions of Italy – as defined by the EU regulation. From this point of view, the decision about what regions to treat is clearly not random. However, differences in the levels of public sector effectiveness between (northern and southern) regions are differentiated away by our DID estimation strategy, while differences in trends seem to be quite limited as shown by our tests reported above. It seems also fair to notice that anticipation effects (for instance, a slower pace of effectiveness in a given area in the hope of receiving more money with the start of the programme) are quite unlikely both because, as explained in the text, the programme did not make the financial premia depending on the progress made under the scheme and the uncertainty surrounding the implementation of the ODS (and its timing) was substantial.

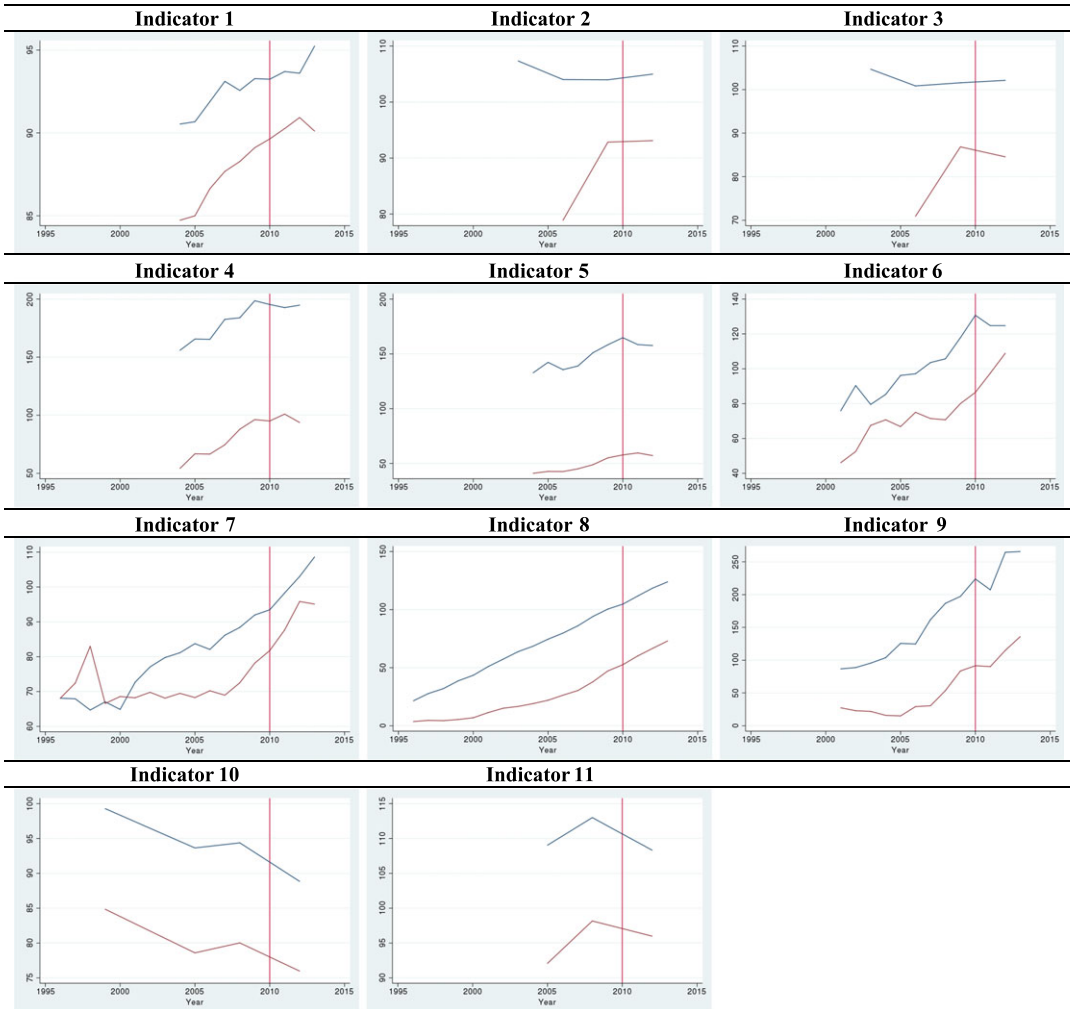


FIGURE 3 Graphical analysis of the common trend assumption for the indicators
 Notes: Average values of the transformed indicators for southern (treated, red line) and central-northern (control, blue line) regions.
 Source: http://www.agenziacoesione.gov.it/it/politiche_e_attivita/Obiettivi_di_Servizio

