Spend more, get more? An inquiry into English local government performance

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Spend more, get more? Command performance in English local government*

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Abstract

Based on a unique measure of performance of English local governments in the provision of public services (Comprehensive Performance Assessment, CPA), this paper uses panel data (2002-2007) to identify the determinants of performance. In particular, by thoroughly exploiting the features of the British system of local government finance and the mandatory nature of decentralized public service provision, this paper aims at investigating the impact of government spending on public service outcomes. Due to the nature of CPA ratings - measured on a five category (poor to excellent) scale - the empirical work relies on an ordered response approach allowing for cross-sectional heterogeneity. The empirical evidence suggests that local public expenditures in excess of centrally set spending standards have a detrimental effect on performance.

JEL classification: C23; C25; H72.
Key words: local public expenditures; performance rating; ordered response models.

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1 Introduction

The rising role of decentralized governments in the provision of public services in both developed and developing countries has spurred a growing research into the determinants of variously defined measures of subnational government performance.[1] Of particular interest from a public finance standpoint is the identification of the effect of the level of public spending on local government performance.

A well established strand of the literature exploits the decentralized provision of education that is observed in many countries and estimates production functions for education, where performance (be it at the state, school district or school level) is typically proxied by gross educational output in terms of standardized test scores, pass rates and drop-out rates. While the review in Hanushek [22] provides little evidence in favour of the hypothesis that public resources (in terms of expenditure per pupil, class size, and teacher qualification) have a positive and significant impact on pupils' achievements, the most recent studies report some more mixed results.[2] On the other hand, some authors proxy school performance by the marginal effect of schools on educational outcomes, and extract the value-added of schools from the residuals of a school gross output equation that controls for demographic, ethnic and socioeconomic composition of the student body.[3]

A parallel strand of the literature - reviewed in Propper and Wilson [34] and Propper et al. [35] - investigates the determinants of the performance of

[1] According to Joumard and Kongsrud [26], the average share of subnational government spending increased in the majority of OECD countries in the past two decades and reached $\frac{1}{3}$ in total public spending by the early 2000s. They also provide evidence, though, that national governments countered that tendency by imposing stricter norms and minimum quality standards on the locally provided public goods.

[2] Papke [31] considers Michigan schools and exploits the dramatic changes in funding schemes brought about by the centralizing school finance reform in 1994, and finds that spending has a significant positive effect on student achievement. Barankay and Lockwood [10] consider Switzerland and the heterogeneous degree of decentralization of the education sector, and find a positive impact of both decentralization and spending per pupil on educational outcomes. On the other hand, Leuven et al. [28] find negative effects of targeted subsidies at schools with large proportions of disadvantaged students on nationwide exam achievements in the Netherlands.

[3] Grosskopf et al. [19], [20]

health care providers, and points to the technical difficulties in constructing accurate and meaningful measures of performance and value-added outcomes in the health care domain. Recent work focusing on the British health service (Propper et al. [33], [32]) explores in particular the impact of competition on health care outcomes by exploiting the dramatic changes in attitudes and norms towards competition that occurred in the UK during the 1990s.

Finally, a strand of the literature aims at measuring the overall performance of multi-purpose decentralized governments. In those studies, local government performance is typically proxied by measures of technical efficiency and is estimated via stochastic or non-stochastic techniques.[4] Recent works in this area include Hayes et al. [24], De Borger and Kerstens [15], Geys [17], Revelli and Tovmo [38], Balaguer-Coll et al. [9] and Afonso and Fernandes [1], where the issue of overall local government efficiency is confronted with data on municipal governments in the US, Belgium, Norway, Spain and Portugal respectively. Grossman et al. [21] consider a sample of US central cities and, based on the argument that local government efficiency is capitalized into property values, take the latter as a measure of the output of local government activity, and a recent paper by Hauner [23] estimates the efficiency of public expenditures on health, education and social protection by the regions of the Russian Federation.

This paper aims at contributing to the existing literature on the effect of public spending on decentralized government performance in the following ways. First, based on the properties of a unique measure of English local government performance, this paper provides a simple theoretical framework that fully encompasses the institutional features of the British system of local government finance in order to highlight the effect of public expenditure on performance. In particular, the theoretical set-up takes deviations of actual spending decisions from centrally set spending standards as the crucial input variable in the performance determination process, and exploits the mandatory nature of local

[4] An early analysis in this spirit, though restricted to the evaluation of the efficiency of US police departments in producing a single output (crime rate), is Davis and Hayes [14]. For a cross-country comparison of national government performance with respect to health, education and public infrastructure outcomes, see Afonso et al. [2].

public service provision to model the effect of public resources on performance. Second, the paper uses panel data on institutional, financial and socioeconomic characteristics of the 150 main local authorities in England in the 2002-2007 time span to identify the determinants of performance in the provision of public services.

The measure of performance that is analyzed here - CPA (Comprehensive Performance Assessment) rating - has a number of attractive features. First, it is built by an independent Commission - the Audit Commission - which annually reports on its findings (mainly based on audit and inspection activity) and categorizes English local authorities in a consistent, comparable and transparent way. Second, CPA has the unique feature of combining information on public service level and quality with indices of costs of services, thereby approximating an ideal performance score that promises to be superior both to indices built on gross output only and to crude measures of technical efficiency. Third, CPA is a unitary assessment of the overall performance of local governments on a wide range of important local public services (including education, personal social services, public transport and environmental management) on a five category scale (poor to excellent). In spite of the computational complications arising from the categorical ordered nature of the rating (requiring an ordered response latent variable econometric model), the CPA system has the advantage of summarizing the overall activity of each local government in a simply understood index.

Maximum likelihood estimation of a random effects ordered probit model that accounts for the categorical nature of CPA ratings provides no evidence that higher public spending translates into better service performance. Rather, the estimate of the effect of expenditures on performance is negative. Moreover, controlling for correlation between jurisdiction-specific effects and regressors and for fixed characteristics of a locality - including institutional structure and socioeconomic complexion - provides further evidence in support of the hypothesis that public expenditures in excess of centrally set standards have a detrimental

effect on performance.

