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1. Introduction

The growth of government has become a global phenomenon which, over the years, has attracted a great deal of attention and continues to do so[1]. This growth has not been uniform, neither in time nor in space, and it was the factors underlying these differences interest has focused on. No comprehensive theory, however, has yet emerged from the prolific and varied literature. Instead, a number of approaches was developed, each of them an "incomplete explanation of a complex phenomenon"[2].

A problem common to all of them when it comes to testing hypotheses empirically, is the measurement of total public sector economic activity. For lack of data, it is usually approximated by public expenditures. Most probably, this understates the role of government in economic life, since many of its activities, while unrecorded in the budget, redirect resources just as taxation and public spending do. Typical examples are consumer and worker safety regulation, public utility price and output regulation in certain industries, and tax expenditures[3].

With the expenditures of local government, this is much less of a problem. They are predominantly providers of goods and services and their expenditures can be expected to reflect total economic activity, and hence their influence on resource allocation, fairly well. At the same time, the share

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[1] See for example the proceedings of the "Nobel symposium on the Growth of Government: Stockholm 1984", reported in: Journal of Public Economics, Volume 28, 1985, No. 3.

[2] PREMCHAND (1983), p. 40.

[3] For a recent treatment of identification and measurement problems of government activity see HERBER (1984), p. 141.

of local government in total public expenditures is considerable. For many of the Western democracies, it has increased absolutely and relatively over the years, such that in many of them local government is now a major provider of goods and services.

The determinants of local government expenditures have been studied in great detail for the US, the UK and also Switzerland[1]. In the Federal Republic of Germany, by contrast, determinants of local government expenditure have received only scant attention and empirical research until today has remained largely anecdotal. This seems surprising, given the prominent role of local government in a federal system and in the matters concerning its design. These include assignment of functions and taxes as well as criteria for grant distribution, for which identification of expenditure determinants is a necessary prerequisite.

The results of a recent empirical study[2], the most important of which will be presented in Section 3 of this paper, are suited to at least partly fill this void. The results strongly corroborate the validity of the underlying expenditure decision model and of the estimating equation used here. In Section 2, the approach chosen for the empirical study will be contrasted with other approaches to the determination of public expenditures so as to put it into perspective. In Section 4, conclusions and suggestions for further research are presented.

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[1] For surveys see CUTHBERTSON (1981), HAUSER (1975), and INMAN (1979).

[2] Most of the results presented here are from a research project on the determinants of expenditure of local, state and federal government. It was financed by a grant from "Stiftung Volkswagenwerk" and will be published in 1987.

2. Theoretical Approaches to the Explanation of Public Sector Size

A variety of approaches has been offered to explain differences in expenditures, both over time and between administrative units, such as constituent states or municipalities. No attempt will be made here to review them, since this was done elsewhere before[1]. Instead, the approach on which the empirical study was based, will be contrasted with the principal alternatives.

Since the expenditures of local government are at issue, it seems plausible to start from the following assumptions: The role of the "state", i. e. in this case of local government, is that of a provider of goods and services and it is the citizenry which determines their scope and composition. MUELLER has labelled this the "citizen over state" conceptualisation of the state where it is assumed that the state exists to carry out the will of the people. Within the alternative "state over citizen" view, the preferences of the state, i. e. the individuals within the government and the administration, are decisive[2]. The main approaches based on the second one are theories of bureaucracy, the PEACOCK-WISEMAN displacement-concentration effect, BAUMOL's notion of unbalanced growth of the public and the private sector and, finally, the fiscal illusion hypothesis.

In the theories of bureaucracy, originally developed by NISKANEN (1971) and BRETON (1974), expenditures are assumed to be determined by the civil servants' desire to maximise the budgets at their disposal. Checks and balances come into the picture only via the legislature and via competition among jurisdictions. Recent studies are from ROMER and ROSENTHAL

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[1] Examples are MUELLER (1986), BAHL et al. (1980) and INMAN (1979).

