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FISCAL ILLUSION AND THE DEMAND FOR LOCAL GOVERNMENT EXPENDITURES IN ENGLAND AND WALES

by

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Abstract

This paper examines a public choice model of fiscal illusion in the demand for local government goods applied to local government expenditures in Britain. Data for two fiscal years, 1991/92 and 1993/9, are used reflecting two very different local tax regimes – the Community Charge in 1991/92 and the Council Tax in 1993/94. The principal evidence for fiscal illusion is the demonstrable flypaper effect under both tax regimes: a unit increase in grant is associated with a far larger increase in per capita local expenditure (about 0.75 of a unit) than is a comparable unit increase in average income (less than 0.2 of a unit). There is no consistent evidence of renter illusion. In comparing the two tax regimes we find that both taxes achieved the same degree of accountability, so that a flat rate tax is not necessary for accountability. We find evidence that taxpayers on higher incomes appear willing to pay higher taxes, even if the higher expenditures benefit those on lower incomes. The Community Charge stifled this desire for equity. As the Council Tax appears as accountable and more equitable than the Community Charge, we conclude that it is, on public choice grounds, a better local tax.

1 INTRODUCTION

A distinguishing feature of British local government finance over the past ten years or so has been the series of major changes to the form of local tax levied on individuals (or households). A domestic property tax was replaced in April 1990 by an essentially flat rate Poll Tax (the Community Charge) which in turn was replaced in 1993 by a mildly progressive tax based on property value bands (the Council Tax). These 'experiments' proved fruitful for applying public choice theories, especially of fiscal illusion (the argument that taxpayers consistently underestimate the true tax cost of public goods, hence demand 'too much' public expenditure). The introduction of the Community Charge was presented as a measure to reduce fiscal illusion and thereby increase local accountability, as local taxpayers would know their liability (and that of others in the local authority). However, a careful analysis of the equity and efficiency implications of the Community Charge combined with the mechanism of allocating central grants suggests that fiscal illusion would persist (Cullis *et al*, 1993a). Cullis *et al* (1991) argued that if median voters have imperfect knowledge of how grants and local taxes interact, public perceptions of the Community Charge could induce increased fiscal illusion. This paper tests for fiscal illusion under the Community Charge and its replacement, the Council Tax.

There are at least five possible sources of fiscal illusion in local taxation. First, and perhaps most important, is the so-called 'flypaper effect' which hypothesises that central grants 'stick where they hit'. If the median voter (correctly) perceives a grant as equivalent to an increase in the voter's income, the effect of the grant should be the same as that of an increase in income - the 'equivalence theorem' (Bradford and Oates, 1971). However, much empirical evidence suggests that the effect of grants on spending is much greater than that of income - the flypaper effect (e.g. Grossman, 1990; Heyndels and Smolders, 1994; Oates, 1991b; Turnbull and Djoundourian, 1994). While evidence supports this flypaper effect in British local government, interpretations differ. Barnett *et al* (1991) demonstrate that the effect can be observed even if voters correctly perceive the budget constraint, whereas Cullis *et al* (1991, 1993a) argue that the effect arises because voters misperceive the budget constraint. All agree that the effect arises.

A second source of fiscal illusion in local finance, of particular relevance to the British case, is renter illusion. If the local tax is property-based then it has been argued that only those who pay it are likely to correctly perceive the local tax-price, so renters may feel they do not pay the full tax price and therefore vote for higher expenditures (Goetz, 1977). Such an argument was made to justify the introduction of the Community Charge: only the heads of owner-occupied households were liable for property rates, hence more than half of voters were not liable. Cullis *et al* (1993b) reject this claim on the basis that the tax will be perceived as a household tax (thus concerning members other than the head) and is built into rents. In their study of Belgium, Heyndels and Smolders (1994) found no evidence of renter illusion, although evidence has been found for the US (Bergstrom and Goodman, 1973).

A third source of fiscal illusion is debt illusion. If Ricardian equivalence does not prevail, taxpayers will discount the future tax liabilities associated with debt finance of current expenditures. This is a variant of the flypaper effect, with debt in place of grants. Central government in Britain curtailed the ability of local authorities to incur debt, certainly over the period of our study, so this effect is unlikely to be significant. In fact, Ashworth and Gemmell (1996) show that indebted local authorities tended to take advantage of the introduction of the Community Charge to increase local tax rates, perhaps aware of the constraint to future debt financing. As central government could be blamed for the tax, local politicians had a monopoly power that permitted a 'one-off' increase in local taxes when the new tax was introduced (see also Cullis *et al*, 1993a). Not all authorities exercised this power, but the Community Charge tended to be higher in those authorities with higher debt (Ashworth and Gemmell, 1996: 408).

Two other sources of fiscal illusion are of less direct relevance to local government in Britain. The revenue complexity hypothesis suggests that the more varied sources of tax there are the more difficult it is for taxpayers to know their liability. Under the British system there was only one local tax on individuals. Although there is a local business tax (non-domestic rates), since the Community Charge regime central government set the rate, collected the revenue and redistributed it to local authorities. In this sense it is comparable to a grant. Revenue elasticity is a fifth source of fiscal

illusion, if tax revenue is income elastic. This is not relevant to British local taxes as they are set independently of income changes.

Local government finance has proved to be a useful testing ground for theories of fiscal illusion. In a review of the literature, Dollery and Worthington (1996) identify six studies of the flypaper effect using local cross-section data (compared to four using national level time series data), fifteen studies of renter illusion (fourteen using local cross-section data), four of debt illusion (all local), thirteen of revenue complexity (ten based on local data), and ten of revenue elasticity (all local). Despite this activity, the results are mixed. Of particular relevance to us, there is fairly strong support for the flypaper effect and renter illusion, although the majority of studies cited are North American, where the features of local government are very different to Britain.