The remainder of the paper is organized as follows. Section **2** illustrates the key features of the CPA system. Section **3** develops a simple framework for the analysis of the performance determination process, and models the link between public spending and performance by thoroughly exploiting the features of the British system of local government finance and equalization. Section **4** turns to the empirical analysis on panel data of the main local authorities in England over the 2002-2007 period, and section **5** concludes.

2 Comprehensive Performance Assessment

In 2002, a system of rating of local government performance - CPA (Comprehensive Performance Assessment) - was introduced in England in order to measure how well Councils deliver services for local communities. An independent body (the Audit Commission) assesses the performance of the 150 English authorities that are responsible for the bulk of local public expenditures (including education, social care, roads and transport, and environmental services).[5] The Audit Commission annually delivers CPA ratings based both on its own audit and inspection activity and on the assessments provided by other independent Commissions: the Commission by the Office for Standards in Education (OFSTED) and the Commission for Social Care Inspection (CSCI).[6]

CPA aims at looking at performance from a range of perspectives and, based on distinct assessments of the level, quality and "value for money" of each of the public services that are provided locally, it delivers a simply understood comprehensive rating on a five category (poor to excellent) scale of the overall performance of the English local authorities in exercising their functions.[7]

[5] Those authorities cover the whole of England and comprise 34 Counties and 47 Unitary Authorities in non-metropolitan areas, and 69 Authorities (Boroughs) in metropolitan areas.

[6] What follows is an extremely simplified representation of the actual CPA system. It aims at capturing its essential features for the purpose of this paper. Full details can be found in Audit Commission [7] as well as on the Audit Commission website: www.audit-commission.gov.uk.

[7] For a critical assessment of the ability of CPA to properly capture public service quality, see Andrews [3] and Andrews et al. [4].

The public services provided by the 150 local authorities cover the following five main areas: 1) services to children and young people (including nursery, primary and secondary education, and social services to children); 2) social care services to adults, elderly and mentally ill people; 3) housing services; 4) environmental services (including road maintenance, public transport and refuse management); 5) culture (including sport, leisure and libraries).

Service assessment scores are published annually for each of the above service areas ($j = 1, ..., 5$) in each jurisdiction ($i = 1, ..., 150$), and bring together information both on the level of services provided (s_{ij}) and on the cost of provision (c_{ij}).

Assessments of the level of services s_{ij} are delivered by the Audit Commission itself in the service areas 3 (housing), 4 (environment) and 5 (culture), while the Commission by the Office for Standards in Education (OFSTED) and the Commission for Social Care Inspection (CSCI) annually deliver independent assessments for the service areas 1 (children and young people) and 2 (social care) respectively.[8] All assessments are arrived at by exploiting existing information through national performance indicators (PI_{ij}) and relevant service inspections (IN_{ij}).[9] In practice, the assessment for each service is determined by combining a score for the performance indicators' set with a score for any relevant service inspections:

$$s_{ij} = s(PI_{ij}, IN_{ij}) \tag{1}$$

The level of service assessment s_{ij} is then combined with the cost of service

[8] An empirical analysis of how the introduction of central performance assessment affected the patterns of local spending on social care services is Revelli [36].

[9] The number of performance indicators employed is enormous, so that they cannot be reported all here. Examples of performance indicators include: student body test results, school value added measures, and health, safety and achievement indicators for looked after children in the service area 1 (children and young people); waiting times for residental care admissions for elderly people and percentage of adults with physical disabilities or mental health problems helped to live at home in the service area 2 (social care); the average time spent by homeless people in temporary accommodation and the average energy efficiency of the Council housing stock in the service area 3 (housing); the percentage of household waste recycled and the percentage of pedestrian crossing with facilities for disabled people in the service area 4 (environment); location and quality of sports facilities and library opening hours in the service area 5 (culture). Full listing of performance indicators and their weights in the CPA framework can be found in Audit Commission [7].

c_{ij} to yield the final performance assessment score for service j ($j = 1, ..., 5$):

$$\pi_{ij} = \pi(s_{ij}, c_{ij}) \tag{2}$$

where: $c_{ij} \equiv \frac{X_{ij}}{u_{ij}}$, X_{ij} is public expenditure on service j by authority i, u_{ij} is the number of users of public service j, and the score π_{ij} is typically expressed in terms of a discrete rating (0, 1, 2, 3 stars).

Finally, the scores for each of the locally provided services (π_{ij}, $j = 1, ..., 5$) are combined by the Audit Commission according to a function (λ) generating one of five comprehensive rating categories:[10]

$$CPA_i = \lambda(\pi_{i1}, ..., \pi_{i5}) \in [\text{poor}, \text{weak}, \text{fair}, \text{good}, \text{excellent}] \tag{3}$$

Since its introduction, the CPA system has produced six waves of ratings of local governments (2002 to 2007), as shown in table 1.[11] As far as overall performance is concerned, table 1 shows that Council performances increased significantly, with more than half of the authorities exhibiting a score improvement since the start of the system. Moreover, Councils achieving excellent performance rose from 21 in 2002 (14%) to 55 in 2007 (37%), and no Council was judged to perform poorly after 2005.

3 Some simple performance geometrics

Given the structure of the CPA system outlined in section **2**, and in order to investigate the link between public spending and performance, consider the score of authority i in public service j (π_{ij}) and assume that local governments are heterogeneous with respect to an unobserved degree of "inefficiency" α_i, i.e., the fraction of total public spending that is wasteful, in the sense that it does not contribute to the improvement of services. As a result, the cost function for

[10] The λ function attributes a higher weight to service areas 1 (children and young people) and 2 (social care) - that are considered "Level 1" services - and lower weights to housing, environment and culture ("Level 2" services) (Audit Commission [7]).

[11] Two of the 150 main English authorities (the City of London and the Isles of Scilly) are excluded from the empirical analysis because of their peculiar characteristics.

local public service j can be expressed as:

$$c_{ij} = \frac{1}{1-\alpha_i} c(s_{ij}) \tag{4}$$

with: $c(0) = 0$, $c' > 0$, $c'' > 0$, reflecting convex per user costs of public services due to the presence of fixed factors of production. By representing the locus of (s_{ij}, c_{ij}) pairs that can be obtained by varying the level of public expenditures, equation (4) can be interpreted as a performance production frontier (PPF_{ij}) for local government i in service area j, conditional on its exogenous degree of inefficiency.

