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Modelling Local Government Budgetary Choices under Expenditure Limitation

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I. INTRODUCTION

The analysis of the expenditure decisions of English local authorities has assumed great importance as central government has sought to exercise increasing control over the activities of local government. In particular, in a variety of contexts, central government has sought to estimate from empirical observation what a local authority 'ought' to spend. Unfortunately, such an undertaking is becoming increasingly complex, as the influence of previous government policy itself assumes greater importance in local authority expenditure decisions. For example, central government grant allocations to local authorities are based on a simple statistical analysis of previous spending patterns. These grant allocations will to some extent influence current spending. The expenditure responses in turn are likely to affect future grant allocations, and so the cycle continues. Such circularity formed an important component of criticisms of current local government finance arrangements by the Audit Commission (1993) and the House of Commons Select Committee on the Environment (1994). This paper seeks to underline the difficulties by

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demonstrating the statistical methods that are required to model spending patterns amongst non-metropolitan districts satisfactorily.

The structure of the paper is as follows. Section II gives the background to the paper, including a short history of central government initiatives to curb local authority spending. Sections III and IV describe the system of needs assessments and expenditure limits as applicable to the 296 English non-metropolitan districts. This is followed in Section V by the formal development of our model of expenditure. The methods used to make the empirical application operational are described in Section VI. Results and a discussion in Section VII conclude the paper.

II. BACKGROUND

For much of the time since the election of a Conservative government in 1979, local government expenditure has been at the centre of British political debate. In particular, central government has sought persistently and strenuously to reduce the level of local government expenditure, which accounts for about 11 per cent of gross domestic product. For its part, local government has equally vigorously argued that the need for its services is increasing, and that the scope for efficiency savings is limited. In practice, local government expenditure increased in real terms at the rate of about 2.2 per cent per annum over the period 1979–93 (Smith, 1993).

In its efforts to restrain expenditure increases, central government has introduced a series of policy initiatives directed at English local government, which are described in full in the series of annual reports on local government finance produced by the Association of County Councils (various dates). The most important developments in England have been as follows:

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| 1981–82 | A revision to the system of grants-in-aid to local governments, whereby an explicit ‘grant-related expenditure assessment’ (GREA) was announced by the government for each local authority. The GREA was intended to indicate the government’s estimate of the level of expenditure required to deliver a ‘standard’ level of services, given the locality’s needs, as measured by social and economic indicators. The system of GREAs lasted until 1990. |
| 1982–83 | The announcement by the government of an expenditure ‘target’ for each local authority, based in part on its past expenditure and in part on its GREA (Smith and Stewart, 1985). Expenditure in excess of the target resulted in the loss of grant-in-aid. Targets were abandoned in 1986. |
| 1985–86 | The introduction of ‘rate-capping’, whereby the Secretary of State for the Environment could limit the local tax rate (and therefore the expenditure) of individual local authorities. The limitation was initially applied retrospectively to a small number of jurisdictions. However, since 1991, expenditure limits have been announced in advance for all local authorities. |

- 1986–87 The abolition by the government of the Greater London Council and six metropolitan county councils. Their responsibilities were devolved to individual district authorities or joint boards. The explicit objective of this move was to reduce aggregate local government expenditure (Travers, 1986).
- 1990–91 The replacement of the local residential property tax (the rates) by a ‘community charge’ (the poll tax), and the abolition of the local business property tax. Again, the principal objective was to secure reductions in local government expenditure. At the same time, GREAs were replaced by standard spending assessments (SSAs), which served a similar purpose to GREAs but which were intended to be simpler. The poll tax was a policy disaster (Butler, Adonis and Travers, 1994), and was replaced in 1993 by the council tax. However, SSAs were retained.
- 1991–92 The imposition of prospective expenditure limitation on all local governments, whereby expenditure limits are announced in advance of local authority budgeting.
- 1993–94 The replacement of the poll tax by the ‘council tax’, a form of residential property tax with upper and lower limits, and a 25 per cent discount for single-person households (Department of the Environment, 1991).

