Local government service production: The politics of allocative sluggishness*

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Abstract. A partial adjustment model with endogenous speed of adjustment is developed to analyze how pressure from interest groups and mass media influence the adjustment process of local governments. A survey questionnaire to the local politicians is used to measure the pressure indicators. Based on a combined cross-section and time-series data base for Norwegian local governments, the sluggishness of the adjustment process is estimated. The dynamics of the adjustment process is shown to reflect the activity of interest groups and media pressure. Pressure groups related to primary education explain an important part of the sluggishness observed. Pressure groups promoting kindergartens and health care / care for the elderly stimulate reallocations.

1. Introduction

The resource use of local governments has been focused in the public debate in Norway. The sector has been steadily expanding since World War II. The growth has enabled the local authorities to add new resources to all services, thereby avoiding hard pressure for efficiency and reallocation. The combination of reduced real growth and dramatic shifts in the age composition of the population represent a new challenge. The changing structure of demand for local public services asks for a restructuring of the service production. The authorities has been criticized for a slow response to the "wave of the elderly." The rigidity of the resource allocation is the focus of the study.

An important economic role of local governments is to generate effective-

ness according to the decentralization theorem proposed by Oates (1972). They have an advantage in balancing preferences and costs, and adjusting the service supply to local demand. The reallocation of resources to accommodate a changing demand pattern for local public services is the key responsibility of local authorities. The responses of local governments to changing demand are investigated empirically.

The background of the rigidity observed is clearly complex. One important aspect emphasized is the role of interest groups. The activities of interest groups are associated with the blocking of reallocations. The political scene resembles a battlefield for interest groups. They are of two kinds, partly associated with inside local government employees, professions and trade unions, and partly with outside groups of clients of local public services. The insiders of the local government organization often build "coalitions" with the external clients, like teacher unions and parents. The linkages between rigidity and interest groups are spelled out below.

The approach is based on an extensive literature on local government decision models and interest group influence. The partial adjustment model developed by Borge and Rattsø (1993a) serves as a benchmark. To understand adjustment inertia, a dynamic framework is needed and a separation between the desired and the actual allocation of resources seems fruitful. The desired allocation is determined by a demand system associated with the dominant party or coalition. The speed of adjustment towards the desired service composition describes the reallocation process. The setup allows for the endogenous determination of the speed of adjustment linked to interest group activity.

The paper is organized as follows: Section 2 describes the empirical background. Section 3 presents a model of the local decision making process, and Section 4 the dynamics. The role of interest groups is discussed in Section 5 with hypotheses for the empirical test. Section 6 operationalizes the model, while in Section 7 the adjustment inertia is documented.

2. The empirical background

In Norway, demographic shifts have been dramatic during the last decade. The "wave of the elderly" is combined with a decline in the young cohorts. The share of youth eligible for primary education (7–15 years) has declined from 14.5 to 12.6 percent during the period under study (1984–90), a reduction of more than 10% on average. About 100 of the 442 municipalities experienced a decline in this age group in excess of 20 percent. The share of elderly (more than 67 years) has increased from 14.4 to 15.5 percent. The number of old increased by more than 10 percent in 135 municipalities. The change in the age

Table 1. Budget shares of main services 1984–1990, (N = 442)

Year	Admin. (1)	Education (2)	Health (3)	Kindergt. (4)	Culture (5)	Infrastr. (6)
1984	11.2	46.6	16.2	3.2	5.8	17.0
1985	11.2	45.8	16.9	3.4	5.9	16.7
1986	11.9	43.0	17.9	3.8	6.2	17.2
1987	12.4	42.2	18.0	4.5	6.2	16.7
1988	12.6	41.6	18.3	5.3	6.2	16.1
1989	12.6	41.1	18.2	6.0	6.3	15.8
1990	12.4	40.0	18.8	6.8	6.4	15.7

Source: Local government accounts, Central Bureau of Statistics.

structure of the population in particular has affected the demand for primary education and health care/care for the elderly. Other factors have worked in the same direction, noticeably greater female work-participation and less family based care.

The development of the budget shares of the six service sectors of the local authorities are documented in Table 1. The shift from primary education to health care/care for the elderly corresponds to the demographic shift observed. The main trend implies that central administration, health care/care for the elderly and kindergartens take an increasing share of the budget at the expense of primary education and infrastructure. Since the local authorities on average have had a real growth of total spending of about 3% per year, real spending has increased in all the service sectors. The analysis relates the changing composition of spending to the development of demand and interest group activity.