[2] The fundamental distinction between the two views can be traced back to De Viti' de Marco's, and Mazzola's concepts of the individualistic and the paternalistic state, PREMCHAND (1983), p. 41.

(1978, 1979, 1980), and MCGUIRE (1981). NOLL and FIORINI (1978) have studied the relationship between bureaucrats, legislators and voters, and especially the situation in which increasing numbers of civil servants are at the same time voters or part of the legislature. An extensive survey of studies using theories of bureaucracy was provided by THUERMER (1984).

The main drawback of the theories of bureaucracy, it has been argued, is their failure to explain how bureaucrats manage to extract additional funds from the legislature. Politicians do not per se have an interest in increased budgets which is why in theories of bureaucracy one ultimately has to rely on specific events that make augmentations of the budget possible. This is where the PEACOCK/WISEMAN displacement-concentration effect comes in as a possible explanation.

They argue that the growth of government expenditures is characterised by jumps rather than a continuous development and that these jumps are associated with major upheavals in society such as wars or economic depressions[1]. Furthermore, it is argued that in such a situation expenditures grow primarily on the central government level. This is an idea that, albeit in a different context, POPITZ has put forward already in the 1920s.

The displacement-concentration effect is not without intuitive appeal and some empirical evidence has been brought forward in its support. But there are also numerous cases in which factual evidence simply flies in the face of expected outcomes[2]. Clearly, the major problem with this approach is that it does not lend itself readily to systematic empirical testing. Since it is mainly concerned with central govern-

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[1] See PEACOCK and WISEMAN (1961).

[2] For a critical evaluation, especially of the concentration effect, see PELTZMAN (1980) and DAVIES (1970).

ment spending it can not be expected to be of much use for the explanation of local government expenditures.

At least prima facie this is not the case with BAUMOL's thesis of unbalanced growth[1]. He argues that the relative expansion of the public sector is due to systematic productivity differentials between the public and the private sector. Allegedly, they result from labour intensive methods of production and the lack of opportunities to introduce technological change in the public sector. The major problem here is to measure the productivity of government services that are not produced by sale. Likewise, it can be doubted whether labour intensive production and lack of technological change are still characteristic for the public sector[2].

One major approach remains to be mentioned. It is based on the notion of fiscal illusion, i. e. the systematic misperception by taxpayers/voters of the ratio of the taxes paid to the benefits (goods and services) received[3]. The fiscal illusion approach parallels the theories of bureaucracy. There it is the legislature which is deceived as to the true costs of supplying different levels of output. Under the fiscal illusion hypothesis, by contrast, it is argued that the bureaucracy deceives the citizens as to the true size of government. It does so by increasing the tax burden in a way that leaves the citizens unaware of it. Tax burdens are thus disguised and citizens have the illusion that government is smaller than it actually is. Then government can grow beyond the levels citizens would prefer.

The empirical literature on fiscal illusion has been reviewed by OATES (1985). The results are mixed which, according to MUELLER (1986), is not surprising given the vagueness

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1 BAUMOL (1967).

2 See PEACOCK (1979), p. 110 - 116, for an application of the BAUMOL-thesis to post-industrial societies.

3 The notion of fiscal illusion dates back to an early 20th century Italian writer, PUVIANI.

of a concept that at best seems suited to explain why fiscal illusion could lead to larger budgets but not why it should[1].

Outstanding examples of empirical studies whose results support the fiscal illusion hypothesis are POMMEREHNE and SCHNEIDER (1978 and 1982). They found that municipalities with an intricate system of local taxation and with a representative local democracy had higher expenditures than those with a simple system and direct democracy. Similar studies were undertaken by ROMER and ROSENTHAL (1978, 1979, 1980). In these studies the fiscal illusion hypothesis was, however, always embedded in an approach based on the notion of the "citizen over state". The fiscal illusion hypothesis was then used as an additional explanation which also served to link the demand side of publicly provided goods with the supply side.