Furthermore, for much of this period, the government steadily reduced the proportion of local government expenditure supported by central grant-in-aid, from a level of 55 per cent in 1981–82 to 43 per cent in 1989–90 (Smith, 1993). However, this policy was abruptly reversed with the abolition of the local business rate in 1990–91 and a large injection of central government grant-in-aid in 1991–92 for the purpose of reducing poll tax levels. Approximately 79 per cent of local expenditure is now effectively supported by central grant-in-aid.

The government tried some other initiatives to reduce expenditure, such as a requirement for local authorities to publish comparative performance data. However, these appear to have had a negligible effect. Moreover, the effects of government policies may not always have been as intended. For example, Smith (1989) argues that some of the measures described above may have introduced dynamic incentives for local authorities to *increase* expenditure levels. However, most commentators would agree that — one way or another — much of central government policy towards local government finance has indeed had a profound impact on local government expenditure and services (Butler, Adonis and Travers, 1994).

Two particular developments appear to have had a pervasive effect on expenditure levels. The first is the central role given since 1981 to central government’s estimates of the annual expenditure requirements of individual local authorities, now known as the standard spending assessments. These ‘needs assessments’ were originally used to calculate authorities’ entitlements to grant-in-aid. However, they are now put to a number of other important uses, most importantly setting expenditure limits for local authorities. As documented by the Audit Commission (1993), this has placed an immense burden on the needs assessments in a situation where the determinants of local government expenditure are not yet clearly understood.

TABLE 1

Percentage Variations from Needs Assessments: Non-Metropolitan Districts

<i>Fiscal year</i>	<i>Average variation from SSAs (%)</i>	<i>Standard deviation of percentage variations</i>	<i>Number of capped authorities</i>
1981–82	12.44	22.44	—
1982–83	0.24	23.44	—
1983–84	-1.82	22.08	—
1984–85	3.30	23.34	—
1985–86	3.15	21.04	4
1986–87	-3.72	19.41	2
1987–88	12.19	29.67	4
1988–89	13.01	26.89	4
1989–90	15.99	29.19	1
1990–91	18.36	33.78	2
1991–92	0.01	25.90	21
1992–93	1.64	21.11	162
1993–94	4.97	15.08	168
1994–95	1.89	10.93	122

Prima-facie evidence of the importance of SSAs in determining spending levels is illustrated in Table 1, which shows the distribution of spending in relation to SSA amongst the 296 non-metropolitan districts between 1981–82 and 1994–95. The table illustrates that, since 1991–92 — the first year of universal expenditure limitation — needs assessments and expenditure have converged. As the Audit Commission (1993) explains, much of this convergence appears to have been because SSAs have moved towards expenditure, rather than vice versa. However, the Audit Commission also presents compelling survey evidence that spending in turn is being influenced by SSAs.

The second development on which we focus is the universal expenditure limitation now in force. The last column of Table 1 gives the number of local authorities that have been directly affected by expenditure limitation. Up to 1990–91, such limitation was imposed retrospectively, and the rules for a local authority qualifying for limitation were not known in advance of budgeting. As a result, many local authorities that were not formally subject to limitation may nevertheless have adjusted spending levels to avoid being caught by expected limitation rules. Since 1991, the rules have been announced in advance of budgeting, and the table therefore gives the number of authorities spending

within 0.1 per cent of their expenditure limit.² Again, the fact that many local authorities spent up to their limits is clear prima-facie evidence that expenditure limitation has affected many budgeting decisions.

The profound impact of central government policy on expenditure choices can be confirmed by casual observation of budgeting debates within almost any local authority and by observational case studies (Elcock and Jordan, 1987). It would therefore appear that any attempt to study spending patterns in local government should take full account of central government policy influences on local government spending choices.