Central government sets a "standard spending level" X^*_{ij}, i.e., the level of expenditure at standard levels of inefficiency α^* that allows each government, given its expected spending needs, to provide a standard level of public services s^*_j at the standard unitary cost c^*_j:[12]

$$X^*_{ij} = c^*_j \overline{u}_{ij} \tag{5}$$

where $\overline{u}_{ij} = E(u_{ij})$ is the expected number of users of service j in jurisdiction i, and:

$$c^*_j \equiv \frac{1}{1-\alpha^*} c(s^*_j) \tag{6}$$

The standard level of public services is mandatory, in the sense that local authorities have to provide at least s^*_j:

$$s_{ij} \geq s^*_j \tag{7}$$

Based on the standard spending assessments X^*_{ij} $(j = 1, ...5)$, central government sets up a grant distribution scheme (the Revenue Support Grant) that allows each government to achieve the standard level of expenditure in all service areas by exerting a standard tax effort, i.e., by setting the property tax rate (the Council tax) at its standard level ($\tau_i = \tau^*$) on the jurisdiction's domestic property tax base (B_i). Consequently, the grant distribution system equalizes

[12] While the British system of equalization allows for heterogeneous costs of providing public services due to exogenous local characteristics (CIPFA [11]), c^*_j is treated here as homogeneous across local authorities for simplicity.

all non-stochastic differences in tax base (B_i) and spending needs ($\overline{u}_{ij}$), and actual expenditures in service area j equal:

$$X_{ij} = c_{ij}u_{ij} = \left[\frac{1}{1-\alpha_i}c(s_{ij})\right](\overline{u}_{ij} + \varepsilon_{ij}) \tag{8}$$

where the number of users of service j in jurisdiction i is assumed to be made of a deterministic ($\overline{u}_{ij}$) and of a random (ε_{ij}) component, with $E(\varepsilon_{ij}) = 0$, $Var(\varepsilon_{ij}) = \sigma_j^2$.

Finally, the government in jurisdiction i sets the level of spending X_{ij} ($j = 1, ...5$) in order to maximize π_{ij} subject to (4), (6) and (7), before observing the realization of ε_{ij} and conditional on its exogenous degree of inefficiency α_i.

Figure 1 offers a geometric representation of the constrained optimization problem. The performance production frontiers in figure 1 (PPF_j) show the pairs of s_{ij} and c_{ij} that can be obtained at any given level of inefficiency by varying the level of public expenditures X_{ij}. Lower (higher) inefficiency is represented by upward (downward) shifts of the PPF_j. Let $PPF_j(\alpha^*)$ be the performance production frontier at the standard level of inefficiency, and $\left(s_j^*, c_j^*\right)$ the level and cost of public services when expenditures equal the centrally set standard X_{ij}^*. Figure 1 also shows iso-performance curves π_{ij}, i.e., the locus of (s_{ij}, c_{ij}) pairs generating the same level of performance in public service j. The iso-performance curves are drawn under the hypothesis of strict quasi-concavity of the performance function (2), reflecting the principle that further increases in the level of services above the centrally set mandate bring a decreasing marginal contribution to the performance score, and further increases in the cost of public services above the standard have an increasing detrimental impact on performance. Assume that point A^* in figure 1 - corresponding to $X_{ij} = X_{ij}^*$ - attains the highest performance π_j^* conditional on the inefficiency level α^*. This implies that, at point A^*:

$$\frac{1-\alpha^*}{c'(s_j^*)} = -\frac{\dfrac{\partial \pi_{ij}}{\partial c_{ij}}}{\dfrac{\partial \pi_{ij}}{\partial s_{ij}}} \tag{9}$$

with the slope of the performance production frontier $PPF_j(\alpha^*)$ equaling the

slope of the iso-performance curve π^*.

In order to examine the incentives and constraints generated by the performance rating scheme, consider the case of two governments of inefficiency α_1 and α_2 respectively, with $\alpha_1 < \alpha^* < \alpha_2$. Since the grant system equalizes all non-stochastic differences in tax base and spending needs, the only source of cross-jurisdictional heterogeneity in this context is inefficiency α_i, that we assume here to be an exogenous parameter that - at least in the short run - is not under control of politicians, but is determined by the structure and organization of the bureaucracy. The α_1-government will end up in point A', with cost of public services $c' < c_j^*$ and service supply $s' > s_j^*$, and will attain performance π'. The relatively efficient government is subject to two effects. First, being relatively more efficient than the average ($\alpha_1 < \alpha^*$), it faces a lower cost of production, thereby having an incentive to supply more local public services (a substitution effect). Second, the lower degree of inefficiency also generates an income effect pushing in the direction of higher supply of public services, due to the fact that, relatively to an α^*-government, the mandatory level of services can be delivered at a lower cost.

On the other hand, an unconstrained α_2-government would end up in point A'', with cost $c'' > c_j^*$, level of public services $s'' < s_j^*$, and performance π''. However, due to the constraint (7), a relatively inefficient government facing the performance production frontier $PPF_j(\alpha_2)$ has to raise spending up to point A''', attaining the level of services s_j^* at cost $c''' > c''$ and performance $\pi''' < \pi''$. In a way, the mandated level of services (s_j^*) forces inefficient governments to spend more than a performance-maximizing strategy would imply, and to reveal themselves as bad performers. In general, the higher the degree of (unobserved) inefficiency, the higher the level of spending needed to meet the central government mandate, and the lower the performance score. Empirically, one should therefore expect to observe a negative relationship between CPA ratings and public expenditures in excess of centrally set standards.