3. A static model of the local decision making process

The standard model analysis of local government resource use estimates individual demand functions for local public services associated with the median voter. Inman (1979) and Rubinfeld (1987) represent comprehensive surveys. A majority rule voting process is assumed to produce local public service provision consistent with the preferences of the median voter. The model is not well suited for the multi-service Norwegian local governments where political parties are important players. A simple alternative formulation assumes monopoly power of the dominating party or multi-party coalition. The local decision making process is described "as if" a utility function, representing the preferences of the dominant party, is maximized subject to a budget constraint. Inman (1979) evaluates the general experiences with this assumption.

The party oriented model has great intuitive appeal in the Norwegian context, but must take into account that the system does not comprise a cabinet. An executive board elected among the members of the local council is established, with proportional representation of all (major) parties in the local council. The system of joint rule is likely to facilitate consensual properties, particularly in municipalities where no party coalition has a majority. Hence, we assume that a compromise among the parties is worked out when there is no dominating coalition. A majority party on the contrary, is assumed to be able to dictate the decisions in both the local council and the executive board.

The acceptance of the role of the dominant party / coalition opens up for an implicit handling of voter behavior and political decisions. A framework for the modelling of such relationships is proposed by Austen-Smith and Banks (1988). The endogenization of the formation of policies and coalitions is outside the scope of this paper, but a potential for future improvement of the analysis.

In the background of the dominant party / coalition, different groups of voters struggle for influence. The group decision models proposed by Craig and Inman (1985) and Renaud and van Winden (1991) explicitly take this into account. The Norwegian version developed by Borge and Rattsø (1993b) studies the competition between different age groups for local government services. The age composition of the population is included as background demand variables in the present study. They represent the changing demand for local public services. In addition, interest groups are assumed to influence the priorities of local governments and the implementation of policies. As explained in Section 5, they are described by the pressure perceived by politicians of the dominating party / coalition related to special interest groups and media.

The modelling of the local decision making process must capture the centralized system of financing in Norway. The standard demand model of local government behavior concentrates on the choice between private consumption and local public services. However, the Norwegian system implies that local authorities are only allowed to choose between local public services given an exogenous budget constraint. General grants from central government and income tax revenue sharing are the main sources of revenue for the local authorities. The grants are distributed according to a formula taking into account the local income level and local characteristics such as the age composition and the density of the population. The basic principle of the grant system is that the grants are independent of the local spending decision. The exogenous budget constraint implies that the choice between private and local public goods is determined at the central level. What is left for the local public choice process is the allocation of the total budget between different services. A static model for Norwegian local governments along these lines is formulated by Rattsø (1989).

The maximization of the utility function (defined over per capita service

production) of the dominant party/coalition defines the desired spending share in sector i in year t (A_{it}^*) as a function of the prices of each of the n services ($P_{it}, \ldots, P_{nt}$) and total local government spending per capita (Y_t). It should be noticed that no normative conclusions regarding the desired allocation can be derived from the model. The preferences guiding the allocation do not necessarily lead to an optimal demand in a welfare theoretical meaning. The demand functions on a general form are:

$$A_{it}^* = f_i(P_{1t}, \ldots, P_{nt}, Y_t; I_t, Z_t, POL) \tag{1}$$

Except for the conventional price and income variables, three aspects are added. First, the utility function is influenced by interest group variables (**POL**) describing the local political pressure for services.[1] Second, the priorities are assumed to depend on a vector of sociodemographic characteristics (Z_t) that represents variation of the utility function between local authorities. The age composition of the population is the main factor explaining varying demand across authorities and changing demand over time. Third, the equation describes a rationed demand system since the choice between local public services and private consumption is restricted. Per capita private consumption (I_t) is an exogenous variable, and is included to capture possible non-separability with local public services. In general the marginal rate of substitution between two local public services will depend on the level of private consumption.

In the empirical analysis, the general demand function f_i given by equation (1) has to be modified. The study is based on expenditure data, and it has not been possible to separate the expenditures in price and volume components. Hence, price effects have to be left out of the empirical model. The consequences of this necessary shortcut are discussed by Borge and Rattsø (1993a). Borge and Rattsø (1993b) estimate a demand model including relative prices, but assuming constant speed of adjustment, for a sample of local authorities. Their results suggest that adjustment inertia and expenditure elasticities can be estimated without bias in a model leaving out the effect of prices.

The empirical version of the demand function f_i is given by (1'):

$$A_{it}^* = \alpha_{i0} + \alpha_{i1}\log Y_t + \alpha_{i2}\log I_t + \alpha_{i3}Z_t + \alpha_{i4}POL \tag{1'}$$

Per capita private consumption and the variables included in Z_t and **POL** enter the demand functions additively, and are not assumed to influence the expenditure elasticities.