There are many reasons why it may be desirable to gain a thorough understanding of all the influences on local authority expenditure choices. For example, in calculating an authority's SSA, central government has attempted to identify the local costs of delivering a 'standard' level of services. In order to do this, it first identifies a set of *drivers* of expenditure needs — or standard spending indicators — which are typically measures of demographic and socio-economic circumstances (Society of County Treasurers, 1992). A link must then be made between these 'needs indicators' and an expected spending level, required to satisfy those needs with some standard level of service. This link is usually established using statistical techniques — typically regression-based methods — an approach which implicitly assumes that the national average response to needs indicators reflects the standard level of service (Department of the Environment, 1995).³

Similarly, a strong understanding of expected spending levels is required by the Audit Commission, the body charged with promoting the economy, efficiency and effectiveness of local authorities. The Audit Commission will often find it helpful to assess the spending needs in an area as a prelude to coming to a judgement about the relative performance of the local authority. In order to do this, it may wish to abstract as far as possible from government policy influences on spending amongst the local authority of interest and the local authorities with which it might be compared.

The traditional method of assessing local authority expenditure responses to central government policy is to build conventional economic models in which a local authority utility function (typically reflecting the utility of a representative voter) is maximised subject to the relevant local authority budget constraint

² Strictly speaking, authorities were only considered for expenditure limitation if their chosen budgets exceeded the government's limits. However, it is safe to assume that, although only a handful of authorities formally breached the limits in this way, many others chose to conform to their limits principally to avoid confrontation with the government. We use a cut-off of 0.1 per cent because many authorities spent just marginally less than their limits, but were almost certainly influenced by the limit in their choice. We experimented with alternative cut-offs and found little change in results.

³ This national average will indicate relative needs between authorities. These are likely to be scaled up or down according to how much aggregate expenditure central government is prepared to allocate to the service in question.

(Foster, Jackman and Perlman, 1980). This method lends itself to empirical estimation, and numerous models of local government expenditure responses in the 1980s have been developed (Barnett, Levaggi and Smith, 1992). Underlying these models is the assumption that the finance system is given exogenously, and that local authorities myopically seek to maximise some measure of utility within that system. However, from the discussion above, it is clear that, in practice, central government policy may itself have been in part formed by local government expenditure responses. That is, using the econometric jargon, some parts of the finance system may be endogenous.

This being the case, conventional methods of analysing local authority expenditure are likely to be inadequate. The purpose of this paper is to model the determinants of local expenditure using the principles outlined above, but taking account of possible endogeneity. Furthermore, we must accommodate the truncated budget constraint brought about by expenditure limitation. This complication alone renders conventional regression methods inappropriate. Therefore, as well as altering the form of the model, these considerations considerably complicate the estimation methods needed for empirical purposes. The outcome of the analysis is a model of expenditure that seeks to explain the importance of the following factors in forming expenditure choices: needs assessments, expenditure limits, local income levels, and other socio-economic factors. As a prelude, the next two sections describe in more detail the two important factors described above: standard spending assessments and expenditure limitation.

III. STANDARD SPENDING ASSESSMENTS

As noted above, SSAs have played a pivotal role in central government's attempts to restrain local expenditure. Originally they were intended 'to represent the amount of revenue expenditure which it would be appropriate for the authority to incur in that year to provide a standard level of service consistent with the Secretary of State's view of the amount of revenue expenditure which it would be appropriate for all local authorities to incur' (Association of County Councils, 1990). In a recent change, the government has redefined the SSA to be 'the amount which the Government considers appropriate for each authority to calculate as its budget requirement ... consistent with the amount the Government considers it would be appropriate for all authorities to incur' (Department of the Environment, 1995). This definition explicitly omits mention of 'standard' levels of service. However, such standards continue to be implicit in the methodologies adopted. In practice, SSAs (i) serve as a bench-mark for assessing the level of a jurisdiction's overspending, (ii) are central to the calculation of an area's entitlement to grant-in-aid and (iii) have become the primary determinant of an area's expenditure limit.

Separate SSAs are calculated, using a variety of methodologies, for the following services: education, personal social services, police, fire, highways, capital financing, and a heterogeneous group of all 'other' services, which include refuse collection, planning and economic development, housing, and various administrative services. The 296 non-metropolitan districts in England — the subject of this study — are not responsible for any of the first five services, and so the only SSAs relevant to this study are the capital financing SSA and the other services SSA.