Our starting point is the following estimating equation:

$$\tilde{y}_{rit} = constant + \delta(O DS_r \times D_t) + \mu_r + \gamma_i + \lambda_t + \epsilon_{rt}, \tag{4}$$

where the estimation is run on the pooled sample, *r* indicates the region, *i* the indicator, and *t* the years³; \tilde{y}_{rit} is the transformed indicator⁴; *O DS_r* is a dummy variable that takes the value 1 for the treated region and 0

³S1: 2004–2013; S2: 2000–2012; S3:2003–2012; S4:2004–2012; S5: 2004–2012; S6: 2001–2012; S7: 1996–2013; S8: 1996–2013; S9: 2001–2013; S10: 1987–2012; S11: 2005–2012.

⁴Transformed indicators make interpretation easier. However, we also estimate regressions using non-transformed indicators as a robustness exercise. The results (not reported but available upon request) mirror those of the model estimated on transformed data in terms of both statistical significance and signs.

**TABLE 4** Pre-treatment trends of the indicators

	S.01	S.02	S.03	S.04	S.05	S.06	S.07	S.08	S.09	S.10	S.11
All Southern regions	0.989	0.001	0.003	1.000	0.998	0.998	0.701	0.108	0.888	0.987	0.900
Abruzzo	1.000	-	-	0.868	1.000	0.992	0.953	1.000	1.000	0.981	0.989
Basilicata	0.989	0.098	0.116	0.989	1.000	1.000	0.998	0.938	0.993	0.827	0.993
Calabria	0.921	-	-	1.000	1.000	1.000	0.947	0.986	1.000	0.762	0.890
Campania	0.900	0.427	0.386	0.999	1.000	1.000	1.000	1.000	0.964	0.928	0.990
Molise	0.958	-	-	1.000	1.000	0.282	0.997	0.849	1.000	0.849	0.908
Puglia	0.959	0.004	0.007	1.000	1.000	1.000	1.000	0.974	0.993	0.620	0.989
Sicily	0.997	0.115	0.085	0.999	0.999	1.000	1.000	0.888	0.999	0.946	0.966
Sardinia	0.357	0.038	0.078	0.999	0.996	1.000	1.000	0.880	0.905	0.956	0.869

Notes: We estimated the following model over the pre-treatment years $j \leq 2010$:

$$\tilde{y}_{rjt} = \alpha + \beta \text{ODS}_r + \sum_{j < T} \delta_j \text{year}_j + \sum_{j < T} \delta_j \text{ODS}_r * \text{year}_j + \varepsilon_{rjt},$$

ODS_r is a dummy equal to 1 for the Southern regions and 0 otherwise, while year_j is the vector of pre-treatment years, with $j = 1, 2, \dots, T - 1$. Each equation is estimated both separately and jointly for all 8 Southern regions r and all 11 indicators i . We test the null hypothesis: $\delta_1 = \delta_2 = \dots = \delta_{T-1} = 0$. The table shows the p-values for such F tests.

otherwise⁵; D_t is a dummy variable that takes the value 1 if $t \geq 2010$ and 0 otherwise; μ_r, γ_i and λ_t are region, indicator and year fixed effects respectively; ε_{rit} is a random disturbance. Our parameter of interest is the treatment effect δ .