4 Empirical analysis

Due to the nature of the CPA system, according to which local governments are ranked on a categorical ordinal scale (poor to excellent), an ordered response empirical model is required. Let the unobserved variable generating the observed performance rating in jurisdiction i in year t be expressed as a linear function of a vector of time-varying local characteristics (z_{it}), fixed year effects (m_t) and an error term (η_{it}):

$$y_{it} = z'_{it}\beta + m_t + \eta_{it} \tag{10}$$

Depending on the realized value of y_{it}, observed performance ends up into one of five ratings: poor, weak, fair, good, excellent. However, since the poor performance category includes a small and fading number of authorities along the six years (23 observations, with zero counts in 2006 and 2007), it seems preferable to pool the poor and weak categories and implement the model according to the following thresholds:

$$CPA_{it} = \begin{cases} \text{poor/weak} & \\ \text{fair} & \text{if} \quad \lambda_1 < y_{it} \leq \lambda_2 \\ \text{good} & \quad\quad \lambda_2 < y_{it} \leq \lambda_3 \\ \text{excellent} & \quad\quad y_{it} > \lambda_3 \end{cases} \tag{11}$$

where λ_h $(h = 1, ..., 3)$ are parameters (thresholds) that define the observed performance rating.[13]

As far as the stochastic component of the model is concerned, we start from a conventional random effects ordered probit specification (Greene [18]):

$$\eta_{it} = g_i + \omega_{it} \tag{12}$$

where g_i is a random jurisdiction-specific effect, with $E(g_i|z_{it}) = E(\omega_{it}|z_{it}) = 0$, and g_i and ω_{it} are normally distributed and orthogonal to each other.

A random effects ordered probit model is preferable in this context to a fixed effects specification for a number of reasons. First, while the full ordered

[13] The estimation results turn out to be similar when using all five rating categories and estimating four threshold parameters. However, computation time is longer and convergence of the likelihood function is obtained with more difficulty.

probit model with fixed effects can in principle be estimated by unconditional maximum likelihood, this is not generally feasible in short panels ($N = 148$ and $T = 6$ in our case) and leads to inconsistent estimates (Ferrer-i-Carbonell and Frijters [16], Greene [18]). Second, the alternative estimation route represented by a fixed effects ordered logit model has the drawback of using only a fraction of the total information available in the data, with all units showing no change in the score variable being dropped (Ferrer-i-Carbonell and Frijters [16]). Moreover, similarly to the alternative fixed effects estimator developed by Das and van Soest [13] and based on the Chamberlain binary approach, fixed effects can only be identified by modelling unit-specific thresholds - an hypothesis that is untenable in our context of performance evaluation by strictly uniform criteria. Finally, the fixed effects ordered logit estimator entails the cost of losing the information needed to compute predicted probabilities and partial effects.

Consequently, we employ the widely used random effects ordered probit specification and try to control for fixed jurisdiction effects in two ways. First, we include a number of time-invariant local institutional characteristics as well as a number of Census 2001 variables as regressors - f_i in equation (13) - in order to capture fixed traits of a locality that might affect performance and be correlated with the included time-varying regressors:

$$y_{it} = z'_{it}\beta + f'_i\gamma + m_t + g_i + \omega_{it} \tag{13}$$

Second, we implement the approach proposed by Mundlak [30] and discussed in Greene [18]. The Mundlak's approach consists in relaxing the assumption underlying the random effects specification that $E(g_i|z_{it}) = 0$. In fact, given that a violation of that assumption leads to biased parameter estimates, Mundlak [30] suggests modelling explicitly the relationship between the time-varying regressors (z_{it}) and the unobservable effect (g_i) in an auxiliary regression. In particular, $E(g_i|z_{it})$ can be approximated by a linear function:

$$g_i = \overline{z}'_i\rho + r_i \tag{14}$$

with: $\overline{z}_i = \frac{1}{6}\sum_{t=2002}^{2007} z_{it}$ and $r_i|z_{it} \sim N(0, \sigma_r^2)$. By replacing (14) in (13), the

Mundlak formulation of the latent variable generating the observed performance rating is:

$$y_{it} = z'_{it}\beta + f'_i\gamma + \overline{z}'_i\rho + r_i + m_t + \omega_{it} \tag{15}$$

Vector z_{it} includes the size of resident population, population density, property tax base per capita, a dummy variable that equals one for "fragmented" councils - i.e., councils where no single party holds the majority of the seats, - a dummy variable that equals one for Conservative governments, and excess spending defined as local public spending per capita minus standard spending per capita set by central government.

The population and population density variables are included to allow for the possibility of economies of scale and congestion in the production and consumption of local public services respectively, while the property tax base variable is intended to capture income effects on the demand for public services. The council seat composition dummy variable is included to account for the fact that fragmented governments tend to be weaker than one-party governments (Roubini and Sachs [39]), and could therefore be less able to extract an efficient production of public services from the bureaucracy (Kalseth and Rattso [27]). The Conservative party dummy is included to allow for the possibility that, after controlling for observable performance determinants, party ideology might directly influence performance in the provision of public services.

Vector f_i includes authority class dummies (London Borough, Metropolitan Borough, Non-metropolitan Unitary Authority, Non-metropolitan County) and a dummy for the features of the local electoral system ("all out" elections every fourth year *versus* yearly "by thirds" elections) to control for differences in the institutional framework across English localities.[14] Moreover, in an attempt to capture the underlying demand for public service performance and proxy the

[14] About two thirds of the English local authorities (including all Counties and London Boroughs, plus a fraction of non-metropolitan Unitary Authorities) have *en bloc* elections every four years. In the other localities (including all Metropolitan Boroughs), elections take place "by thirds," in the sense that one third of the councillors are elected every year. In both all out and by thirds systems, councillors are elected on a "first past the post" basis and sit for a four-year period. For a full discussion of the local elelctoral system, see Revelli [37]. Whether and in which direction might the electoral system affect the performance of a local government is unclear a priori.

degree of control of the local polity on politicians' behavior, vector f_i comprises a number of Census 2001 variables reflecting the composition of the local population and workforce: the age structure of the population (percentage of residents aged 0-16 and aged over 75); the qualification level (in terms of the percentage of highly qualified workers) and sectorial composition (percentage of employment in financial and real estate services) of the workforce; the percentage of self-employed, unemployed and disabled workers; indicators of ethnic composition (percentage of the population that is white) and religious affiliation (percentage of the population that is religious). Finally, in order to verify if external constraints - in terms of environmental circumstances beyond policymakers' control - influence inter-authority variations in performance (Andrews et al. [4], [5]), vector f_i also includes the Census index of multiple deprivation (IMD), which is a comprehensive score based on several dimensions of social and economic deprivation of a locality.[15] Descriptive statistics of all the variables used in the analysis are reported in table 2.

The estimation results are shown in tables 3 to 6. Table A.1 in the Appendix reports, mainly for illustrative purposes and as a further check on the ordered probit model, the estimation results of fixed effects specifications that rely on linear approximations to the categorical CPA scores.