The capital financing SSA is a relatively minor item, relating to £170 million of non-metropolitan district expenditure in England in the year under study (1992–93). The principal determinant of a district's capital financing SSA is the previous level of its debt. The other services SSA, however, accounts for £2,605 million across England, and is therefore by far the more important component of a district's total SSA.

In the year to be studied, the basic component of the other services SSA was the total population of a local authority area. This was then weighted by a 'needs' index, which in 1992–93 had three important components: a measure of the density of the area, a measure of the sparsity of population,⁴ and an 'all ages social index' comprising a linear combination of the following five social variables from the 1981 Census of Population (Society of County Treasurers, 1992):

- the proportion of persons sharing accommodation;
- the proportion of persons lacking a bath or WC;
- the proportion of persons in lone-parent households;
- the proportion of persons with more than one person per room;
- the proportion of persons whose head of household was born in the New Commonwealth or Pakistan.

The five variables forming the all ages social index were standardised and summed (they were therefore effectively given an equal weight in the index). The index was then combined with the density and sparsity measures to yield the district's needs weighting.

The choice of the three factors in the calculation of the SSA (and the relative weights given to them) is a policy decision that emerges from discussions between central and local government, but in practice such decisions are heavily influenced by past actual spending patterns. Indeed, there has been considerable unease about the methodology used to calculate SSAs, culminating in a report by the House of Commons Select Committee on the Environment (1994). In particular, the Committee highlighted the 'growing danger of circularity'

⁴ Density is defined as the average population density of wards, weighted by ward populations. Sparsity measures the proportion of the population living in low-density wards. Full details are given by the Society of County Treasurers (1992).

between SSAs and actual spending, described in our opening paragraph. For this reason, if the SSA is entered in any model of expenditure choices, it is important to accommodate the possibility that it may be determined endogenously.

A local authority's total SSA is used to calculate its entitlement to central government grant-in-aid as follows. Central government chooses a national standard tax rate, t^* , to apply to all local authorities. Then the grant entitlement, G_i , of authority i is as follows:

$$(1) \quad G_i = \text{SSA}_i - t^* \cdot \text{RB}_i$$

where RB_i is the resource base available to authority i . Thus the grant is intended to compensate for the difference between an authority's assessed need (SSA) and its ability to raise the necessary finance using a standard rate of taxation. The grant system therefore simultaneously equalises for differences in assessed spending needs and differences in resources between authorities.

IV. EXPENDITURE LIMITATION

The government assumed the power to limit the tax rates (and therefore effectively expenditure) of local governments in the 1984 Rates Act. Criteria for capping individual authorities' tax rates were announced after budgets had been set. The powers were first invoked in 1985–86, when 18 local governments (including four non-metropolitan districts) were instructed to reduce their tax rates. Similar numbers were affected in each of the following four years. With the introduction of the poll tax in 1990–91, again only 14 (including just two non-metropolitan districts) were affected. However, in the second year of the poll tax, the government decided to announce in advance expenditure limits for all authorities.⁵ This policy has been continued every subsequent year. In 1992–93, the expenditure limits were calculated as follows:

- the limit was to be the previous year's budget plus 6.5 per cent unless the resulting figure was more than 5 per cent over the current SSA, in which case:
- the limit was to be the previous year's budget plus 4.5 per cent unless the resulting figure was more than 10 per cent over the current SSA, in which case:
- the limit was to be the previous year's budget plus 2.5 per cent.

⁵ In fact, in 1991–92, authorities budgeting to spend less than £15 million were exempt from capping. This criterion applied to a large number of non-metropolitan districts, the subject of this study. However, in subsequent years, this lower limit was removed.

Moreover, there were some additional overriding criteria, of which the most important was:

- no expenditure limit was to exceed the current SSA by more than 12.5 per cent; with the reservation that:
- no limit was to be more than 10 per cent below the previous year's budget.

Local government cost inflation at the time was approximately 6.6 per cent. Full details are given by the Association of County Councils (1992, p. 129).

All authorities were expected to conform to the expenditure limits. However, 10 local authorities (including five non-metropolitan districts) chose to set budgets significantly in excess of their limits. The Secretary of State examined each of these on an individual basis, and instructed them to reduce their expenditure to what he considered a reasonable level (which was, in three cases, above the original limit).