The overwhelming majority of empirical studies undertaken until today are, however, predominantly based on the notion of the "citizen-over-state". Here, two main approaches can be distinguished. Firstly, the public goods approach which is essentially an analysis of the demand for publicly provided goods and services very much along the lines of traditional consumer choice theory. The second approach concentrates on the redistributive function of the state which during the last decades has become an increasingly important part of government activities.

Already back in 1835 de TOCQUEVILLE suggested that demand for redistribution was positively related to the extension of suffrage and the degree of inequality in the distribution of property[2]. Recent empirical research, by using the con-

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[1] See MUELLER (1986), p. 30; for a critique, see also PEACOCK (1979), p. 115, and MUSGRAVE (1981), p. 98 - 104.

[2] de TOCQUEVILLE, Democracy in America, quoted in: Peacock (1979), p. 107.

cept of the median voter and his demand for redistribution, has proceeded along similar lines[1].

These studies have been criticized for assuming that redistribution is the only function of government and that all redistribution is from rich to poor. More generally, the approach fails to explain why - under majority voting - suffrage would be extended in the first place[2].

These difficulties nonwithstanding, the demand for redistribution ought to be taken into account when total public expenditures are at issue. However, as far as local government is concerned it seems justified to neglect this aspect and to concentrate on the citizens' demand for goods and services. This particular approach to the determinants of expenditure has proved a fertile ground for empirical testing. By now, it has generated a large and varied body of literature labelled expenditure determinants studies. Early beginnings date back to the end of the 19th century. WAGNER was the first scholar to recognize a positive correlation between the level of economic development and the size of the public sector[3].

Since then, a variety of empirical studies has sought to test the validity of "WAGNER's Law of the Expanding State Expenditures". These were either time series studies of the growth of expenditures in individual countries or cross section comparisons of expenditure patterns across a number of

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1 Examples are PELTZMAN (1980), MELTZER and RICHARD (1978, 1981, 1983), ARANSON and ORDESHOOK (1981) and BRUNNER (1978).

2 See MUELLER (1986), p. 145.

3 WAGNER (1883 and 1893) quoted in Tarschys (1975), p. 10. TARSCHYS also points out that before this theory of growing government activities became commonly accepted, an opposite hypothesis held sway for several hundred years. This was the belief, dating back to the age of Enlightenment, that the scope of government actions would diminish with the moral and economic evolution of mankind.

countries. A commonly used measure for government growth has been the elasticity of the ratio of government expenditures to GDP with respect to GDP per capita[1]. Not surprisingly, the results for different countries lacked universality and WAGNER's basic presumption was later split into several hypotheses. MUSGRAVE (1970), for example, proposed to differentiate expenditures by category, such as capital formation, consumption and transfer payments. HELLER and TAIT (1983), in a cross section analysis including developed and developing countries, tested WAGNER's Law for government expenditures on personnel. It was confirmed in the majority of cases. More recently ABIZADEH and GRAY (1985) tested WAGNER's Law against pooled time-series, cross section data for 53 countries and found systematic differences between developing and developed countries.

WAGNER had only touched upon the possible influence of population density on expenditures, a factor that BRECHT investigated more closely. He propounded the "law of the progressive influence of massed conglomeration" and found empirical evidence for the expenditures on specific functions such as housing, welfare and internal security[2].

Thus far, only the influence on expenditures of a single factor had been investigated. FABRICANT (1952) was the first to estimate simultaneously the influence of a number of independent variables (per capita income, population density, and urbanization) on the expenditures of state and local governments. He is commonly regarded as the initiator of the determinants approach and, following his lines, a great deal of other studies were undertaken, mainly for the US but also for the UK and Switzerland[3].

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1 For a survey of the empirical literature see BIRD (1970), p. 69-88 and AFXENTION (1980).

2 BRECHT (1932), Internationaler Vergleich der oeffentlichen Ausgaben, quoted in: Tarschys (1975), p. 11; see also KAEHLER (1982) for a comparison of Brecht's with Wagner's Law.