In this paper we use a median voter model and test for the existence of fiscal illusion under the Community Charge and Council Tax regimes. The opportunity to compare two tax regimes in the same cross-section of authorities, and only one year apart, allows us to address some important issues. The Community Charge was intended to establish local accountability by ensuring that the liability of all taxpayers in an authority was known (and equal) and by announcing a direct link between increased local tax (above a 'standard level') and higher local expenditure (see Cullis *et al*, 1991, 1993a). If the local Community Charge was set at a level above the standard announced for that authority, this implied that the authority was spending more than the standard. Similarly, if an authority wanted to spend above the standard, it had to raise taxes to finance this. Thus, so the argument went, local voters (who would be paying the same local tax) would be able to see the link between higher taxes and higher spending. There would be no fiscal illusion; if an authority spent (and taxed) above the standard, it would be because electors chose to condone it (see Ashworth and Gemmell, 1996). We can test if the Community Charge achieved this objective in two ways. First, we test for evidence of fiscal illusion under the Community Charge. Second, we test for fiscal illusion under the Council Tax (that does not have these specific accountability features), that is predicted to be greater than under the Community Charge due to lower accountability (see Barnett and Knox, 1992).

The expectation of central government in introducing the Community Charge was that high local tax rates would motivate local accountability and high spending authorities would lose power in local elections. The reality was that voter opposition was directed at the central government that introduced the tax, largely because a flat rate poll tax was perceived as unfair (Cullis *et al*, 1993, 1993b). Perhaps, as Hudson and Jones (1994) suggest, the revealed preferences of voters will display some altruism, i.e. there are 'ethical voters' who will place the public interest before self-interest, hence the opposition to a tax perceived as inequitable. The Council Tax has not attracted strong public opposition, perhaps because it embodies some equity. We attempt to address this issue by incorporating an indicator of local income distribution in our regressions.

The paper is structured as follows. Section 2 presents our public choice model of the demand for locally provided goods and services, which incorporates representations for a number of possible sources of fiscal illusion. Section 3 then presents our data for 54 local authorities in England and Wales, covering the fiscal years 1991/92 (when the Community Charge was in place) and 1993/94 (when the Council Tax had been introduced), and describes our measures of fiscal illusion. The empirical results are discussed in Section 4, and Section 5 provides a summary with concluding comments.

2 LOCAL PUBLIC SPENDING AND FISCAL ILLUSION

Recent public choice approaches to local government finance have emphasised that the combination of local taxes and central grants is likely to give rise to voter misperceptions of the tax-price of local public goods (Goetz, 1977). This fiscal illusion causes voter-taxpayers to underestimate the tax-price and vote for higher levels of government expenditures (Oates, 1991a). This has spawned numerous empirical studies of fiscal illusion and the demand for locally provided public goods (reviewed by Dollery and Worthington, 1996). The majority of studies take the decisive voter as being the voter with median income (Holcombe, 1989). While a number of authors have compared results using mean and median income (e.g. Inman, 1978; Turnbull and Djoundourian, 1994), these studies did not specifically relate to fiscal illusion. In an attempt to assess which is the more appropriate to represent the decisive voter, we compare results based on both median and mean income under both local tax regimes.

The early studies applied standard demand theory with voter-taxpayers assumed to maximise utility from private and (local) public goods subject to a budget constraint (Borcherding and Deacon, 1972; Bergstrom and Goodman, 1973). The voter-taxpayer *i*'s demand for local government provided goods is hypothesised to depend on *i*'s income, *i*'s tax-price, and a vector of local taste variables:

$$G_i = a\, Y_i^{\alpha}\, P_{gi}^{\beta}\, Z^{\lambda}\ ,\ i=1,2,...,N \qquad (1)$$

where G_i is *i*'s consumption of government-provided goods, Y_i is *i*'s disposable income, P_{gi} is *i*'s (true) tax-price for G_i, and Z is a vector of taste variables. The α, β and λ are elasticities. The price of private goods is assumed to be similar across localities and is normalised at unity. Multiplying both sides by P_{gi}, the following specification is obtained:

$$E_i = a\, Y_i^{\alpha}\, P_{gi}^{\beta+1}\, Z^{\lambda} \qquad (2)$$

where E_i ($=P_{gi}\, G_i$) is *i*'s demand for local government expenditures. The tax-price is defined by Borcherding and Deacon (1972) and Bergstrom and Goodman (1973) as '$P_{gi} = T_i\, C\, N^{\eta}$', where T_i is *i*'s tax share, C is the unit cost of G, and N is population with the degree of publicness measured by η. Substituting for P_{gi} in (2), yields:

$$E_i = a\, Y_i^{\alpha}\, (T_i C)^{\beta+1}\, N^{\eta(\beta+1)}\, Z^{\lambda} \qquad (3)$$

An important issue is the measurement of the tax-price. Due to an absence of data on C, Bergstrom and Goodman (1973) were forced to assume that the ratio of prices of public to private goods differs little between local governments. Thus, implicitly C=1, and the tax-price is $P_{gi} = T_i\, N^{\eta}$. They then compute the tax bill on the house of median value. This is divided by total property tax revenue for the municipality to

produce an estimate of the share of the real property taxes paid by the consumer with median income, T_i.[1]

Such a specification adopts the theory of democratic process in which it is assumed that citizens are fully aware of the costs and benefits of government-provided goods. However, if voter-taxpayers are subject to fiscal illusion due to some characteristics of local taxation, their demand for local public spending will depend on the perceived tax-price rather than the "true" tax price. The perceived tax-price may be defined as $\hat{P}_{gi} = \Phi_i P_{gi}$, where Φ_i is a 'perception parameter' for individual *i*, hypothesised to be a function of the local fiscal structure. In this paper, three relevant features are considered: the flypaper effect, renter illusion, and local accountability. Let Φ_i be a function of these features as follows:[2]

$$\Phi_i = (FLY)_i^{\pi_1} (REN)^{\pi_2} (ACN)^{\pi_3} \qquad (4)$$

where FLY_i is per capita central grants, *REN* is as the ratio of renters to the local population, and *ACN* is the ratio of local non-taxpaying adults to local taxpayers. These three variables are proxies for the flypaper effect, renter illusion, and local accountability respectively. Substituting the perceived tax-price ($\hat{P}_{gi}$) for the tax-price (P_{gi}) in equation (2), the model to be estimated becomes:

$$\begin{aligned} lnE_i = {} & lna + \alpha\, lnY_i + (\beta+1)\, ln(T_iC) + \eta(\beta+1)\, lnN \\ & + \delta_1\, lnFLY_i + \delta_2\, lnREN + \delta_3\, lnACN + \lambda Z + u \end{aligned} \qquad (5)$$

where $\delta_1 = \pi_1(\beta+1)$, $\delta_2 = \pi_2(\beta+1)$, and $\delta_3 = \pi_3(\beta+1)$.