Table 3, column (a), reports the estimation results of a parsimonious ordered probit model specification on pooled data. Column (b) adds a number of time-invariant institutional characteristics. Columns (c) and (d) show the random effects ordered probit model estimates. In all instances, spending in excess of the standard is estimated to have a negative and significant effect on performance. As for the other variables, population size, property tax base and Conservative control are estimated to have a positive effect on performance, while population

[15] In particular, the IMD is constructed by combining measures of: income deprivation; employment deprivation; health deprivation and disability; education, skills and training deprivation; barriers to housing and services; crime; living environment deprivation. Since the IMD is highly correlated with the employment structure in a locality, the employment-related Census variables (rate of unemployment, percentage of self-employed, fraction of employment in the financial sector, and percentage of disabled) are dropped from the specifications that include the IMD.

density and fragmentation of the Council have no significant effect in the random effects specifications of columns (c) and (d). As far as the institutional structure is concerned, Unitary, Metropolitan and London authorities appear to perform less well than the (reference) County authorities, while the effect of the all out electoral system dummy is only weakly significant.

Table 4 reports the partial effects corresponding to the random effects ordered probit specification in column (d) of table 3. As far as the continuous variables are concerned, the partial effects are computed as marginal probability effects (MPE) of, say, regressor z_k on the probability of outcome $h = 1, ..., 4$ (poor/weak, fair, good, excellent), and are evaluated at the sample means:

$$\begin{aligned} MPE_{hk} &= \frac{\partial P(CPA_{it} = h|\widetilde{z}_{it})}{\partial z_{ikt}} \\ &= \frac{\partial \left[\Phi(\lambda_h - \widetilde{z}'_{it}\widetilde{\beta}) - \Phi(\lambda_{h-1} - \widetilde{z}'_{it}\widetilde{\beta})\right]}{\partial z_{ikt}} \\ &= \left[\phi(\lambda_{h-1} - \widetilde{z}'_{it}\widetilde{\beta}) - \phi(\lambda_h - \widetilde{z}'_{it}\widetilde{\beta})\right]\beta_k \end{aligned} \tag{16}$$

where: $\widetilde{z}'_{it} = [z'_{it}, f'_i, \overline{z}'_i, m_t]$ and $\widetilde{\beta}' = \left[\beta', \gamma', \rho', 1\right]$. For dummy variables, partial effects are computed as the change in the probability of outcome h when a dummy variable, say z^d_k, shifts from 0 to 1, and are evaluated at the sample means:

$$\Delta P_{hk} = P(CPA_{it} = h|\widetilde{z}_{it}; z^d_{ikt} = 0) - P(CPA_{it} = h|\widetilde{z}_{it}; z^d_{ikt} = 1) \tag{17}$$

As far as the effect of public spending is concerned, table 4 shows that higher expenditures make good and excellent performances less likely, and weak and fair performances more likely. At mean values, an increase in local public spending per capita by, say, 1% (amounting to around 13 pounds) lowers the chances of achieving good and excellent performances by about 5 and 1 percentage points respectively, and raises the chances of getting fair or weak performances by 6 percentage points.

Table 5, column (e), shows the estimation results of the random effects ordered probit model augmented with the Mundlak correction. When allowing for and explicitly modelling the correlation between jurisdiction-specific effects

and the regressors as in equation (14), the effects of the included time-varying characteristics turn out to be only weakly significant (tax base and Conservative dummy) or virtually vanish. However, the effect of public spending on performance remains negative and statistically significant.

A number of Census variables are added as controls in column (f) of table 5, and table 6 reports the corresponding partial effects. Most of the Census variables are estimated to have a significant impact on performance, with the proportion of highly qualified, white and religious people being associated with better government performance, and with the rate of unemployment and the fraction of employment in the financial and real estate services sector being associated with worse performances.

In column (g), where the IMD is included among the controls, deprivation is estimated to have a significant negative impact on performance, suggesting that the central equalization system might be failing to properly take account of overall adverse socioeconomic circumstances beyond the control of local policymakers (Andrews et al. [4]). It is interesting to notice that, once controlling for those external constraints, metropolitan authorities appear to be significantly more likely to achieve excellent performances than non-metropolitan ones: while table 1 shows that County governments achieve better performances than the other authorities (over 80% of good and excellent ratings against around 60% in the rest of the localities), table 2 reveals that Counties operate in a more favourable environment (in terms, for instance, of unemployment, community diversity and overall deprivation). In fact, in spite of facing more problematic socioeconomic conditions, metropolitan bureaucracies tend to have an advantage over non-metropolitan ones in attracting young, motivated and highly qualified labour force (Meier and O'Toole [29]).

Finally, the inclusion of the within-group averages ($\overline{z}_i$) among the right hand side variables of the performance determination equation in the Mundlak specification (15) makes the Census variables orthogonal to the time-varying regressors z_{it}. As a result, even when controlling for fixed socioeconomic community char-

acteristics, spending in excess of the standard exhibits a large detrimental effect on performance: a 1% increase in spending lowers the chances of attaining good and excellent performances by about 3 and 1 percentage points respectively, and raises the chances of getting fair or weak performances by around 4 percentage points.

5 Concluding remarks

Based on the properties of a unique measure of performance that was introduced in Britain in 2002 in order to measure how well local Councils provide services to their citizens, this paper has explored the determinants of local governments' performance scores. After setting up a simple analytical framework to model the performance determination process, we have used panel data on the main local authorities in England in the 2002-2007 time span to estimate an ordered response model that accounts for the categorical nature of performance ratings and for cross-jurisdictional heterogeneity.

The empirical analysis provides no evidence that higher public spending translates into better performance. Rather, the estimate of the effect of spending on performance is negative. Moreover, controlling for correlation between jurisdiction-specific effects and regressors and for fixed characteristics of a locality - including institutional structure and socioeconomic complexion - provides further evidence in support of the hypothesis that public expenditures in excess of centrally set standards have a detrimental effect on performance.

Overall, the steady upward trend in local government ratings suggests that the CPA system stimulated local governments to improve their performances.[16] Moreover, the aggregate evolution of scores over the period 2002 to 2007 was accompanied by a slowdown in public spending growth: while standard spending assessment set by central government grew at an average annual real rate of 5.5%, the average growth rate of actual local expenditures was less than 5%.