3 For a survey of early determinants literature see, for example, BAHL (1968), HAUSER (1975), and CUTHBERTSON (1981).

It is the merit of these early studies to have provided first approximations of the variables relevant for public expenditures. At the same time they served to carve out the main areas of contention such as the influence of grants, population density, and economies of scale on expenditures. The main drawback of the early studies was their lack of a firm foundation in theory. Since independent variables were chosen more or less ad-hoc not much could be inferred with regard to the structural relations among them. As a result it was frequently impossible to interpret coefficients in a meaningful way and to relate the results of one study to those of others. INMAN concluded that the early determinants studies were "more suggestive of problems to be avoided than of answers to be used"[1].

The first to develop a firm conceptual framework upon which to build and interpret empirical analyses were GRAMLICH (1968), HENDERSON (1968), and BARR and DAVIS (1966). Their studies became the basis for most of the empirical work that followed. The "fundamental innovation"[2] of these studies is to apply traditional consumer choice theory to the public sector. Consequently, it is asserted that fiscal decisions can be viewed as made in a fashion that maximises some utility function subject to a set of constraints. Briefly, a utility function is assumed to represent individual preferences for local service outputs and private net of tax income. The individual budget constraint with local services and financing is then derived under the assumption that total taxes as well as service outputs are shared on a per capita basis. The link with the community budget constraint is provided by a cost function where factor prices of labour and material are exogenous and related to a Cobb-Douglas production function with constant returns to scale. Maximising the utility function which is interpreted as the pro-

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[1] INMAN (1979), p. 274.

[2] INMAN (1979), p. 274.

cess of fiscal choice then yields a set of demand equations which can be tested empirically[1].

There are two important advantages over the early determinants studies. Firstly, a structural model allows for detailed hypotheses to be tested regarding the influence of the underlying structural relations. Secondly, parameters estimated for the independent variables of the reduced-form equations can be interpreted unequivocably.

As regards the specification of the community utility function, i. e. the decision as to whose preferences govern local fiscal choice, there are several possibilities. One of them, which is explicitely related to the demand for publicly provided goods and services, is the median voter model of fiscal choice.

Generally speaking, the median voter theorem is based on the notion that individual voters determine the political decisions within a democracy. Politicians, in making tax and expenditure decisions, reflect the preferences of their constituents. Under certain conditions[2] the voter with median characteristics such as income, housing value, tax bill, and tastes is pivotal for ballot outcomes. In a framework of local fiscal choice[3] he thus determines the demand for publicly provided goods and services. BAHL et al. have pointed out that in this respect the median voter approach parallels the public choice approach to government expenditures[4].

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1 A blueprint of constrained maximization applied to local fiscal choice is in INMAN (1979), p. 275 - 278.

2 For a concise description and critical analysis see INMAN (1978), p. 278 - 283, ROMER and ROSENTHAL (1979), p. 145 - 146, AKIN and LEA (1982), p. 114 - 117.

3 The median voter theorem has been employed in a wide range of economic contexts, including pollution control, income redistribution and minimum wage legislation. See ROMER and ROSENTHAL (1979), p. 144.

4 BAHL et al. (1980), p. 70.

At the same time it can be considered part of the constrained maximization framework outlined above, in that the median voter's utility function becomes the community utility function. Clearly, the great advantage of the median voter approach is that, while applying the principle of consumer sovereignty to political decisions, it allows for the analysis of social problems via the preferences of a single individual.

The median voter approach to local fiscal choice is not without drawbacks[1]. Firstly, the conditions under which it may appropriately be applied are restrictive and rarely are all of them fulfilled[2]. But even if the median voter can be assumed to be representative, additional assumptions have to be made. They regard prices of goods other than publicly provided, the specification of the budget constraint as well as of the production function, and the use of per capita expenditures as a proxy for output[3]. Finally, econometric problems of multicollinearity and simultaneity may arise when the reduced form equations are tested empirically.

The ensuing caveats nonwithstanding, empirical studies using this approach have yielded meaningful and suggestive results that, by and large, have tended to square with economic theory[4]. The median voter specification of the constrained maximization approach to local fiscal choice can therefore be considered an appropriate way to identify the determi-

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1 For a fundamental criticism see GROSSKOPF and HAYES (1983).