4. A dynamic model of local government priorities

The static models of the demand for local services assume that the policies formulated are executed instantly. No obstacles to budgetary reallocation exist. A serious weakness is the lack of an adequate modelling of the implementation process. Initialized by Pressman and Wildavsky (1973), researchers have increasingly focused on implementation problems. The present study takes implementation problems into account by developing a dynamic model of local government priorities.

In the political science literature, dynamic aspects have been captured by the incremental model. The assumption of bounded rationality is the point of departure. Decision making is not based on a rational, comprehensive and continuous evaluation of all relevant alternatives. Rather, it is characterized by a search for alternatives that deviate marginally from the existing situation. This idea of incremental decision making is well established in budgetary theory by Wildavsky (1964). A number of empirical studies in the late 1960s and 1970s suggested that budgetary processes can be explained as a set of simple, incremental decision making rules (Davies, Dempster and Wildavsky, 1966; Cowart and Brofoss, 1979). Local government budget-makers perceive themselves trapped in the inertia of past commitments, the regulations of central government, and the incremental routines of budget-making. Therefore, the status quo holds a decisive advantage in government budgeting. The early studies of incrementalism suffered from methodological problems. Subsequent reanalysis indicates a considerable degree of structural variability in the budgetary process (Lane, Westlund and Stenlund, 1981). Some evidence suggests that budgetary processes tend to be less stable in times of fiscal austerity. Local governments allow the study of variation between comparable institutions.

Few dynamic studies of local government priorities have appeared in the economic literature. Ehrenberg (1973) is the only model known separating between short and long run responses (to wage shifts) in local governments. He introduces dynamics by letting the subsistence levels in the Stone-Geary utility function depend on the allocation in the previous year. Dunne, Pashardes and Smith (1984) build a ''hangover''-effect into a model of public consumption allocation, assuming that part of the present expenditures pays for old commitments that do not produce utility now. Bennett (1984) and Barnett (1986) assume that only marginal changes are considered in the budget process. None of the above cited studies analyze variation in sluggishness across municipalities.

Our approach attempts at marrying incrementalism with optimization models and to explain the variation of sluggishness between local governments. As opposed to the incremental model, the degree of sluggishness is endo-

genously determined. Compared to Ehrenberg and Dunne et al., we have chosen to concentrate on inertia related to adjustment costs and the supply side. We think it is more productive to look at obstacles for the implementation of the desired allocation.

The problems of implementing the desired allocation are addressed in the dynamic part of the model. In general, the actual expenditure shares may differ from the desired because of costs of adjustment and opposition to reallocations. This idea can be captured by a quadratic cost function, as suggested by Griliches (1967: 43):

$$C_t = \sum_{i=1}^{n} (A_{it} - A_{it}^*)^2 + \mu_t \sum_{i=1}^{n} (A_{it} - A_{it-1})^2 \tag{2}$$

The first term on the right hand side reflects the costs associated with the gap between the desired and the actual priorities. Compared to the utility function of the dominant party/coalition, the gap represents a loss of utility. The interpretation of the second term as real adjustment costs is problematic since they should be built into the budget restriction. We choose to interpret the second term as non-pecuniary costs associated with the implementation of the desired allocation, i.e., political costs related to opposition to reallocations. μ_t reflects the relative importance of these non-pecuniary costs compared to the utility loss.

The actual expenditure shares are determined by balancing the utility loss against the costs of adjustment, i.e., by minimizing C_t with respect to A_{it}. This produces the well known partial adjustment rule given by equation (3) or equivalently by (3'):

$$A_{it} - A_{it-1} = \frac{1}{1 + \mu_t} (A_{it}^* - A_{it-1}) \tag{3}$$

$$A_{it} = \frac{1}{1 + \mu_t} A_{it}^* + \frac{\mu_t}{1 + \mu_t} A_{it-1} \tag{3'}$$

It appears from (3) that the actual adjustment is a fraction of the desired adjustment. The fraction, $\lambda_t = (1 + \mu_t)^{-1}$, shows how much of the desired adjustment that is implemented in the first year, and is decreasing in μ_t. The speed of the reallocation process following shifts in demand is less the higher the costs of adjustment are relative to the utility loss. (3') states that the actual expenditure share is a weighted average of the desired expenditure share and the actual expenditure share the previous year. Since the weights are common for all sectors, the budget restriction will hold, i.e., the actual expenditure shares sum to unity.