Our point estimate for δ is reported in the first row and first column of Table 5. The ODS programme had a weak negative effect on the outcome. However, the aggregate effect may mask heterogeneity across regions and indicators. While the assumption of common trends seems to be violated for indicators S.02 and S.03, as a robustness check we replicate (first row, second column) our estimates without the latter indicators. The results are largely unchanged. When we repeat our regression by region, it turns out that the programme encouraged a good performance in Sardinia, while it had a negative impact in Basilicata, Calabria, Puglia and Sicily (Table 5, first column). In the other regions the effect is nil. Similarly, breaking down the estimates by indicator suggests that the programme was effective only for the indicator S.01, while the impact on the indicators S.08 and S.09 was negative and significant (Table 5, first row). Again, aggregating along some dimension may obscure large heterogeneity, which we try to discover by re-estimating Equation 4 for every single treated region and for each of the eleven indicators. We perform in total 88 DID regressions at the region-indicator level. In the end we are left with 88 estimated $\hat{\delta}$ s. The remaining cells in Table 5 show that the ODS impact varies dramatically in both significance and magnitude across both treated regions and indicators. In particular, the results show that there are instances of positive (minimum at the 10% confidence level; 24 cases out of 88), negative (32 cases at the same confidence level), and not statistically significant (22 cases) impacts of ODS on the outcome variables. A common path does not emerge.

However, the econometric findings broadly confirm what emerged from the previous analysis. Sardinia was the region where the ODS programme was most effective. The performance of Campania, instead, was slightly worse, with five positive treatment effects, four negative, and two not statistically significant. Finally, all the remaining treated regions strongly underperformed, especially Calabria and Sicily.⁶

⁵Since ODS was introduced by the central government, we consider this policy as exogenous to the regional administrations (see also Porcelli, 2014).

⁶Although in our baseline regression without controls the outcome variables do not show different trends for treated and control units, in order to improve the precision of our estimates we run our model after including in the controls group, similarly to Lockwood and Porcelli (2013), *per capita* GDP, which varies across regions-years and could partly affect, via taxation, local governments expenditure on public services. We did not include instead demographic variables, as they show very little variability over time and are captured by regional dummies. Results are largely unchanged. The results, not reported, are available upon request.



TABLE 5 Estimated treated effects

	All indicators	All indicators but S.02 & S.03	S.01	S.02	S.03	S.04	S.05
All regions	-10.05* (5.429)	-11.48* (6.11)	1.391** (0.539)	3.470 (2.227)	1.489 (2.033)	3.262 (7.237)	-4.850 (5.956)
Observations	2035	1929	200	53	53	171	180
Abruzzo	5.551 (7.501)	4.807 (8.69)	1.331*** (0.441)	-2.886** (1.048)	-1.312 (0.913)	40.38*** (15.31)	-4.641 (5.737)
Observations	1318	1250	130	34	34	108	117
Basilicata	-26.09* (13.84)	-28.42** (11.21)	-1.586* (0.885)	8.182* (4.611)	0.341 (4.801)	-6.952 (12.55)	-7.975 (5.457)
Observations	1320	1250	130	35	35	108	117
Calabria	-27.09** (11.54)	-29.93*** (8.45)	0.822 (0.968)	-6.511*** (1.048)	-8.400*** (0.913)	-15.90** (7.841)	-18.11*** (5.690)
Observations	1318	1250	130	34	34	108	117
Campania	-13.76 (12.49)	-15.2 (9.90)	3.396*** (0.887)	5.028** (2.037)	4.417* (2.275)	-14.81 (12.83)	-10.89* (5.946)
Observations	1320	1250	130	35	35	108	117
Molise	-18.72 (11.85)	-21.62** (10.68)	1.470 (1.570)	0.364 (1.048)	-1.438 (0.913)	21.00* (11.18)	21.05 (15.46)
Observations	1318	1250	130	34	34	108	117
Puglia	-14.72* (8.394)	-16.66** (8.02)	4.868*** (1.095)	10.42 (9.156)	5.378 (9.635)	-4.476 (7.896)	-18.95*** (6.132)
Observations	1320	1250	130	35	35	108	117
Sardinia	36.35** (15.61)	38.75** (19.47)	-0.0301 (1.660)	2.223 (6.045)	4.602 (5.531)	16.76** (7.734)	20.78** (10.24)
Observations	1320	1250	130	35	35	108	117
Sicily	-21.33** (9.066)	-23.48*** (7.95)	0.859 (0.751)	6.009 (4.357)	4.295 (5.374)	-9.905 (9.790)	-20.06*** (6.979)
Observations	1320	1250	130	35	35	108	117