2 The most important ones are: Low barriers for running for political office, well informed voters, no abstentions, voting by majority rule and on one-dimension-issues, median voter is the one with median family income. On the median voter model and public expenditures see also ATKINSON and STIGLITZ (1980), p. 322 - 330. On research into the appropriateness of applying the median voter model see BAHL et al. (1980), p. 74.

3 This is discussed in detail by BAHL et al. (1980), p. 76 - 87.

4 See for example the survey of BAHL et al. (1980), p. 89 - 99.

nants of local government expenditures. It is to its application to the expenditures of West German local government that I turn in the next section.

3. The Median Voter Approach Tested for Local Government in the Federal Republic of Germany

Within the overall federal structure of West Germany, local government is a major provider of goods and services and its share of aggregate public expenditure is considerable. Moreover, by international standards, it is comparatively independent. One reason for this is the principle of "communal self-administration" which is recognized in the constitution and is held to imply a high degree of local autonomy. Specifically, this entails the competence for any municipality to provide any services considered to be in the interest of the inhabitants. Even though in practice "communal self-administration" will often be constrained by various statutory provisions, discretion over expenditure decisions remains comparatively high. It would therefore seem that, whatever the determinants of local government expenditure are likely to be, their influence on overall public spending can be expected to be substantial.

It is all the more surprising that empirical research until today has remained sparse and that practically nothing could be said about West German local government as a whole. Only three recent studies exist that employ testable expenditure equations. PROSS (1982) is the only one explicitly deriving his reduced-form equation from the median voter model. But only the 144 smallest municipalities of a single state, Baden-Wuerttemberg, were studied and only 1976/77 aggregate expenditures were analysed. In the two other studies by DEUBEL (1984) and MIELKE (1985) expenditures are differentiated by function but the approaches chosen are merely statistical and in no way related to an underlying model of expenditure decision. Furthermore, they are equally confined to the municipalities of one state, Northrhine-Westphalia.

For the present study, the 500 largest municipalities in West Germany were selected for a cross section analysis. They account for roughly half of the country's population and half the aggregate expenditure of local government. Aggregate expenditures as well as a breakdown by functions[1] were analysed for each of the fiscal years 1980 - 1983. It can thus be considered the first expenditure determinant study fairly representative of West German local government.

The estimating equation used here is of the log-linear type and is based on the one presented by BORCHERDING and DEACON (1972). They were among the first to develop a model of public spending which was derived from the received theory of collective decision making - in this case the median voter theorem - and to test the significance of certain variables assumed by the theory to be relevant for local government spending[2].

Their estimating equation was modified to account for some particular features of German local government. In addition, the influence on expenditures of grant and population change was tested. In log-linear form, such that coefficients can be interpreted as elasticities, the equation is

$$\ln (E/N)_i = b_0 + b_1 \ln N + b_2 \ln (Y/N) + b_3 \ln P_i + b_4 \ln (N/A) + b_5 \ln (G/N)_i + b_6 D1 + b_7 D2 + b_8 D3$$

where
- $(E/N)_i$ = per capita expenditures on function i
- Y/N = per capita income
- P_i = price of goods publicly provided
- N/A = population density (A stands for administrative area)
- $(G/N)_i$ = specific grant per capita
- $D1$ = dummy for "growing/declining population"

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[1] See Table 3 for these functions

[2] BORCHERDING and DEACON, 1972, p. 891-901

D2 = dummy for "direct/representative local democracy"

D3 = dummy for "type of administrative status"

Per capita income for each local authority was derived from income tax statistics data and, in accordance with the propositions of traditional consumer choice theory, they as well as population were expected to be positively related to per capita expenditures.

While it was assumed that for privately provided goods and services price differences are zero, a price variable was derived for the goods and services provided by the municipalities[1]. Using a Cobb-Douglas function and assuming perfect mobility of capital and therefore identical rates of interest among the local authorities, the price of good i in local authority j can be written as

$$P_{ij} = f\left(w_j^{(\beta)_{ij}} \right)$$

where w is the wage rate and ß the partial elasticity of production with respect to labour. Wage rates were approximated by the ratio of payroll to the number of employees.