The sign predictions for our variables are as follows. Income per capita (Y_i) is expected to have a positive effect on the demand for local public spending, while a

[1] The case of the UK will be discussed in the next section. It is also assumed that the consumer with the median income pays the same share of other municipal revenues as s/he does of the property tax. This is purely an assumption of convenience that should be modified wherever better information is available.

combination of the coefficients for tax share (T_i) and population (N) will provide some measure of the degree of publicness. FLY_i, *REN*, and *ACN* are expected to have positive effects if the alleged fiscal illusions operate. Furthermore, a coefficient on FLY_i greater than that on Y_i is expected if the flypaper effect exists.[3]

3 DATA AND MEASURES OF FISCAL ILLUSION

The local government data used in this paper are for England and Wales (Scotland has a different system and is excluded) in 1991/92 and 1993/94 for 39 non-metropolitan counties and seven metropolitan counties in England, and eight non-metropolitan counties in Wales (listed with Table 1). Local government expenditures (LGE) per capita are computed by dividing the total local government expenditures by local population. Table 1 shows that the mean of per capita local government expenditures in all counties is about £603 in 1991/92. Greater London is the (metropolitan) county with the highest per capita LGE at about £975, while Dorset has the lowest at about £557. The figures exhibit a similar pattern in 1993/94. Metropolitan counties have substantially higher per capita LGEs on average than all counties in England and Wales as a whole. As expected, the county average for median income is lower than the county average for mean income both in 1991/92 and in 1993/94. There is a substantial range of mean (and median) income values across local authorities, the highest mean income in 1991/92 for example being Surrey with £18,700, and the lowest Dyfed with £9,920.

[2] Other fiscal illusion arguments, such as tax elasticity, tax complexity and the invisibility of indirect taxes are not included here because they are irrelevant in the case of local governments in the UK.
[3] If the equivalence theorem is true we would expect to obtain equal coefficients on both variables, meaning that the receipt of an additional £ of central grant by a local authority is analogous, in expenditure effects, to the receipt of an additional £ by the median income earner.

	Local Expenditure (£, per capita)		**Mean Income** (£, per capita)		**Median Income** (£, per capita)	
	1991/92	1993/94	1991/92	1993/94	1991/92	1993/94
England and Wales (all counties)	602.5	667.2	13,260	13,796	10,417	10,813
England (non-metropolitan)	560.8	622.6	13,644	14,100	10,670	10,960
Wales (non-metropolitan)	701.3	711.6	11,728	12,563	9,290	10,133
Metropolitan Counties	722.2	865.0	12,871	13,514	10,294	10,770

Notes: The figures are mean values for the 54 local authorities (counties) in England and Wales. The metropolitan counties in England are Greater London, Greater Manchester, Merseyside, South Yorkshire, Tyne and Wear, West Midlands, and West Yorkshire. The non-metropolitan counties in England are Avon, Bedfordshire, Berkshire, Buckinghamshire, Cambridgeshire, Cheshire, Cleveland, Cornwall, Cumbria, Derbyshire, Devon, Dorset, Durham, East Sussex, Essex, Gloucestershire, Hampshire, Hereford & Worcester, Hertfordshire, Humberside, Isle of Wight, Kent, Lancashire, Leicestershire, Lincolnshire, Norfolk, Northamptonshire, Northumberland, North Yorkshire, Nottinghamshire, Oxfordshire, Shropshire, Somerset, Staffordshire, Suffolk, Surrey, Warwickshire, West Sussex, Wiltshire. The non-metropolitan counties in Wales are Clwyd, Dyfed, Gwent, Gwynedd, Mid Glamorgan, Powys, South Glamorgan, West Glamorgan.

Source: CIPFA (1991-94); Municipal Yearbook (1991-1995).

The three major categories of local government revenues in the UK are local taxes (community charge (CC) in 1991/92 and council tax (CT) in 1993/94), non-domestic rates (NDR), and revenue support grants (RSG). As seen in Table 2, about 27% of local government expenditure was financed through the CC in 1991/92, while the CT ratio was about 25% in 1993/94. The proportion of expenditure contributed by NDR is around 40% in 1991/92, falling to 30% in 1993/94 (note that NDR also fell in absolute terms). Conversely about 33% of local government expenditure was financed by the RSG in 1991/92, and increased to around 46% in 1993/94.

In English non-metropolitan counties, the NDR provides the highest proportion of local government expenditures in 1991/92, followed by CC while RSG provides the lowest share. On the other hand, in Wales the highest proportion of local government expenditures is financed by RSG followed by NDR and CC. The relative shares of the three categories of local government revenues remain roughly the same in 1993/94 for Wales, while the RSG becomes more important in England.