[16] In fact, based on English local government election results in the 2003-2006 period, Revelli [37] shows that CPA ratings have indeed a significant impact on incumbents' chances of re-election.

However, due to the short time-series dimension of the available panel data set, an explicit analysis of the underlying process of endogenous determination of efficiency is not feasible and remains an issue for future research.

Similarly, this paper has not tackled the important issues of strategic budgeting, endogenous spending determination and the rise of potentially dysfunctional responses to the process of performance assessment (Courty and Marschke [12]). In fact, the empirical analysis of the determinants of performance was based upon the hypotheses of orthogonality of shocks to performance with respect to actual budgeting decisions, and of neutrality of the very CPA system on the underlying objectives of local service providers. While the relaxation of the above hypotheses and an explicit account of potential gaming responses could certainly contribute to our understanding of the process of determination of local government performance, it reasonably seems to go beyond the scope of this paper and is consequently left for future work.

Appendix

As an informal test of the degree to which the ordered probit specification (15) actually controls for inter-authority unobserved heterogeneity, table A.1 reports the estimation results of a linear fixed effects specification of the performance determination equation. In addition, as a further check on the robustness of the ordered probit results, table A.1 also shows the estimation results of a linear dynamic panel data specification, based on the findings that organizational performance tends to exhibit serial auto-correlation (Meier and O'Toole [29]). In order to obtain standard fixed effects estimates of the vector of parameters β, the categorical CPA scores (poor/weak, fair, good, excellent) are somewhat arbitrarily coded as an evenly-spaced performance index (CPA $= \{1, 2, 3, 4\}$), and sort of brutally employed as the dependent variable in a linear performance determination equation. Columns (h) and (j) in table A.1 use the whole dataset (with two cross-sections being lost in the dynamic specification in column (j) after constructing the $t-1$ lag of CPA and taking first differences). On the other hand, the specifications in columns (i) and (k) try to alleviate the bias arising from right censoring of the CPA index by excluding all observations with an "excellent" score. The static specifications (h) and (i) report standard within-groups estimates, with OLS performed on the model with all variables taken as deviations from group means. On the other hand, the dynamic specifications are estimated by the generalized method of moments (GMM) on the first-differenced equation, where all of the exogenous variables lagged $t-1$ and more as well as the endogenous CPA variable lagged $t-2$ and more are used as instruments (Arellano and Bond [6]). Overall, the linear approximation to the actual CPA structure yields results that are qualitatively similar to the ordered probit specification. Virtually all estimated coefficients maintain the same sign as in the ordered probit model, though they are estimated with less precision due to the admittedly (and inevitably) arbitrary coding of CPA scores. Local public spending is again estimated to have a negative effect on performance, particularly in the specifications that account for the right censoring of CPA

ratings. Finally, the dynamic model provides evidence of significant serial auto-correlation in local authority performance, thus confirming previous results in the public organization literature (Meier and O'Toole [29]).

Table A.1 Performance determination equation: linear model

	(h)	(i)	(j)	(k)
CPA_{it-1}			0.6392	0.4166
			(7.78)	(5.37)
Population	-0.0065	-0.0057	0.0008	0.0014
	(1.59)	(1.15)	(0.10)	(0.16)
Density	-0.0093	0.0164	-0.0397	-0.0582
	(0.71)	(0.98)	(1.76)	(1.82)
Tax base	-0.0581	-0.0194	-0.0976	-0.0991
	(2.23)	(0.60)	(1.87)	(1.56)
Fragmented	0.0838	0.0148	0.1010	0.1219
	(1.33)	(0.21)	(0.93)	(1.04)
Conservative	0.1873	0.0824	0.1861	0.1822
	(2.11)	(0.88)	(1.18)	(1.11)
Excess spending	-0.0021	-0.0032	-0.0028	-0.0062
	(1.27)	(1.63)	(0.82)	(1.56)
year 2003	0.1345	0.1239		
	(2.36)	(2.07)		
year 2004	0.3751	0.2791	0.1834	0.1569
	(4.77)	(3.08)	(1.22)	(0.90)
year 2005	0.4881	0.4415	0.1128	0.2268
	(7.04)	(5.61)	(0.95)	(1.70)
year 2006	0.6771	0.6134	0.2606	0.4865
	(9.46)	(7.49)	(2.14)	(3.52)
year 2007	0.8001	0.7253	0.2709	0.5806
	(10.52)	(8.11)	(2.02)	(3.81)
Observations	888	662	592	469
Fixed effects	yes	yes	yes	yes

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Table 1 Comprehensive Performance Assessment ratings

	poor	weak	fair	good	excellent	
2002	12	21	41	53	21	148
2003	9	19	39	56	25	148
2004	1	14	33	60	40	148
2005	1	8	35	65	39	148
2006	0	5	25	72	46	148
2007	0	2	23	68	55	148
PARTY CONTROL						
Conservative (%)						
2002-2007	1.7	3.9	19.0	41.1	34.2	100.0
Labour (%)						
2002-2007	2.7	10.5	20.8	37.7	28.3	100.0
Liberal Democrats (%)						
2002-2007	1.5	4.5	23.9	58.2	11.9	100.0
Fragmented (%)						
2002-2007	3.5	8.5	26.0	44.6	17.4	100.0
AUTHORITY TYPE						
Counties (%)						
2002-2007	1.0	3.9	13.7	41.7	39.7	100.0
Unitary authorities (%)						
2002-2007	3.3	5.8	27.5	45.7	17.7	100.0
Metropolitan Boroughs (%)						
2002-2007	2.4	10.6	24.5	37.5	25.0	100.0
London Boroughs (%)						
2002-2007	3.6	11.5	20.3	42.7	21.9	100.0

Data sources: CPA scores: Audit Commission [7], [8]; Party control: United Kingdom Parliament, Social and General Statistics Section: House of Commons Library Research Papers (www.parliament.uk/parliamentary_publications_and_archives).