The partial elasticity of production with respect to labour was approximated by the ratio of payroll to total expenditure. Accordingly, prices were estimated for each of the local authorities under consideration, as well as each function and year. In other words, for each of the local authorities and each of the functions a separate production function was assumed to exist. Price differentials between local authorities could then be interpreted either as the result of differences in the efficiency of the production technique employed or in the average wage rates. Per capita expenditures and prices were expected to be negatively related.

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[1] BORCHERDING and DEACON, 1972, p. 893

Density of population and per capita expenditures were expected to be positively related whenever higher density necessitated additional public provision of goods and services or, rendered provision of already existing ones more costly. The latter is likely to be the case for the expenditure on most functions. A negative influence of population density was expected in cases where the good or service in question displayed the characteristics of a public good or provision could be associated with increasing scale economies.

Per capita grants were expected to be positively related to per capita expenditures. Only specific grants were included into the estimation and, due to the criteria employed for their distribution, they are practically all closed-ended in nature. Their effect on expenditure was therefore expected to be substituting rather than stimulating, with elasticities smaller than one.

Expenditures per capita, especially for the operation of public facilities, were also expected to be influenced by population changes. Decreasing population will in most cases lead to decreasing numbers of users of such facilities. Unless adjusted in size, production will then become inefficient and per capita expenditures are likely to rise. In municipalities with a persistent population decline, per capita expenditures can therefore be expected to lie significantly above those of municipalities with a more or less constant population. On the other hand, in local authorities with a persistent population increase, political and administrative lags may prevent demand for additional goods and services from becoming immediately effective and may therefore lead to significantly lower per capita expenditures. Such deviations were expected for "Education", "Science, Arts and Libraries", "Personal Social Services", "Health and Sports", "Housing" and "Public Enterprises". Persistent population decline or increase was measured as the relative change of population between mid-1978 and mid-1983. It was introduced into the equation as a dummy variable (D1), which takes the value of one in the case of declining population and zero in the case of constant or increasing population.

The details of local administration, representation and government differ considerably from one state to the other and these differences are likely to affect local authorities' expenditure decisions. Elements of direct democracy prevail in the municipalities of Bavaria, Baden-Wuerttemberg and Rhineland-Palatinate, where the local mayor is either elected directly by the population and not by the members of the city council, or can be dismissed prematurely by general referendum. In addition, under certain conditions, other forms of referenda may be held. None of this is possible in the local authorities of the other states where elements of representative democracy prevail[1].

These different degrees of directness of democracy were assumed to be sytematically related to different degrees of fiscal burden and expenditure illusion[2]. In local authorities of the direct democracy type, voters are likely to be better informed about decisions taken by local government and will also to a greater extent influence these decisions. In that case, fiscal illusion and, consequently, expenditures are expected to be significantly lower than in local authorities of the representative democracy type. This was also tested with a dummy-variable (D2), which takes the value of one for representative democracy authorities and of zero for direct democracy authorities.

The expected signs of all independent variables chosen for the estimation are summarized in Table 1. OLS regressions were run for aggregate expenditures as well as expenditures on separate functions, for the years 1980, 1981, 1982 and 1983. Not all calculations are presented here, but only those for capital and operating expenditures lumped together and with the values of the independent variables of the same year as those of the dependent variables. In other words, it was assumed that in municipalities decisions on expenditures are taken with regard to the current situation. Because of

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[1] LANG (1975), p. 154.

[2] See POMMEREHNE and SCHNEIDER (1978), p. 325.