Table 2 Local Government Revenues in England and Wales

	All counties (£ million)		**England** (non-metropolitan) (£ million)		**Wales** (non-metropolitan) (£ million)		**Metropolitan Counties** (£ million)	
	1991/92	1993/94	1991/92	1993/94	1991/92	1993/94	1991/92	1993/94
EXPENDITURE [1]	605.2	684.1	432.5	482.8	251.5	255.7	1971.4	2294.9
Local taxes [2]	164.7 (0.27)	171.0 (0.25)	139.7 (0.32)	142.1 (0.29)	31.5 (0.13)	38.6 (0.15)	456.4 (0.23)	483.5 (0.21)
NDR [3]	239.5 (0.40)	198.3 (0.30)	200.0 (0.46)	158.5 (0.33)	65.6 (0.26)	47.8 (0.19)	658.1 (0.33)	592.7 (0.26)
RSG [4]	201.0 (0.33)	314.7 (0.46)	92.8 (0.21)	182.3 (0.38)	154.4 (0.61)	169.3 (0.66)	857.0 (0.43)	1218.7 (0.53)

Notes: Expenditure and revenue figures are totals for the respective group of local authorities. The figures in parentheses give the ratio of each category of revenue to total expenditures.

[1] Total local expenditures, financed by local taxes, non-domestic rates and the revenue support grant.

[2] Revenue from local taxes, the Community Charge (CC) in 1991/92 and the Council Tax (CT) in 1993/94.

[3] Revenue from non-domestic rates (NDR), paid by local businesses but distributed to authorities by central government.

[4] Revenue from the Revenue Support Grant (RSG) received from central government.

Source: CIPFA (1991-94); Municipal Yearbook (1991-1995).

For voter-taxpayers, the only local tax is the Community Charge (CC) in 1991/92 and the Council Tax (CT) in 1993/94. The former is a flat rate tax on all adults with a few exemptions and reductions, and the latter is a tax on households (also with some reductions). The 1991/92 mean tax share (for CC) is computed by dividing the average (per person) CC by total CC revenues:

$$T_{i,\,CC} = (TCC_i/NLTP_i) \,/\, TCC_i = 1/\, NLTP_i$$

where TCC_i is total CC revenues, and $NLTP_i$ is the number of local taxpayers in authority i. This formula is also used for the median voter-taxpayer as it seems reasonable to assume similar mean and median tax shares for a tax levied at a common per-adult rate.[4]

The computation of the mean and the median tax shares in the case of the Council Tax is not so straightforward. The CT is levied on households rather than individuals and the level paid by a household depends on the CT 'band' to which their property is allocated (based on estimated market value ranges). The CT bill for the household therefore has to be modified to obtain the individual tax shares that must take into account the composition of households. Assuming that the CT bill is equally shared by each adult within a household, the 1993/94 mean tax share (for CT) is computed by dividing the average (per person) CT by total CT revenues (that is, similar to the CC case).

A similar complication exists for the median individual CT share. The median individual in terms of CT payments may not be the same as the individual who lives in a household with a median CT band. Examination of the distribution of households by the number of adults per household (from the 1991 Census) shows that the median household (about half of households in most authorities) comprises two adults. We therefore assume that the individual with median tax share lives in a household with two adults. Therefore, the median individual tax share is computed by dividing the

[4] There were reductions in CC for those on social welfare and certain groups, such as full-time students, but data are not available to incorporate this. Any effect should be minor.

average CT bill per household by two, and then dividing by total CT revenue in each county:

$$T_{i,\,CT} = ((TCT_i/NLH_i)/2)/TCT_i = (1/NLH_i)/2$$

where TCT_i is total CT revenues, and NLH_i is the number of local households. This is statistically equivalent to the ratio of the average CT per household to total CT revenue.[5]

As noted earlier, the variable C in equation (5) measures the unit cost of local public goods relative to the prices of private sector goods. While the latter probably do not vary substantially across localities in Britain, differences in local public sector wage rates could create substantial differences in local public sector marginal costs. Data on local public sector wages specifically are not available, but employment income (for public and private sectors combined) by local authority are available. We use these data to proxy local differences in public sector marginal costs.

To compute a C index for our purposes, the employment income in each county is divided by the average for all counties. If the employment income is around the average of all counties, the index is close to unity, and there is a negligible effect on the tax-price. However, if the employment income in a county is significantly below (above) the average, the index will be significantly lower (higher) than unity, and the tax-price will similarly be lower (higher). The tax-price measure which we use is therefore a function of the individuals' tax share, the unit cost of local government-provided goods, and population, such that:

$$P_{gi} = [(R_i/R]\, C\, N^{h}$$

where R_i is individual i's local tax bill, and R is total receipts from local tax.

[5] Despite these differences, the computed mean and median tax shares are highly correlated (around 0.97). A similar pattern also emerges when council tax per household is used instead of per adult. Using any of these proxies produced similar regression outcomes below.

The two major components of central grants are Revenue Support Grants (RSG) and non-domestic rates (NDR). The former is a proportion of the standard spending assessment (SSA) determined by the Consultative Committee on Local Government Finance in annual meetings. The latter, also known as the 'uniform business rate', is collected from local business, placed in a national NDR pool, and distributed in a similar way to the RSG. Both forms of grants can be treated as lump-sum unconditional grants.[6] Therefore, FLY_i is computed as follows (for authority i):

$$FLY_i = (RSG_i + NDR_i)/N_i$$

The data from the 1991 census are used to compute the proxy for renter illusion (REN_i). Around 30% of local population, on average, live in rented houses, with the percentage substantially higher in metropolitan counties (around 39%). The following formula is used to compute the proxy for local accountability (ACN_i):

$$ACN_i = (NOA_i - NLTP_i)/NLTP_i$$

where NOA_i is the number of adults, and $NLTP_i$ is the number of local taxpayers. The ratio is only around 0.03 on average in 1991/93 as there are only few exemptions under the community charge.[7] For 1993/94, the proxy was calculated as:

$$ACNH_i = (NOA_i - NLH_i)/NLH_i$$

where NLH_i is the number of local households. The intuition behind this proxy is to test the argument that CT is paid by the head of the household and only one of the adults is responsible for it, so remaining adults in the household may not be aware of the local tax.

[6] Many of the specific grants have been replaced by lump-sum grants in the UK, except some payments such as mandatory student awards, rent allowance, and some other services such as in-service teacher training, education support, urban development, mental illness, alcohol and drug abuse etc. These are mainly non-discretionary and subject to separate arrangements.