V. A MODEL OF LOCAL EXPENDITURE

The basic model to be employed assumes that the utility, U , of a representative voter in local authority i depends on the level of expenditure, x_i , adopted (a proxy for local services provided) and some measure of the level of local taxation, t_i . In order to build an empirical model, we must choose a particular form of utility function, and we follow the conventional practice of assuming that U can be represented by the equation

$$(2) \quad U(x_i, t_i) = \alpha_1 \ln(x_i - N_i) + \alpha_2 \ln(Y_i - t_i)$$

where N_i is a measure of baseline expenditure needs in jurisdiction i , Y_i is income and the parameters α_1 and α_2 are common across all jurisdictions. Throughout, we assume that all variables are measured in per capita terms.⁶

The government supports each authority i with a lump-sum grant-in-aid, intended to equalise for differences in spending needs and fiscal capacity between authorities. Thus the budget constraint of local authority i is given by

$$(3) \quad x_i = G_i + t_i$$

where G_i is the per capita grant.⁷

⁶ We do not explicitly consider variations in the price of local services in this paper. In the empirical section, we accommodate potential variations in price by including a dummy for the south-east of the country. London authorities were not included in the analysis.

⁷ Under a poll tax of the sort in operation in 1992–93, the tax burden is only borne by qualifying adults who comply with the tax, while the benefits of expenditure are enjoyed by all. In principle, this refinement could readily be built into our model. In practice, it considerably complicates the empirical estimation, and so was not

Maximising utility subject to the budget constraint yields the expenditure equation

$$(4) \quad x_i = \frac{\alpha_1 Y_i + \alpha_2 N_i + \alpha_1 G_i}{\alpha_1 + \alpha_2}$$

That is, per capita expenditure in authority i is a function of local income (Y_i), needs (N_i) and central government grant (E_i). Note that using this model, SSA does not enter the expenditure equation explicitly. However, it does so implicitly, as, from equation (1), a £1 change in SSA implies a £1 change in grant. Note also that central government grant is effectively treated as being equivalent to a simple augmentation of private income.

In the past, most researchers have used ordinary least squares techniques to estimate such models (see, for example, Barnett, Barrow and Smith (1991)). In the English context, however, as noted in Section III, a case can now be made for considering the grant variable to be endogenous, and we present a test for such endogeneity in this paper. Moreover, we must also accommodate the expenditure limitations imposed by central government. These effectively allow central government to impose the simple additional constraint

$$(5) \quad x_i \leq L_i$$

on local authority i , where L_i is the expenditure limitation imposed on the i th authority by central government. Under these circumstances, it may be the case that the *desired* level of expenditure, x_i , noted above cannot be secured, in which case the *observed* level of expenditure, y_i , will be as follows:

$$(6) \quad \begin{aligned} y_i &= x_i & \text{if } x_i \leq L_i \\ y_i &= L_i & \text{if } x_i > L_i. \end{aligned}$$

VI. THE EMPIRICAL ESTIMATION

This section describes the empirical application to the English non-metropolitan districts. Ordinary least squares regression methods are inadequate to estimate the model shown above. Instead, a three-stage estimation procedure must be adopted. This is described in full elsewhere (Duncan and Smith, 1995). In summary, it is as follows.

considered.

(a) First, using a subset of variables describing local socio-economic and political characteristics, a model is developed that seeks to predict whether or not a local authority is capped — that is, whether its expenditure choice has been constrained by the central government limit. This is termed the selectivity model. In the year examined, 162 of the 296 authorities spent at or within 0.1 per cent of their expenditure limit.

(b) Using a non-identical subset of the environmental variables (or instruments), the expected level of central government grant paid to an area is modelled.

(c) The expenditure equation (4) is estimated taking into account the selection for limitation implied by (a) and the endogeneity correction implied by (b). This yields parameter estimates and predictions that model the *desired* level of expenditure in each local authority.