Table 1: Independent Variables: Expected Signs of Coefficients

Independent Variable	
population (N)	(+)
per capita income (Y/N)	(+)*
price of goods publicly provided (P_i)	(-)
population density (N/A)	(+)**
per capita grant (G/N)	(+)
declining population (D1=1)	(+)
representative local democracy (D2=1)	(+)
"kreisfreie Stadt" (D3=1)	(+)

* (-) for expenditures on "Personal Social Services"
** (-) for expenditures on "Refuse Collection and Disposal"

the long-term character of certain expenditure categories, it would have been equally plausible to assume a lag between variations of independent variables' values and expenditure variations. Estimations with a one-year-lag, however, did not add to the model's explanatory power.

Per capita spending was not split into capital and operating expenditures even though spending on either category may be influenced by different factors and lumpiness of capital spending could make any one year's distribution non-representative. In previous studies, capital spending was therefore sometimes excluded from the analysis. This, however, is justified only if the ratio of capital to operating expenditures is the same regardless of the scale of output of municipal services and, for a given amount of output, capital and operating expenditures are non-substitutable[1].

[1] See WILENSKY (1970), p. 206.

For the municipalities considered here, neither of these assumptions seems particularly reasonable. Instead, separate regressions were run for capital and operating expenditures. For both categories, the variations in expenditure were somewhat better explained for the functions "Law and Order", "Education" and "Public Enterprises". For all others, the results were either inferior to those presented in Tables 2 and 3 or remained virtually unchanged.

Results for total expenditures are reported in Table 2. With values of adjusted R^2 of 0.71 to 0.75, the overall fit is good and the F-values are sufficiently high to ensure overall statistical significance for all the years considered. Moreover, the majority of coefficients for the independent variables is significantly different from zero on the 1 percent level (two-tailed t-test), all others on the 5 percent level. With the exception of the variable D2 that accounts for different degrees of direct democracy, the signs of all coefficients conform to a priori expectations. All in all, results for different years differ only marginally. Although capital expenditures were not excluded, lumpiness for any one year does not seem to have affected the results.

Regressions were also run for the expenditures by functions and again, results for different years were very similar so that only those for 1983 are reported (Table 3). With values for adjusted R^2 ranging from 0.54 to 0.68 and for the F-test from 71 to 128, the explanatory power of the estimating equation is high for "General Administration", "Law, Order and Protective Services", "Science, Arts and Libraries", "Personal Social Services" and "Housing". For "Education", "Health", "Refuse Collection" and "Public Enterprises" this is, however, clearly not the case. Equally, considerable differences exist between coefficients with regard to their statistical significance and the values they take. Most of the deviations from expected outcomes, however, can be explained by the characteristics of service provision.

Table 2: Regression Results for Aggregate Expenditure, Per Capita, 1980-1983

Year	constant	N	Y/N	P	N/A	G/N	D1	D2	D3	$\bar{R}_2$
1980	4.0744**	.11228**	.12726**	-.08689**	.04093*	.17103**	.06785**	-.11728**	.18117**	.71
	(10.37)	(6.87)	(2.90)	(-6.15)	(3.08)	(14.25)	(4.41)	(-7.13)	(6.61)	(152)
1981	4.20435**	.11135*	.11693*	-.10407**	.05389**	.16770**	.07131**	-.11347**	.19311**	.72
	(10.39)	(6.64)	(2.59)	(-7.84)	(3.98)	(13.72)	(4.58)	(-6.75)	(6.89)	(157)
1982	4.24203**	.09700**	.12408**	-.08068**	.05986**	.15603**	.06473**	-.11801**	.20355**	.74
	(11.21)	(5.98)	(2.97)	(-6.74)	(4.67)	(12.69)	(4.49)	(-7.29)	(7.63)	(171)
1983	4.09414**	.10511**	.12925**	-.08278**	.05832**	.15995**	.08392**	-.11898**	.19905**	.75
	(11.05)	(6.56)	(3.20)	(-7.31)	(4.69)	(12.26)	(5.97)	(-7.23)	(7.56)	(183)

Notes: N: population
Y/N: per capita income
P: price of goods publicly provided
N/A: population density
G/N: per capita grant

D1: dummy variable 'growing/declining population', D1 = 1: decline
D2: dummy variable 'type of local government constitution', D2 = 1: representative democracy
D3: dummy variable 'administrative status', D3 = 1: 'kreisfreie Stadt'
Figures in parantheses indicate the t- and F-values. An asterisk indicates statistical significance at the 95%, two asterisks at the 99% confidence level. All F-values are statistically significant at the 95% level.