[7] These are resident hospital patients, those being looked after in residential care, the severely mentally handicapped, members of religious communities, people staying in some night shelters or short-stay hostels, those with no homes etc.

Finally, we include a number of other variables in our regressions to allow for some 'taste' effects. One is the population aged 5-15 years (*P515*), which may be associated with higher levels of some forms of expenditure such as housing and education. A dummy variable (D_{labour}) is used to capture the impact of party politics, where $D_{labour} = 1$ if the Labour Party holds the majority of the seats in the county, and $D_{labour} = 0$ otherwise. The Labour Party is often argued to spend more on public services, *ceteris paribus*, so D_{labour} is expected to have a positive sign. Furthermore, dummies for counties in Wales (D_{wales}) and for the metropolitan counties in England ($D_{metropolitan}$) are included in some regressions to allow for respectively regional and urbanisation effects on expenditures. These are expected to be positive in metropolitan authorities and negative in Welsh authorities (that are predominantly rural). Welsh authorities also benefit from (central government) spending by the Welsh Office that potentially allows reductions in Welsh local authority spending.

4 EMPIRICAL RESULTS

In this section we estimate the model outlined in Section 2. We begin by estimating equation (5) by OLS for the median voter (i.e. using median income) separately for the 1991/92 and 1993/94 tax regimes. Results are shown in Tables 3 and 4, and these suggest that the model overall performs well. The coefficients obtained generally have the expected signs, and F-ratios and adjusted R^2s are high. Results are reported for non-metropolitan authorities in England, all authorities (including metropolitan) in England, and all authorities in England and Wales. In the last two cases shift dummy variables are included to allow for the possible differences between Welsh (D_{Wales}) and metropolitan ($D_{metropolitan}$) authorities compared to English non-metropolitan authorities. Results for these dummies confirm that, *ceteris paribus*, Welsh authorities have lower local expenditure levels in both fiscal years, while the dummy for metropolitan counties is significant only in 1993/94.[8]

Looking first at the results for median income, regression coefficients are all positive and significant as expected, suggesting that local government-provided goods are

[8] Wales and Metropolitan counties actually have higher expenditures than average, but this is accounted for by higher central grant revenues per capita (see Appendix Tables 1 and 2). The significant dummy for Wales suggests that spending is relatively low once we control of incomes, grants and other factors. A dummy for Greater London was also tested and found to be positive and significant (at 10% level) in 1993/94, but insignificant in 1991/92.

	England (non-metropolitan)	**England** (non-metropolitan)	**England** (all)	**England &Wales**
Constant	1.58**	1.38**	1.0**	1.20**
	(0.61)	(0.59)	(0.45)	(0.39)
lnY_{median}	0.16**	0.16**	0.15**	0.11**
	(0.06)	(0.06)	(0.06)	(0.05)
lnT_i	0.026**			
	(0.0125)			
lnN		-0.027**	-0.024*	-0.021
		(0.0127)	(0.013)	(0.013)
ln(FLY)	0.67***	0.67***	0.73***	0.74***
	(0.06)	(0.06)	(0.04)	(0.04)
ln(ACN)	0.01*	0.011**	0.008	0.002
	(0.005)	(0.005)	(0.005)	(0.004)
ln(REN)	-0.022	-0.023	-0.035	-0.01
	(0.04)	(0.04)	(0.04)	(0.04)
ln(P515)	-0.12	-0.12	-0.09	-0.06
	(0.08)	(0.08)	(0.07)	(0.07)
D_{Labour}	0.06***	0.06***	0.05***	0.04***
	(0.014)	(0.014)	(0.014)	(0.012)
$D_{Metropolitan}$			-0.008	-0.013
			(0.03)	(0.03)
D_{Wales}				-0.15***
				(0.02)
F-ratio	35.9	36.2	86.6	108.3
χ^2 (Het)	1.52	1.54	4.12	7.88
R^2 (adjusted)	0.87	0.87	0.94	0.95

Notes: Figures in parentheses are standard errors, *** denotes significance at the 1% level, ** significance at the 5% level and * significance at the 10% level. The F-ratio is a joint significance test for the set of variables included in the regressions, and it is highly significant in all cases. The χ^2 (Het) is the Breusch-Pagan test for heteroscedasticity: all the regressions pass this test.

normal goods. The income elasticity of demand for local government-provided goods is an issue which is frequently discussed and all regression estimates suggest that this is substantially lower than unity, and significantly so as confirmed by Wald test statistics in Table 5.

	England (non-metropolitan)	England (non-metropolitan)	England (All)	England & Wales
Constant	1.52*** (0.43)	1.34*** (0.44)	1.07** (0.45)	0.97** (0.45)
$\ln Y_{median}$	0.16** (0.04)	0.17*** (0.04)	0.18*** (0.04)	0.17*** (0.04)
$\ln T_i$	0.023*** (0.008)			
lnN		-0.025*** (0.008)	-0.021*** (0.007)	-0.021*** (0.007)
ln(FLY)	0.67*** (0.05)	0.66*** (0.06)	0.71*** (0.04)	0.74*** (0.04)
ln(ACN)	0.0064* (0.0035)	0.007** (0.003)	0.006 (0.004)	0.0007 (0.004)
ln(SEN)	-0.08*** (0.03)	-0.08*** (0.03)	-0.08*** (0.03)	-0.07** (0.03)
ln(P515)	-0.16* (0.085)	-0.15* (0.08)	-0.20*** (0.06)	-0.20*** (0.06)
D_{Labour}	0.025** (0.012)	0.025** (0.011)	0.022* (0.011)	0.013 (0.01)
$D_{Metropolitan}$			0.05** (0.02)	0.04* (0.02)
D_{Wales}				-0.10*** (0.02)
F-ratio	36.4	37.5	175.2	165.4
χ^2 (Het)	8.58	8.70	7.94	7.33
R^2 (adjusted)	0.87	0.87	0.97	0.97

Notes: Figures in parentheses are standard errors, *** denotes significance at the 1% level, ** significance at the 5% level and * significance at the 10% level. The F-ratio is a joint significance test for the set of variables included in the regressions, and it is highly significant in all cases. The χ^2 (Het) is the Breusch-Pagan test for heteroscedasticity: all the regressions pass this test.