Table 2 Descriptive statistics

	obs.	mean	s.d.	min	max
Population (,000)	888	337.6	252.5	34.9	1371.3
Population density (persons per hectare)	888	24.5	27.3	0.6	153.6
Property tax base (band D equivalents × 100 residents)	888	34.2	5.2	22.5	63.7
Public spending per capita (£; 2005)	888	1297.0	251.7	884.1	2564.6
Standard spending per capita (£; 2005)	888	1258.3	262.7	784.6	2586.9
Public spending over standard per capita (£; 2005)	888	38.7	42.5	-297.0	135.5
Conservative	888	0.26	0.44	0	1
Labour	888	0.37	0.48	0	1
Liberal Democrats	888	0.08	0.26	0	1
Fragmented	888	0.29	0.45	0	1
All out electoral system	148	0.62	0.48	0	1
County	148	0.23	0.42	0	1
Unitary	148	0.31	0.46	0	1
Metropolitan	148	0.24	0.43	0	1
London	148	0.22	0.41	0	1
Census 2001 variables					
Age 0-16 (% population)	148	20.27	1.74	13.49	26.17
- County: Age 0-16	34	19.56	0.81	17.85	21.20
- Unitary: Age 0-16	46	20.40	1.81	16.65	25.23
- Metropolitan: Age 0-16	36	20.93	1.15	18.77	23.43
- London: Age 0-16	32	20.07	2.46	13.49	26.17
Age 75+ (% population)	148	7.27	1.57	3.97	12.06
- County: Age 75+	34	8.30	1.35	6.40	12.06
- Unitary: Age 75+	46	7.44	1.76	4.78	11.97
- Metropolitan: Age 75+	36	7.29	0.63	5.73	8.72
- London: Age 75+	32	5.90	1.23	3.97	8.24
Highly qualified (% workforce)	148	20.27	8.66	9.69	51.53
- County: Highly qualified	34	19.14	3.50	14.16	27.71
- Unitary: Highly qualified	46	17.44	5.51	9.87	30.40
- Metropolitan: Highly qualified	36	15.28	3.61	9.69	24.32
- London: Highly qualified	32	31.14	10.81	10.23	51.53

Table 2 (continued)

Census 2001 variables					
Disabled (% workforce)	148	5.64	2.23	1.94	12.15
- County: Disabled	34	4.51	1.58	2.43	10.32
- Unitary: Disabled	46	5.49	2.21	1.94	10.76
- Metropolitan: Disabled	36	7.79	1.89	4.39	12.15
- London: Disabled	32	4.61	1.25	2.51	7.04
Unemployed (% workforce)	148	3.62	1.23	1.55	6.91
- County: Unemployed	34	2.59	0.52	1.73	3.80
- Unitary: Unemployed	46	3.47	1.18	1.55	6.23
- Metropolitan: Unemployed	36	4.13	0.92	2.47	6.25
- London: Unemployed	32	4.36	1.36	2.47	6.91
Self-employed (% workforce)	148	7.93	2.24	3.94	13.71
- County: Self-employed	34	9.66	1.54	5.38	12.60
- Unitary: Self-employed	46	7.37	2.21	3.94	13.71
- Metropolitan: Self-employed	36	6.06	1.20	4.22	8.39
- London: Self-employed	32	8.99	1.86	4.96	13.57
Financial and real estate (% employment)	148	18.39	7.16	9.34	45.34
- County: Financial and real estate	34	15.74	4.00	9.86	26.06
- Unitary: Financial and real estate	46	16.32	5.34	9.34	28.32
- Metropolitan: Financial and real estate	36	14.59	2.88	10.72	22.58
- London: Financial and real estate	32	28.47	6.21	20.06	45.34
Religious (% population)	148	77.42	4.62	63.25	87.49
- County: Religious	34	77.87	2.79	73.32	84.06
- Unitary: Religious	46	76.22	4.90	63.25	84.20
- Metropolitan: Religious	36	80.80	3.37	74.03	87.49
- London: Religious	32	74.85	4.66	65.76	82.59
White (% population)	148	89.19	12.64	39.41	99.27
- County: White	34	97.09	1.88	92.13	99.27
- Unitary: White	46	93.32	8.33	63.70	99.09
- Metropolitan: White	36	91.85	7.24	70.35	99.08
- London: White	32	71.85	13.34	39.41	95.17
Index of multiple deprivation (IMD)	148	23.45	9.25	5.36	46.97
- County: IMD	34	15.67	4.18	8.08	25.66
- Unitary: IMD	46	22.60	9.04	5.36	38.94
- Metropolitan: IMD	36	29.53	6.85	16.16	46.97
- London: IMD	32	26.09	9.70	9.55	46.10

Data sources: Population and financial data: CIPFA [11]; Demographic data: United Kingdom Government, Office for National Statistics (www.statistics.gov.uk).

Table 3 Performance determination equation: ordered probit estimates

	(a)	(b)	(c)	(d)
Population	0.0009	0.0005	0.0025	0.0013
	(5.30)	(2.18)	(6.37)	(3.25)
Density	-0.0068	-0.0032	-0.0012	0.0059
	(4.15)	(1.38)	(0.28)	(1.35)
Tax base	0.0449	0.0443	0.0319	0.0377
	(5.07)	(4.17)	(1.16)	(1.90)
Fragmented	-0.3801	-0.3738	-0.0440	-0.0727
	(4.24)	(4.14)	(0.29)	(0.47)
Conservative	-0.3847	-0.3870	0.1353	0.4646
	(3.36)	(3.35)	(0.52)	(2.43)
Excess spending	-0.0057	-0.0058	-0.0130	-0.0136
	(4.96)	(4.82)	(4.10)	(5.40)
All out elections		0.2736		-0.5986
		(2.03)		(2.02)
Unitary		-0.2180		-1.4531
		(1.25)		(4.19)
Metropolitan		0.0219		-1.5561
		(0.11)		(3.90)
London		-0.5071		-1.5267
		(2.47)		(4.26)
year 2003	0.1801	0.1816	0.3581	0.3616
	(1.43)	(1.44)	(2.35)	(2.36)
year 2004	0.3392	0.3396	0.7134	0.7034
	(2.58)	(2.57)	(3.73)	(4.05)
year 2005	0.4957	0.4963	1.0239	1.0132
	(3.86)	(3.86)	(6.01)	(6.17)
year 2006	0.7190	0.7217	1.5399	1.5115
	(5.56)	(5.57)	(8.65)	(8.86)
year 2007	0.9128	0.9176	1.8835	1.8505
	(6.97)	(6.99)	(10.22)	(10.49)
λ_1	0.257	0.188	-0.383	-2.034
λ_2	1.172	1.112	1.508	-0.126
λ_3	2.415	2.363	4.435	2.835
Random effects	-	-	yes	yes
Log likelihood	-1048.83	-1043.78	-742.57	-736.10
Observations	888	888	888	888

Notes: t statistics in parentheses.