Table 3: Regression Results, Expenditure by Functions, Per Capita, 1983

Function	constant	N	Y/N	P	N/A	G/N	D_1	D_2	D_3	$\bar{R}^2$
General Administration	4.89281** (9.99)	-.02026* (-1.01)	.12044 (2.26)	-.12946** (-17.46)	.04642** (2.88)	.02472** (3.84)	.11126** (6.14)	-.14629** (-7.16)	.12323** (3.55)	.54 (71)
Law, Order and Protective Services	.70378 (.97)	.13133** (4.31)	.14336 (1.80)	-.02112* (-2.16)	.08912** (3.71)	.12390** (10.56)	.03976 (1.46)	.01350 (.45)	.47794** (9.00)	.57 (80)
Education	-8.01868** (-2.80)	.10129 (.84)	1.32635** (4.20)	.00223 (.06)	-.24089* (-2.54)	.22524** (7.51)	-.05533 (-.52)	-.03239 (-.25)	.57968** (2.91)	.19 (15)
Science, Arts and Libraries	-3.89997** (-3.09)	.31982** (5.97)	.34536* (2.48)	.01764 (1.57)	.13301** (3.23)	.25509** (15.41)	.15345** (3.27)	-.48427** (-9.12)	.09009 (1.01)	.68 (128)
Personal Social Services	7.89120** (7.56)	.15778** (3.62)	-.65314** (-5.68)	-.10948** (-8.53)	.26726** (7.77)	.15585** (10.90)	.17929** (4.63)	.34238** (7.88)	.51552** (6.89)	.68 (127)
Health, Sports and Recreation	3.14452** (3.25)	-.00429 (-.11)	.05085 (.48)	-.08121** (-6.08)	.22707** (7.10)	.09456** (7.68)	.08739* (2.44)	-.15211** (-3.66)	19833** (2.88)	.45 (50)
Housing, Town Planning and Roads	2.27871** (4.33)	.16161** (7.31)	.16789** (2.89)	-.08695** (-8.76)	-.04286* (-2.44)	.19479** (14.84)	.06092** (3.03)	-.24121** (-10.68)	.01562 (.41)	.64 (109)
Refuse Collection and Disposal	4.50452** (5.70)	.05812 (1.79)	.03356 (.38)	-.07264** (-5.72)	.02446 (.92)	.07499** (8.66)	.10141** (3.44)	-.21178** (-6.39)	.11762* (2.11)	.28 (25)
Public Enterprises	-1.77453 (-1.04)	.45182** (6.36)	.28325 (1.51)	-.03669 (-1.18)	-.10038 (-1.74)	.09446** (4.68)	-.00740 (-.11)	-.79297** (-10.99)	-.33124** (-2.70)	.31 (29)

For notes see Table 2.

4. Conclusions

The consumer choice model of expenditure decision that was used to explain variations in the spending of the 500 largest local authorities in the Federal Republic of Germany proved to be of considerable explanatory power for four consecutive years. The most robust results were obtained for aggregate expenditures, but also for expenditures broken down by function the approach has yielded results that for the majority of services are plausible and instructive. Apparently, differences with regard to the conditions of production, their characteristics in terms of the theory of public goods and price as well as income elasticities do not in principle alter the validity of the approach.

It seems therefore an appropriate basis for further research into the expenditures of West German local government. This should be directed to the testing of more detailed local fiscal hypotheses. Publicness coefficients, the influence of population density and of scale economies in the production of publicly provided goods should be estimated for expenditures on specific services. Information on what determines the expenditures of local government under the present assignment of functions and revenues is indispensable for the evaluation of attempts to reform local taxation, the distribution of grant and the position of local government in the framework of fiscal federalism.

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