We take per capita expenditure and grant from local authority budgets for 1992–93 from the Chartered Institute of Public Finance and Accountancy (1992). Income data are not directly available. However, we were able to draw on work by Bramley and Smart (1993) in which median household weekly incomes for English districts were inferred from published data based on the 1991 Family Expenditure Survey. We use these data as a proxy for annual per capita income. Because they are not directly comparable to grant data, we allow the coefficients on grant and income to differ. The components of needs, N_i , are unknown. However, we had available a set of socio-economic indicators from the 1991 Census of Population which could serve as possible candidates as needs indicators. They were as follows:

Economic:	unemp	Percentage of economically active unemployed
	l_t_unem	Percentage of unemployed out of work for at least one year
	moving	Percentage of residents moving into district in last year
	no-car	Percentage of residents living in households with no cars
	lone_p	Percentage of population living in lone-parent families
Social:	notstud	Percentage of those aged 17 who are not students
	sc3-5	Percentage of population in households of social class 3, 4 or 5
	no_qual	Percentage of population with no formal qualifications
	non_white	Percentage of population in non-white ethnic group
Health:	illness	Percentage of population with limiting long-standing illness
	smr	Standardised mortality ratio
	lbw	Number of births less than 2.5kg per 10,000 live births

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Housing:	shared	Percentage of population in shared accommodation
	no_ch	Percentage of population with no central heating
	no_fac	Percentage of population without exclusive bath or WC
	crowded	Percentage of population living more than one person per room

These variables served two purposes. First, subsets of them served as instruments for modelling grant selection for capping (stage (a) of the modelling process) and the level of grant (stage (b)). Second, they were potential needs variables. Equation (4) was therefore estimated including a subset of the 16 socio-economic variables, which represented the needs variable, N_i . The choice of variables for this purpose was determined by the desire to keep the model as parsimonious as possible, subject to the econometric specification being satisfactory.

In addition to the above variables, we included in the analysis the political control of the local authority: overall Conservative control; overall Labour control; and other (no overall control or other party control). These were used as dummy variables, both on the intercept term and on the coefficients of socio-economic variables.

In making the model operational, a number of modelling decisions had to be taken. First, a set of variables was required to model the probability of an authority being capped, stage (a). A number of alternative sets were tested. The version reported here uses the explanatory variables indicated in the 'selection equation' column of Table 2. They were chosen principally on the basis of their success in modelling whether or not an authority spent at or within 0.1 per cent of its expenditure limit. This model successfully predicts the status of 69 per cent of the 296 authorities.

Next, a vector of instruments was required to model grant, as in stage (b). The choice here was more straightforward, being guided by the variables used to calculate an authority's SSA. The instruments in the 'endogeneity equation' column of Table 2 were therefore used. This equation is a good model of grant, with an adjusted R^2 of 0.916.

The final stage of the modelling was to estimate the structural model (equation (4)) using the methods described above. The preferred model is shown in Table 3. It contains grant, income and political control. In addition, it was found that limiting long-term illness and the percentage aged 17 who were not at school were the most important 'needs' variables. None of the other potential needs variables entered the model with any statistical significance at the 5 per cent level. Furthermore, the inclusion of political dummy variables interacting with needs variables was found to be unnecessary. The other variables included in the model were: first, the synthetic 'hazard' variable, generated from stage (a), which indicates the relative risk of being selected for expenditure limitation; and second, the grant residual (see Table 3) which corrects for any endogeneity that may be present in the grant variable. Neither of these was found to be

TABLE 2
Reduced Form Estimates of Selectivity and Endogeneity Equations

Variable	Selection equation		Endogeneity equation	
	<i>Estimate</i>	<i>Standard error</i>	<i>Estimate</i>	<i>Standard error</i>
Constant	4.749	1.553	-9.558	2.009
Sparsity 1	-1.866	0.786		
Sparsity 2	-1.042	0.534		
% aged 17 not students	-0.019	0.015		
% with no car	0.041	0.031		
% in lone-parent families	-0.115	0.179	5.023	0.708
% moving in last year	-0.299	0.088		
% unemployed	-0.109	0.080	1.046	0.274
Standardised mortality	-0.017	0.013		
% low birth weight	0.009	0.009		
Conservative control	-0.543	0.201		
Labour control	0.591	0.265		
% non-white ethnic group			1.095	0.175
% in shared accommodation			1.054	1.203
% without exclusive facilities			17.857	1.652
% in crowded accommodation			3.067	0.542
South-east dummy			-1.562	0.773
Sparsity 3			34.847	2.371
Ward-weighted density			7.717	0.658
Number of observations		296		
LR $\chi^2(9)$		61.18		
% correctly predicted		68.92		
Adjusted R ²			0.916	
F(9,286)			360.4	