TABLE 5 (Continued)

	S.06	S.07	S.08	S.09	S.10	S.11
All regions	-3.230 (10.86)	-4.814 (4.006)	-9.629** (4.554)	-35.43* (18.97)	0 (3.735)	3.563 (4.724)
Observations	238	360	360	260	100	60
Abruzzo	23.92* (12.50)	21.91** (8.900)	5.429 (4.289)	-34.57** (17.41)	5.792** (2.376)	21.70*** (2.496)
Observations	154	234	234	169	65	39
Basilicata	8.721 (11.26)	-18.98*** (4.776)	-19.26*** (5.593)	-111.1*** (22.94)	-0.542 (2.646)	7.696*** (2.489)
Observations	154	234	234	169	65	39
Calabria	3.322 (9.912)	-27.34*** (6.913)	-35.61*** (4.938)	-79.89*** (23.47)	0.825 (2.505)	13.27*** (3.320)
Observations	154	234	234	169	65	39
Campania	-1.405 (10.34)	26.98*** (5.622)	20.62*** (3.852)	-101.1*** (23.52)	-6.808** (3.198)	-18.52*** (2.493)
Observations	154	234	234	169	65	39
Molise	-86.09*** (25.81)	-30.71*** (7.760)	-23.17*** (5.833)	-16.06 (25.70)	1.025 (2.557)	-7.732** (3.091)
Observations	154	234	234	169	65	39
Puglia	-21.40** (9.467)	-0.237 (4.278)	-26.77*** (4.866)	-48.64** (21.81)	19.19*** (5.748)	14.84*** (2.496)
Observations	154	234	234	169	65	39
Sardinia	36.68** (18.02)	9.601*** (3.686)	37.09*** (5.279)	182.4*** (27.96)	-12.61** (5.468)	-6.232* (3.616)
Observations	154	234	234	169	65	39
Sicily	10.35 (18.17)	-19.74*** (4.242)	-35.37*** (5.648)	-74.48*** (18.09)	-6.875*** (2.229)	3.482 (2.577)
Observations	154	234	234	169	65	39

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.



In order to validate our results, we also devised a placebo test. We restricted our sample to the 12 Centre and North regions and randomly allocated five of them to a fake treatment, while keeping the rest as control regions. We estimated our model 1,000 times, hence using 1,000 different sets of “fake-treated” regions, drawn randomly each time. Results, available upon request, show that the estimated treated effects are almost always not statistically significant (it occurs in more than 90% of cases).

Our results seems to be in line with some descriptive evidence collected by Formez (2011), based on official documents about the ODS implementation plans. In short, this report suggests that there could have been impediments that are area- or target-specific, in agreement with the evidence we depict in the paper, while the differences in performance across regions have to be traced back to the local institutional quality (for instance, the report shows that Calabria and Sicily experienced greater difficulties with respect to other regions, especially in activating projects based on both EU and national funds).

4 | DRIVERS OF EFFECTIVENESS

From our estimates of the previous section, effectiveness seems to be scattered across regions and indicators. In this section we explore some of the reasons behind the marked heterogeneity of estimated treatment effects. We look for region and region/indicator factors that might shape the treatment effect by interacting them with the $ODS_t \times D_t$ term. These indicators are measured as dummies taking the value of 1 for the treated regions above the median value of that specific factor.⁷ In detail, we analyse the role of:

- The *initial distance* from the target (measured as 100 minus the value of the transformed indicator in 2007; negative values are set equal to 0). The initial distance equals on average 36% of the value of the target and it ranges from 0 (target already achieved) to 100%. Under the ODS setting, different targets may be rewarded by the same amount of money, even though the efforts needed to attain them are actually different. Moreover, the funds attached to a single target are received irrespective of the progress made with the other targets (see Section 2). These features of the scheme may bring about substitution effects: the regional government may concentrate its efforts on the closest, and thus easiest to reach, targets, while leaving aside the most difficult ones. This implies that a higher initial distance could be linked to a lower impact of ODS on the indicator. Hence, the expected sign is negative.
- The *financial reward* set (initially) by the ODS scheme, which is the direct financial incentive for the region to attain the target. As explained in Section 2, the financial reward for each target reflects the distribution of the pledges across indicators within LPS categories and regional GDP and population. In this analysis we use as regressor the ratio between reward and regional GDP, rather than the raw monetary reward, in order to take into account regional size heterogeneity (the value of the financial reward averages €33 million and ranges from €5 million to €89 million, while the reward-to-GDP ratio averages 0.092% with a standard deviation of about 0.04%). For this variable, the expected sign of its interaction with the term is positive.
- Areas displaying a lower *quality of governance* are generally associated with a misuse and dissipation of public resources, which, in turn, may make public spending both less effective and less efficient (Gupta, Davoodi, & Tiongson, 2002; Rajkumar & Swaroop, 2008). Hence, such regions might be less able to use resources to improve public services. For this reason, we expect local institutional quality to be positively correlated to the estimated treatment effects. The proxy we use is the European QoG Index (EQI) developed by the Quality of Governance Institute (Charron et al., 2016), which is constructed through a large survey dataset on the level of perceived corruption of institutions in 2010. The EQI for the southern regions is always lower than that of their central and northern counterparts; however, within the South

⁷However, different specifications of the drivers will deliver very similar results.



the variability is also considerable, with a standard deviation equal to about one third of the absolute value of the mean.

- *Political alignment* is relevant as long as the regional level depends financially on the central level, as is the case in Italy. The main implication of this dependency is that central government can channel more resources (over and above those relating to ODS) to politically aligned sub-national governments in order to maintain political power, as documented also by Bracco, Lockwood, Porcelli, and Redoano (2015), Kang (2015), Rumi (2014), and Lema and Streb (2013). Since these financial resources are fundamental for public expenditure on LPS, politically aligned regional governments could have had some benefit from reaching the ODS targets. On the other hand, aligned regional governments might receive extra money irrespective of their performance under the scheme. Therefore, the expected sign is ambiguous. Political alignment is measured as the fraction of the 2007–2013 period in which the regional government was politically aligned with central government. On average, regional governments were politically aligned for about 68% of the total 2007–2013 period, with minimum and maximum values of 44% and 89%.

The results with the pooled sample of treated regions (the baseline is therefore the first row of Table 5) are reported in Table 6. Our findings suggest that the discouragement impact of the initial distance is relevant only for urban waste management, underscoring that in this area of LPS large initial gaps might require outsize investment in waste disposal plants (which the local population often opposes).⁸ Very interestingly, we find that the quality of local governance always correlates with ODS performance, except in education, where there is a strong tradition of centralized management. Financial rewards do not show a clear correlation with performance under the scheme; moreover, for S.04 the double interaction coefficient cannot be estimated because of collinearity. This is likely explained by the fact that rewards do not reflect performance. Political alignment with central government is difficult to interpret: it facilitates performance in the areas of childcare and composted solid waste, but discourages performance for water supply.

5 | UNWANTED CONSEQUENCES

The southern regions were treated under the scheme for the entire EU programming period 2007–2013. They may therefore have concentrated their efforts for a long period on the areas of LPS covered by the ODS to the detriment of other LPS areas. To test whether displacement occurred, we look at transport. This sector is a good example of a key public service that is financed and managed locally. Moreover, for this LPS we have data to evaluate performance. In particular, we consider the four main statistical indicators referring to transport: km of local transport network (LTP1), parking spaces available in public facilities (LTP2), number of passengers (LTP3), and number of seats for passengers (LTP4). For these indicators we replicate Equation 4 by contrasting the southern regions with their central and northern counterparts. Note that the outcome is now expressed in terms of an untransformed indicator, as there is no target because this area of LPS is not involved in the scheme. The results are provided in Table 7. Our DID estimates suggest that the local authorities involved in the ODS scheme performed relatively worse than the regions not part of the programme. The estimated coefficients are negative most of the time and they often enter with high statistical significance. These findings suggest that the (scattered) progress achieved for the LPS involved in the programme may have come at the expense of other areas of public services managed by the local authorities.