Null Hypothesis	England (non-metropolitan)	England (all)	England & Wales
1991/92			
$\alpha=1$ (income elasticity)	110.7 (0.000)	135.9 (0.000)	203.9 (0.000)
$\eta=1$ (degree of publicness)	5.25 (0.022)	3.88 (0.049)	3.26 (0.070)
$\alpha=\delta_1$ (Equivalence Theorem)	35.01 (0.000)	41.39 (0.000)	64.24 (0.000)
1993/94			
$\alpha=1$ (income elasticity)	239.6 (0.000)	281.6 (0.000)	316.4 (0.000)
$\eta=1$ (degree of publicness)	6.16 (0.013)	5.20 (0.023)	5.57 (0.018)
$\alpha=\delta_1$ (Equivalence Theorem)	55.15 (0.000)	70.14 (0.000)	64.24 (0.000)

Notes: The figures in the cells are χ^2-statistics for the Wald test, and the figures in parantheses are the associated probabilities. The critical values are 3.84 at 5%, and 2.71 at 10%. η is the degree of publicness, α and δ_1 are the coefficients for income and lump-sum grants respectively. The null hypotheses are rejected in all cases.

Regarding the tax-price elasticity, the nature of the computations of tax shares and unit cost does not allow us to draw clear-cut conclusions. Alternative tax-price specifications include measures of tax shares that are highly (negatively) correlated with population, while the measure of unit cost (C) is highly (positively) correlated with income (over 0.9 in all cases). The regressions suffer from multi-collinearity problems when these variables (*lnN*, lnT_i, and lnT_iC) are all included together. To accommodate this, we drop *C*, and test each of the other variables separately, as seen in the first and second columns of Tables 3 and 4. Regressions with *lnN* perform marginally better and the coefficient is of the predicted sign, unlike for lnT_i, hence that regressor alone is used in the final two columns.[9]

It appears that dummies for Wales and, to a lesser extent, metropolitan counties account for any independent population effect (the significance of *lnN*) under the Community Charge but not under the Council Tax. We know from Table 2 that local taxes under CT were a slightly greater source of revenue for (low population density) Wales than under CT, whereas the reverse was true for (high population density) metropolitan counties. A plausible interpretation is that the link between population and local tax revenue, hence to expenditure per capita, was stronger under the CC regime. The switch to the CT reduced metropolitan counties' tax raising ability relative to their population, hence per capita expenditure is consistently lower for high population authorities. Under the CC, this effect was mitigated by the higher tax revenue, relative to population, of metropolitan counties (including $D_{metropolitan}$ reduced the significance of population).

Further tests (Table 5) show that the null hypothesis of $\theta=1$ (that local government services are purely private) is rejected in all cases,[10] but the degree of publicness (θ) is around 0.97 in English non-metropolitan counties, and slightly higher in metropolitan and Welsh counties. These results lead us to accept the hypothesis that the degree of publicness is uniform across all authorities and, though we confirm statistically that θ

[9] Despite the fact that *C* appears in the theoretical model, and it is often measured by wage rates, it is the tax-price component for which we have least confidence in the accuracy of our proxy.

[10] The coefficient for population will simply be $(\eta-1)$ by the exclusion of T_i and *C*. Therefore, an empirical findings of "$\eta-1=-0.02$", for instance, implies that $\eta=0.98$.

is less than unity, there appear to be only small sharing economies (at most) associated with local authority expenditures.

Fiscal Illusion

As mentioned earlier, both revenue support grants (RSG) and non-domestic rates (NDR) can be used to test for the flypaper effect. When the RSG only was used to test for this effect, positive and significant results were obtained. When the NDR is treated similarly to the RSG and the sum of the two included in the estimation, results continue to be positive and significant (with higher F-ratios and R^2s), suggesting that both NDR and RSG have similar influences on voter-taxpayers' perceptions. The argument that lump-sum grants are equivalent to income and likely to have a similar effect on voter-taxpayers' demand for local spending may be tested. When the restriction $\alpha = \delta_1$ (the coefficients on *lnY* and *ln(FLY)* respectively) was imposed on the estimated equations, it can be seen in Table 5 that the computed statistics are substantially higher than critical χ^2 values, suggesting that the null hypothesis of equality is rejected. It would seem therefore that the impact of lump-sum grants on expenditure is not equivalent to the impact when the median voter's income is similarly increased. Moreover, the coefficients for Y_i and FLY_i show that a one percent increase in lump-sum grants stimulates almost a four times greater increase in local public spending than does an increase in the median voter's personal income by the same amount. This is convincing evidence for the flypaper effect, and there is no evidence that the effect was any less under the Community Charge.

Local accountability is captured by *ACN*, the proportion of non-taxpaying voters to taxpayers. The coefficient is positive in all cases, as expected, but significant only for non-metropolitan counties in England. The positive and significant results suggest that non-taxpaying voters support higher demand for local spending, or voters who face the direct local tax burden demand less local spending, providing some support for (the argument to introduce) accountability. There is no obvious reason why this effect should appear to be limited to non-metropolitan counties. The proportion of non-taxpayers tends to be higher in metropolitan counties, as is per capita expenditure under CT, which may explain why *ACN* becomes insignificant for all England when $D_{metropolitan}$ is also included. There is no evidence that the CC regime exhibited greater

accountabilty (i.e. that the coefficient was lower or less significant) than the CT regime.[11]