statistically significant. Standard errors were adjusted first for heteroskedasticity using White's correction, and then for the hazard of being selected for expenditure limitation. The last column of Table 3 therefore presents the statistically satisfactory standard errors.

The results suggest that the level of central government grant is indeed an important determinant of expenditure levels, as is Labour Party control. Of the needs indicators, the level of long-standing illness is clearly the most important determinant of spending. However, we were unable to detect any statistically significant effect of income on local government spending levels. The distinction identified between the impact of central government grant and that of local

TABLE 3
The Structural Model

<i>Variable</i>	<i>Estimates</i>	<i>OLS standard errors</i>	<i>White adjusted standard errors</i>	<i>Correction for hazard</i>
Constant	16.501	25.209	30.006	31.841
Grant	0.596	0.101	0.139	0.147
Income	0.014	0.033	0.038	0.040
Conservative	-1.847	3.362	3.653	3.726
Labour	18.384	6.352	7.814	9.364
% with illness	3.751	1.006	1.415	1.524
% aged 17 not students	-0.687	0.241	0.317	0.338
Hazard rate	8.960	5.442	5.600	6.219
Grant residual	0.008	0.276	0.232	0.244
Number of observations			134	
Adjusted R ²			0.521	
F(6,127)			25.063	

incomes on spending is clear evidence of the ‘fly-paper’ effect of central government grants (Barnett, 1985), in the sense that grant appears to stimulate expenditure to a far greater extent than private income.

By way of comparison, Table 4 shows the model that would have been estimated if no account had been taken of the selectivity implicit in the truncated budget constraint, or of the potential endogeneity of grant. It is an ordinary least squares estimation of equation (4) using all 296 authorities, and yields very different estimates of many of the parameters. In particular, it implies a stronger impact of grant than the model in Table 3. Furthermore, the weak significance of the ‘student’ variable suggests that it would not have been selected as a needs variable using conventional regression methods, so that faulty inferences about the needs determinants of local government expenditure may have been made if this methodology had been pursued.

VII. CONCLUSIONS

The correct modelling of local government expenditure choices is fraught with difficulty, particularly given the strong influence of central government policy decisions. This paper has sought to show how aggregate expenditure in one class of authorities might be modelled. It shows that naïve ordinary least squares (OLS) regressions of expenditure on potential explanatory variables are inappropriate, and may give rise to faulty inferences about the determinants of expenditure. This conclusion should be considered in the light of current government methodologies for estimating local authority spending needs, which

TABLE 4
Ordinary Least Squares Version of the Structural Model

<i>Variable</i>	<i>Estimates</i>	<i>Standard errors</i>
Constant	2.153	18.769
Grant	0.782	0.065
Income	0.037	0.024
Conservative	-4.201	2.517
Labour	11.198	3.118
% with illness	2.371	0.717
% aged 17 not students	-0.105	0.173
Number of observations		296
Adjusted R ²		0.551
F(6,289)		61.266

rely heavily on OLS methods. Since the year studied in this paper, the influence of central government limitation on local government expenditure has become even more pervasive, so that even the more advanced methods described here may not now yield fruitful results. Indeed, there is a paradox at the heart of the government's efforts to identify 'objective' measures of spending needs. The more important those estimates become, the more they influence local spending, and the more it becomes impossible to identify independent determinants of expenditure levels. We would therefore suggest that the entire principle of estimating local government spending needs on the basis of naïve statistical methods is now fatally compromised, and that a fundamental review of needs assessment methodology is urgently needed.

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