Displacement may also have occurred within areas of LPS covered by ODS, favouring ODS targets over non-targeted indicators. This aspect is a standard risk when targets are employed to spur effectiveness. For

⁸One can reasonably argue that the role of distance may not be linear. For example, the discouragement effect may take place after a given (large) distance. Additional evidence, obtained by interacting the $ODS_t \times D_t$ term with the quartiles of distance, shows that this is not the case for urban waste management.



TABLE 6 Drivers of effectiveness

Variables	All indicators													
	All indicators	S.01	S.02	S.03	S.04	S.05	S.06	S.07	S.08	S.09	S.10	S.11		
ODS*POST	-0.933 (6.763)	-1.301 (7.031)	2.737** (1.167)	0.715 (5.272)	-2.521 (3.808)	-11.00 (8.219)	-33.06*** (10.20)	-14.37 (17.72)	24.03*** (5.390)	1.865 (6.018)	-91.74*** (25.43)	2.610 (5.196)	-17.01*** (2.921)	
Interactions with:														
Initial distance	-36.73*** (5.876)	-39.21*** (6.036)	0.480 (1.177)	5.896 (4.891)	6.474* (3.406)	-13.88 (9.772)	13.72 (9.505)	23.75 (17.63)	-33.76*** (6.160)	-33.02*** (5.479)	-30.28 (23.76)	13.53*** (5.003)	30.86*** (1.624)	
Financial rewards	-4.347 (6.740)	-7.300 (7.240)	-1.841** (0.927)	-0.138 (3.383)	-2.044 (2.739)	7.750 (4.960)	7.750 (4.960)	-11.05 (17.09)	-53.46*** (7.462)	-15.50* (8.021)	48.79** (22.23)	-5.093 (5.093)	0.929 (1.866)	
Institutional quality	6.685 (8.011)	10.54 (8.406)	-0.728 (1.090)	3.629 (5.166)	3.023 (3.545)	29.62** (11.76)	19.64*** (6.290)	21.40 (16.72)	25.00*** (7.521)	28.57*** (7.664)	19.47 (25.52)	-1.113 (4.173)	21.75*** (2.005)	
Political alignment	16.27** (8.216)	15.44* (8.700)	-0.604 (0.943)	-4.455 (3.577)	0.536 (3.045)	12.79 (9.055)	15.31** (6.856)	-11.81 (16.61)	4.540 (6.231)	-3.036 (5.007)	74.65*** (28.13)	-12.54*** (4.480)	-12.39*** (1.754)	
Constant	82.75*** (8.273)	82.52*** (8.607)	95.54*** (0.579)	91.30*** (2.745)	84.48*** (2.635)	130.0*** (15.22)	80.05*** (4.635)	125.6*** (16.03)	95.63*** (5.029)	82.10*** (3.884)	193.6*** (23.50)	92.95*** (1.728)	72.23*** (1.026)	
Observations	2,035	1,929	200	53	53	171	180	238	360	360	260	100	60	
R-squared	0.444	0.452	0.904	0.907	0.943	0.916	0.925	0.780	0.829	0.916	0.831	0.857	0.978	