We also test for renter illusion through inclusion of the variable *REN*, the ratio of renters to total households; this includes Council tenants and is about 30 per cent on average, but almost 40 per cent in Metropolitan counties, and similar in both years (Appendix Tables 1 and 2). This appears with a negative sign in all cases but is only significant in 1993/94. There is no evidence that renters are subject to any fiscal illusion. As the Community Charge is the same irrespective of renting, it is not surprising that the variable is insignificant. The significant negative coefficient under Council Tax could be interpreted as suggesting that renters, who are liable (as CT is based on occupancy not ownership),[12] are more strongly opposed to local spending than are homeowners (perhaps because they can reap the benefits of local spending less readily than homeowners). This would be reinforced if tenants are less permanent residents in a locality than homeowners. The fact that such an effect is not apparent under the CC may be because, by severing the link between local tax and property ownership, the CC reduced the perceived injustice to one group (renters) relative to other taxpayers. There is no obvious reason, it should be noted, why per capita expenditure would be lower, in general, in authorities with a higher proportion of rented accommodation, nor is there any apparent link between this and metropolitan counties.[13]

Other 'Taste' Variables

We included a number of other taste variables that may account for differences across local authorities in the demand for local expenditures. We noted earlier that more children could give rise to demands for higher expenditures on such things as education and housing. Testing the ratio of population aged 5-15 to total population

[11] In the *ACN* measure for Council Tax, all adults in a taxpaying household are assumed to be taxpayers. We also tried a measure using the proportion of households not paying CT but this was insignificant. We are therefore inclined to concur with Cullis *et al* (1991, 1993b) that, though only a proportion of the electorate are *legally* liable for local property taxes, other household members are not necessarily unconcerned about local taxes and spending.

[12] Some tenants, such as full-time students, are not liable to CT, but such categories were not liable to CC either so would not explain the differential results.

[13] Council houses, whether owned or let to tenants, will tend to be in lower CT bands. Hence, relative to the CC, authorities with a high proportion of Council tenants may have lost revenue. Any such effect is lessened if tenants are on social welfare, as they would then have paid reduced CC and CT.

(*P515*) in our regressions did not suggest any positive influence on local government expenditures in either year. In fact the coefficient on *P515* is negative and significant for 1993/94 which may reflect the tendency for expenditure cutbacks in that year to fall most heavily on authorities with large education budgets.[14]

The other taste variable is a binary dummy that takes the value 1 for Labour dominated county councils and 0 otherwise. It is often argued that the Labour Party has a tendency to tax and spend more than the Conservative Party, and the positive and significant signs in most cases support this: *ceteris paribus*, the level of local spending in Labour dominated counties is higher than those in other authorities. The positive effect is weaker when the Welsh counties are included. This may be because many Councils in Wales are dominated by independent councillors, so reducing the positive effect when those counties are included.[15] This should not be interpreted as suggesting that Labour councillors are profligate, as political opponents may claim. It is generally the case that support for Labour is greater in authorities with higher spending needs, where for example the proportion of the population unemployed or in council housing is greater, and there is evidence that councils with large Labour majorities actually set lower local taxes (see Ashworth and Gemmell, 1996).

Mean Versus Median Income

Finally, we use our data on *mean* income differences across local authorities to see whether the power of the decisive voter on the local government budget process is particularly associated with the *median-income*, rather than *mean-income*, individual. Table 6 reports similar regressions to those given in Tables 3 and 4 in order to compare the performance of mean and median income as representing the decisive voter. It is immediately obvious that the 'mean-voter' model behaves very similarly to the 'median-voter' model in the two years. This approach can only capture the 'average' effect of personal income (either mean or median) levels on expenditures.

[14] The average ratio of education expenditures to total local expenditures is 46.7% in 1991/92 and 42.6% in 1993/94. Clearly the expenditure cuts fell especially heavily on education.

[15] The slightly lower significance level when metropolitan counties are included in the sample in 1993/94 may be a consequence of the separate inclusion of the dummy for metropolitan counties ($D_{metropolitan}$). The majority of the seats in those county councils are held by Labour, and some of the effect is captured by $D_{metropolitan}$. However, when the two dummies (D_{labour} and $D_{metropolitan}$) are included separately, consistent results were obtained.

	(0.05)		(0.05)	(0.04)		(0.04)
R^2 (adjusted)	0.95	0.95	0.95	0.97	0.97	0.97
All counties		**1991/92**			**1993/94**	
		(0.04)			(0.03)	
$\ln(Y_{mean}/Y_{median})$		0.01			0.23***	
		(0.10)			(0.08)	
lnN	-0.021	-0.021	-0.021	-0.021***	-0.023***	-0.022***
	(0.013)	(0.013)	(0.013)	(0.007)	(0.007)	(0.007)
ln(PEB)	0.74***	0.74***	0.74***	0.74***	0.76***	0.76***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)
ln(ACN)	0.002	0.003	0.002	0.0007	-0.001	-0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)
ln(REN)	-0.01	-0.001	-0.01	-0.07**	-0.06**	-0.06**
	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)
ln(P515)	-0.06	-0.04	-0.06	-0.20***	-0.20***	-0.19***
	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)
D_{Labour}	0.04***	0.04***	0.04***	0.013	0.017*	0.017*
	(0.012)	(0.012)	(0.012)	(0.01)	(0.009)	(0.009)
$D_{Metropolitan}$	-0.013	-0.017	-0.013	0.04**	0.04**	0.04**
	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
D_{Wales}	-0.15***	-0.15***	-0.15***	-0.10***	-0.10***	-0.10***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Constant	1.20**	1.36***	1.20**	0.97**	0.71*	0.75*
	(0.39)	(0.35)	(0.39)	(0.45)	(0.39)	(0.40)
F-ratio	108.3	106.9	95.3	165.4	187.2	165.7

Notes: Figures in parentheses are standard errors, *** denotes significance at the 1% level, ** significance at the 5% level and * significance at the 10% level. The F-ratio is a joint significance test for the set of variables included in the regressions, and is highly significant in all cases. The χ^2 (1) is the Breusch-Pagan test for heteroscedasticity: all the regressions pass this test.

The results imply that both mean and medium voter models are equally valid, if not actually equivalent.