Table 4 Random effects ordered probit: partial effects

	poor/weak	fair	good	excellent
Continuous variables				
Population	-0.00001	-0.00045	0.00037	0.00009
Density	-0.00006	-0.00208	0.00170	0.00044
Tax base	-0.00036	-0.01326	0.01085	0.00278
Excess spending	0.00013	0.00478	-0.00391	-0.00100
Dichotomous variables				
Fragmented	0.00052	0.01834	-0.01518	-0.00368
Conservative	-0.00246	-0.10388	0.07549	0.03085
All out elections	0.00370	0.13882	-0.10449	-0.03753
Unitary	0.03165	0.40997	-0.38419	-0.05743
Metropolitan	0.04642	0.45304	-0.44954	-0.04992
London	0.04820	0.45029	-0.45337	-0.04511

Notes: partial effects (table 3, col. (d)) are computed according to equation (16) for continuous variables and to equation (17) for dichotomous variables.

Table 5 Random effects ordered probit: Mundlak specification

	(e)		(f)		(g)	
	z_{it}	$\overline{z}_i$	z_{it}	$\overline{z}_i$	z_{it}	$\overline{z}_i$
Population	-0.0181	0.0191	-0.0148	0.0190	-0.0160	0.0193
	(1.51)	(1.59)	(1.21)	(1.55)	(1.33)	(1.60)
Density	-0.0199	-0.0083	-0.0252	0.0664	-0.0243	0.0509
	(0.47)	(0.20)	(0.57)	(1.47)	(0.56)	(1.16)
Tax base	-0.1405	0.2672	-0.1395	0.2043	-0.1345	0.0363
	(1.73)	(3.19)	(1.66)	(2.19)	(1.67)	(0.42)
Fragmented	0.2093	-2.0906	0.1829	-1.1937	0.1801	-1.1454
	(1.17)	(7.06)	(1.01)	(4.27)	(1.00)	(3.91)
Conservative	0.4095	-2.3147	0.3950	-0.9622	0.3811	-0.8899
	(1.67)	(6.20)	(1.60)	(2.63)	(1.53)	(2.50)
Excess spending	-0.0109	-0.0126	-0.0119	0.0015	-0.0102	0.0007
	(2.23)	(2.27)	(2.41)	(0.27)	(2.11)	(0.14)
	f_i		f_i		f_i	
All out elections	-0.2178		1.3211		0.8934	
	(0.93)		(5.32)		(3.24)	
Unitary	-0.9686		1.6260		1.0494	
	(2.58)		(3.87)		(3.16)	
Metropolitan	-0.4948		1.7245		1.0181	
	(1.20)		(4.43)		(2.73)	
London	0.0667		2.0134		0.9442	
	(0.15)		(4.21)		(2.39)	
Age 0-16			0.1579		0.2023	
			(1.38)		(2.88)	
Age 75+			-0.0661		0.0504	
			(0.73)		(0.68)	
Highly qualified			0.1471		0.1301	
			(5.22)		(5.65)	
Religious			0.1681		0.1791	
			(6.62)		(8.53)	
White			0.0932		0.1109	
			(5.50)		(8.67)	

Table 5 (continued)

	(e)	(f)	(g)
Self-employed		-0.1020	
		(1.33)	
Financial and RE		-0.1409	
		(4.34)	
Disabled		0.1869	
		(2.60)	
Unemployed		-0.6163	
		(4.92)	
IMD			-0.0368
			(2.44)
year 2003	0.3987	0.4166	0.4045
	(2.52)	(2.59)	(2.54)
year 2004	0.8883	0.9152	0.9260
	(3.82)	(3.90)	(4.00)
year 2005	1.2583	1.2886	1.2761
	(6.16)	(6.26)	(6.27)
year 2006	1.8474	1.9087	1.8864
	(8.39)	(8.54)	(8.59)
year 2007	2.2282	2.3023	2.2768
	(9.40)	(9.55)	(9.60)
λ_1	-0.590	26.358	26.879
λ_2	1.352	28.340	28.838
λ_3	4.391	31.538	31.941
Random effects	yes	yes	yes
Log likelihood	-723.204	-704.530	-709.75
Observations	888	888	888

Notes: t statistics in parentheses.

Table 6 Partial effects

	poor/weak	fair	good	excellent
Continuous variables				
Population	0.00005	0.00388	-0.00273	-0.00120
Density	0.00008	0.00660	-0.00465	-0.00204
Tax base	0.00046	0.03660	-0.02577	-0.01129
Excess spending	0.0004	0.00311	-0.00219	-0.00096
Age 0-16	-0.00052	-0.04143	0.02917	0.01278
Age 75+	0.00022	0.01735	-0.01222	-0.00535
Highly qualified	-0.00048	-0.03858	0.02716	0.01190
Religious	-0.00055	-0.04409	0.03104	0.01360
White	-0.00031	-0.02445	0.01721	0.00754
Self-employed	0.00033	0.02675	-0.01883	-0.00825
Financial and RE	0.00046	0.03696	-0.02602	-0.01140
Disabled	-0.00061	-0.04902	0.03452	0.01512
Unemployed	0.00202	0.16164	-0.11381	-0.04985
Dichotomous variables				
Fragmented	0.00391	0.31309	-0.22045	-0.09655
Conservative	0.00315	0.25237	-0.17769	-0.07783
All out elections	-0.00836	-0.29183	0.23218	0.06802
Unitary	-0.00342	-0.22221	0.03471	0.19092
Metropolitan	-0.00263	-0.20120	-0.04046	0.24430
London	-0.00277	-0.20881	-0.12757	0.33915

Notes: partial effects (table 5, col. (f)) are computed according to equation (16) for continuous variables and to equation (17) for dichotomous variables.

Figure 1: Performance determination process