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

**TABLE 7** Unwanted consequences: transportation

Variables	LPT1 ODS*POST	LPT 2 ODS*POST	LPT 3 ODS*POST	LPT 4 ODS*POST	Observations
Abruzzo	-71.66* (36.54)	-588.7 (507.9)	-0.45 (10.25)	-222.2* (130.8)	182
Basilicata	-95.69*** (23.83)	-2773*** (648.1)	-0.66 (10.62)	-226.2** (109.9)	182
Calabria	20.51 (26.21)	-2435*** (610.4)	-2.08 (10.59)	-52.73 (106.0)	182
Campania	115.0*** (40.17)	-224.9 (614.6)	-72.66*** (16.94)	-978.3*** (264.2)	182
Molise	-76.89*** (23.64)	-2546*** (661.2)	-0.06 (10.32)	-197.4* (109.1)	182
Puglia	-82.51* (46.31)	-296.8 (421.8)	-5.77 (10.28)	-61.83 (97.77)	182
Sardinia	-32.14 (22.15)	-2112*** (560.0)	3.57 (10.52)	-276.5** (107.4)	182
Sicily	-41.62 (28.34)	-882.1 (538.8)	-28.52*** (10.54)	-1278*** (222.4)	182

Notes: LPT 1 –Urban network of public transport; TPL2 –Parking bays in park-and-rides; TPL3 –Passengers travelling by public transport; TPL4 –Available seat kilometres in the provincial capitals. Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE 8 Unwanted consequences: education

Variables	EDU1 ODS*POST	EDU2 ODS*POST	EDU3 ODS*POST	EDU4 ODS*POST	Observations
Abruzzo	-0.216 (0.438)	-0.528 (0.468)	-0.251 (0.411)	-1.217 (1.131)	130
Basilicata	-0.516* (0.297)	-1.369*** (0.318)	-0.767*** (0.247)	-1.617 (1.046)	130
Calabria	-0.874** (0.417)	-1.444*** (0.286)	-0.951*** (0.301)	-2.617** (1.101)	130
Campania	-0.466* (0.274)	-0.144 (0.312)	-0.167 (0.251)	-2.542*** (0.683)	130
Molise	-1.133*** (0.319)	-1.036* (0.573)	-0.992*** (0.289)	-1.217 (0.892)	130
Puglia	-0.391 (0.382)	-0.586* (0.318)	-0.417 (0.310)	-0.292 (0.757)	130
Sardinia	0.592** (0.287)	0.239 (0.287)	0.541** (0.241)	-1.192 (1.038)	130
Sicily	-1.149*** (0.291)	-0.578** (0.290)	-0.742*** (0.253)	-1.892*** (0.490)	130

Notes: EDU1–Employees participating in learning and development; EDU2 – Unemployed workers participating in learning and development; EDU3–Adults participating in lifelong learning; EDU4–Tertiary education rate (ages 30–34). Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

instance, Schumann (2016) warns that indicators are not ends in themselves but rather instruments, and policies should not be tailored to do well on the targets but rather to achieve their broader objectives. To verify whether this was the case, we look at indicators for education that capture aspects not related to those involved in the scheme—concerning early school-leavers and high-school competencies. We consider aspects relating to both human capital accumulation for labour market participants and tertiary education. We use four indicators: employees participating in learning and development (EDU1); unemployed workers participating in learning and development (EDU2); adults participating in lifelong learning (EDU3); and the tertiary education rate (EDU4). The DID estimated coefficients, displayed in Table 8, are negative in most regions (in some cases with high statistical significance), suggesting that some displacement forces are at work even within LPS covered by ODS, favouring ODS targets over non-targeted indicators.

6 | CONCLUSIONS

The aim of *Obiettivi di servizio* was to improve the provision of public services in southern Italy. Our results suggest that the effect of the scheme on the indicators was generally low and highly variable across regions and indicators.



We find that better results are recorded when the quality of local institutions is higher and, in some cases, when the distance from the target is lower. The latter evidence suggests that the common target seems to have done poorly in enhancing effectiveness.

The positive relation between performance under the scheme and local institutional quality sheds light on one of the biggest problems, relating to the involvement of local stakeholders within a decentralization framework. Unfortunately, in the short run central governments cannot do much to improve local governance and fight corruption, as these aspects are generally deeply rooted in the territory and difficult to eradicate with immediate effect. However, a possible solution, when the quality of local institutions is low, could be to force stronger and continuous control of the action of local governments throughout the whole programme, with the potential benefit of reducing the dissipation of resources and the susceptibility to local interest groups.