We also included the ratio of mean to median income as a proxy for the 'distribution effect'. The skewness of income distribution ensures that this ratio is greater than unity and the higher the ratio the more unequal the aggregate income distribution. A positive sign is obtained, though significant only in 1993/94. This result suggests that, under CT, authorities with more unequally distributed income tend to have higher levels of per capita expenditure, an effect not observed under CC. A possible explanation is that this income ratio is correlated with incomes, so richer authorities have higher ratios. As the CC was flat-rate whereas CT had an element of progressivity, richer authorities gained more local tax revenue under CT than under CC, and therefore could spend more. However, we might expect that such an effect would be captured by the income variable itself (and indeed the income elasticity of expenditure is greater under CT than under CC).

An alternative explanation is that the 'distribution ratio' is picking up an altruism effect, along the lines of that suggested by Hudson and Jones (1994). Wealthier taxpayers are willing to pay higher local taxes, even to benefit those who are poorer rather than themselves. The coefficient on median income picks up a willingness of those on higher incomes to demand (and pay for) higher local expenditure. The distribution ratio may pick up an additional altruism effect as, given median income, higher expenditures are associated with more unequally distributed income.[16] It should be noted that our distribution ratio is a crude proxy, and further analysis is required for inter-personal comparisons to test whether the degree of income distribution has any impact on the demand for local public spending. However, the evidence that the distribution effect is not observed under the CC is consistent with the argument that the CC, by preventing richer taxpayers from paying higher local taxes (relative to the average tax bill rather than relative to their income), constrained taxpayers in exercising altruism (or at least perceived equity). It has been convincingly argued that the principal objection to the CC, and the reason it was replaced, was its regressive inequity (Cullis *et al*, 1993a).

5 CONCLUSIONS

This paper has examined a public choice model of demand for local government-provided goods incorporating a number of representations of fiscal illusion, and applied this to local government expenditures in Britain. Data for two fiscal years, 1991/92 and 1993/94, have been used, reflecting two very different local tax regimes - a poll tax (Community Charge) in 1991/92 and a property tax (Council Tax) in 1993/94. An important distinction between the two is that the former was levied on individuals at a flat rate payable by almost all adults, while the latter was levied on households using different tax rates related to the value of their property. Another important and related distinction is that the former was intended to promote local accountability, and consequently (if effective in this way) should have been less

[16] This interpretation assumes that our model represents the expression of public choice, i.e. that expenditures are higher if voters are willing for them to higher, and our variables pick up such willingness. One might counter that we are picking up the tax-setting behaviour of local councils; politicians set higher taxes and spend more if they have more residents on higher incomes. However, the logic of public choice is that voters must tolerate such tax-setting behaviour, which brings us back to our interpretation. Ashworth and Heyndels (1997) present evidence that local politicians' opinions on tax rates are influenced by public choice and 'political cost' variables.

subject to fiscal illusion than the latter. We find that, in fact, fiscal illusion was equally present in both cases.

We find that median and mean income are equally valid representations of the decisive voter; the results are the same whichever measure is used (Table 6 provides a convenient summary of results). The principal evidence for fiscal illusion is the demonstrable flypaper effect under both tax regimes. We find a positive impact of median (or mean) income on the demand for local government expenditures, but with an elasticity considerably lower than unity. The elasticity of per capita expenditures to grants (capturing the flypaper effect) is positive, significant and up to four times greater than income elasticity. This is true under both tax regimes. There is no consistent evidence of renter illusion, nor is there any consistent support for accountability (that expenditures are lower the greater the proportion of local voters who are also local taxpayers). The price elasticity of demand for local public services could not be addressed explicitly. The results also suggest that local government goods and services are essentially private in nature.

Our analysis provides valuable tests of public choice theories. The evidence for the flypaper effect is convincing: a unit increase in grant is associated with a far larger increase in per capita local expenditure (about 0.75 of a unit) than is a comparable unit increase in average income (less than 0.2 of a unit). There is no evidence for renter illusion: there was no tendency for a higher proportion of local households in rented accommodation to be associated with higher local expenditure. However, perhaps the more interesting results were those relating to local accountability and equity, derived from comparing results under the two tax regimes.

Under the Community Charge, almost all adults in a local authority paid the same amount in local tax. As everybody paid the same, there were no non-taxpaying local voters to vote for higher expenditure in the belief that others would foot the bill. Indeed, under the Community Charge, we observed no relationship between the proportion of non-taxpaying voters and the level of expenditure in an authority, suggesting that there was local accountability. However, nor was any such relationship found under the Council Tax, where individual tax bills within an authority differed and where in principle the proportion on non-taxpaying voters was

higher. The implication is that both taxes achieved the same degree of accountability, and that a flat rate tax is not necessary for accountability. If a property tax is levied on the head of the household, it appears that other members of the household are as aware of the tax burden as under a poll tax. We did find evidence that expenditure under the Council Tax is lower the greater the proportion of rented households. This was not the case under the Community Charge, and there is no particular reason why expenditure should be lower if there are relatively more households in rented accommodation (controlling for other factors). Tentatively, we suggest that renters may be more strongly opposed to local spending, from which they derive less benefit than homeowners, if the local tax is seen as linked to property (that they do not own). If this is the case, it has no bearing on the relative accountability under each regime: such opposition did not exist under the Community Charge and appears to have been reflected in lower spending under the Council Tax.

The Community Charge was introduced to promote accountability; our results suggest this was not necessary. The Community Charge was replaced because it was perceived as inequitable, and generated considerable voter hostility to the central government that introduced it. We find that a proxy for income distribution, the ratio of mean to median income, has a positive and significant effect under the Council Tax (expenditure is higher in authorities where aggregate income distribution is less equal), but no significant effect under the Community Charge. We also find that the income elasticity of local expenditure is higher, by almost twice as much, under the Council Tax compared to the Community Charge. We interpret this as evidence that taxpayers on higher incomes are willing to pay higher taxes, even if the higher expenditures benefit those on lower incomes. The Community Charge stifled this desire for equity. As the Council Tax appears as accountable and more equitable than the Community Charge, we conclude that it is, on public choice grounds, a better local tax.

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