A second consideration relates to the design of the incentive mechanism. Our analysis suggests that when the magnitude of the incentive is not proportionate to the amount of effort the agent has to make to achieve it, effectiveness is at risk. In some cases, the indicators that are initially more distant from the targets are also those with the worst performance, which might imply that regions put more effort into the targets that are easiest to achieve, while leaving aside the most difficult ones. Also, the overall structure of the financial rewards, which was not designed to reflect effort but rather the size of the participating regions, did not contribute to measured performance. In the light of these results, future incentive schemes should try to attach higher financial rewards to more distant targets, so that the incentives for the agents are aligned with the objective of the principal. Finally, in line with the evidence on the unwanted effects documented in the paper, it is also important to have targets for non-covered indicators, which are good candidates for displacement.

Finally, as explained in Section 2, central government did not respect the initial agreement (the intermediate-target rewards envisaged for 2009 were never disbursed; in 2011 the total financial resources for the programme was cut to one third of the amount originally budgeted). It is important, therefore, to discuss whether this failure to observe the initial promises had negative repercussions on the credibility of the principal and so jeopardized the functioning of the incentive scheme. We think this was not the case. To begin with, financial incentives were only part of the story. The programme received a lot of media attention and it probably increased both transparency and the accountability of local authorities. Therefore, it seems safe to assume that there were also other motivations (e.g. maximizing social welfare, or increasing the incumbent's probability of re-election) apart from financial rewards spurring performance under the scheme. Another aspect to consider is that the measures taken by the local authorities required a lot of initial effort to prepare the strategic plans and set up the public spending budget. Since the spending cuts mentioned earlier occurred unexpectedly⁹ some years after the programme was implemented, it is likely that before then the regions had already started carrying out their ODS public spending plans. As long as disinvesting is costly, it is hard to think of a complete dismantling of the entire plan thereafter. In other words, the expectation of future financial rewards could have given an initial 'big push' to improve local public services, and even though reality fell short of expectations, local authorities may have found it convenient to carry on their initial plans nonetheless. Overall, it seems that the problems with actual disbursement are not what drives our findings.

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⁹If the regional governments had anticipated these cuts, they would have promptly updated their attitudes and put less initial effort into their ODS strategic plans. In practice, it seems that the problem with the receipt of the transfers was not in fact expected. The lack of intermediate-target disbursement was due to a change in government (and was particularly surprising as in previous changes cohesion programmes had never been disputed). The reduction of the rewards in 2011 was driven by the need to cut the public deficit in the aftermath of the 2011 debt crisis, which was indeed hard to anticipate.



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Resumen. Creado por el gobierno central italiano e implementado en las regiones menos desarrolladas, *Obiettivi di Servizio* es un programa innovador diseñado para animar a las autoridades locales a alcanzar determinados objetivos en la prestación de servicios públicos como la educación, el cuidado de niños y ancianos, la gestión de residuos y el suministro de agua. El artículo concluye que el programa sólo logró un éxito parcial, y mostró diferencias considerables entre regiones y objetivos. Un factor importante de la eficacia fue la calidad de las instituciones locales. También se encontraron indicios de efectos de desplazamiento: las autoridades locales involucradas en el programa podrían haberse concentrado en sus objetivos en detrimento de otros servicios públicos locales.

抄録: Obiettivi di Servizioは、イタリア中央政府によって設立された、発展が遅れている地域で実施されている、イノベーションスキームで、教育、育児・介護、廃棄物処理、水道設備などの公共サービスの提供について、地方自治体が一定の目標を達成することを促進するものである。このプログラムは部分的にしか成功しておらず、地域や目標によってかなりの差があると考えられる。効果を推進する要因として、地域の制度の質が重要であることがわかった。また、プログラムに参加した地方当局は、結果的に他の地方公共サービスに損害を与える目標に集中していた可能性があり、置換効果の兆候も認められた。