The speed of adjustment towards the desired allocation may vary between

local authorities because of interest group activities. The model allows for the testing of such effects by introducing a general relationship between the speed of adjustment parameter μ_t and variables describing the interest group pressure (**POL**):

$$\mu_t = h(\textbf{POL}) \tag{4}$$

The general formulation assumes that the relative importance of the non-pecuniary costs depends on interest group activity. The idea is that opposition to reallocations is related to pressure from interest groups. The reduced form of the demand system, given by equation (5), is obtained by substituting (1′) and (4) into (3′):

$$A_{it} = \frac{1}{1 + h(\textbf{POL})} \ (\alpha_{i0} + \alpha_{i1}\log Y_t + \alpha_{i2}\log I_t + \alpha_{i3}Z_t + \alpha_{i4}\textbf{POL})$$

$$+ \left(1 - \frac{1}{1 + h(\textbf{POL})}\right) A_{it-1} \tag{5}$$

This model is implemented with the operationalization of interest group variables explained below. The **POL**-variables reflecting interest group activity are allowed to influence both the desired allocation and the implementation process. Hypotheses about these variables are discussed in the proceeding section.

5. Interest groups and adjustment inertia

The importance of interest groups for the formation of public policy has been addressed in an expanding literature. The review articles of Potters and van Winden (1994) and Bendor (1988) show two alternative interpretations, the external groups representing demand for public services and the internal bureaucracy respectively. As mentioned in the introduction, it is our understanding that the two interact in local public policies. Partly they try to convince voters, parties and politicians in the public debate. Partly they channel their influence through the internal organizational processes of local authorities. The complexity of the decision making system is hard to represent in an empirical study. Given the dominant party/coalition model, we have concentrated the attention to the politicians deciding the resource allocation in each local authority. The interest group activity is measured by the political pressure of interest groups perceived by the decisive policy makers.

The existing studies of interest groups as demanders of services emphasize the influence achieved through the political process. The interest function ap-

proach, e.g., as applied by Renaud and van Winden (1991), assumes a cooperative determination of government policy. Numerical strength of the different groups involved typically influences government policy. This aspect is included in this study, since the age composition of the population is allowed to affect the demand for services. The literature on lobbying and voting functions captures aspects that are relevant to our analysis. The models on lobbying, e.g., Potters and van Winden (1992), emphasize the information advantage of interest groups. Contributions and other types of support to campaigns and parties are central to the studies oriented towards voting, e.g., Poole and Romer (1985). It follows that interest group activities are multi-dimensional and connect to the political system in various ways. Instead of basing the study on different characteristics of the relevant interest groups, empirically a very difficult task, we have addressed the other side of the equation, the pressure perceived by the politicians. Given the empirical problems of this area, alternative strategies to documentation on interest group pressure are fruitful.

The pressure measured in this study also can be related to the internal channel of effect, local government employees influencing the policy implementation. It is well established that the demand for local public services is different for government employees compared to other residents (Bergstrom, Rubinfeld and Shapiro, 1982). Sørensen (1994) has shown that local politicians employed in specific public sectors demand higher service levels of these sectors than other elected representatives. Given this documentation of the preferences and interests of local government employees, they are expected to try to influence the resource allocation. This may be done in several ways. First, local government employees are able to affect resource allocation directly by numerical power (bureaucratic voting), informational advantages (capacity to misrepresent production costs), agenda control (authority to define the voting agenda) and recruitment to political councils (governments employees as elected representatives). Second, their well-organized trade unions may reinforce the external pressure from less organized client groups by taking initiative to campaigns and demonstration directed towards local politicians. This is particularly the case for the teacher unions, who usually mobilize parents and pupils when the educational sector is threatened by cutbacks.

The empirical basis of the analysis is a survey questionnaire to local politicians. Compared to other ways of measuring pressure, the survey approach has both strengths and weaknesses. A first strength relates to where pressure is measured. The existing literature has measured pressure from where it originates (the interest group). For example, Mueller and Murrell (1986) measure pressure by the number of interest groups in a country, while Renaud and van Winden (1991) use the size of the various groups. However, to a great extent it remains unanswered how these interest group characteristics affect the actual pressure. Because the survey method measures pressure at its destination

(the politicians), the difficult task of determining how interest group characteristics are translated into pressure is avoided. The possibility of obtaining a direct measure of the pressure towards a particular service sector in a particular municipality is another strength of the method. On the other hand, when conventional measures are used, the researcher need to know where each group directs its pressure and how the activity is spread among several receivers. The weakness of the survey approach particularly relates to measurement error and the possibility of strategic response. First, the local politicians have little or no experience in assessing the degree of pressure, and the perception of the ordinal scale may differ. But as long as there is no systematic variation across municipalities in the perception of the scale, this will not bias our results. It is only the variation across municipalities that matters in the empirical analysis. Second, high levels of pressure may be used as an excuse in authorities where the desired policy (of whatever reason) is not implemented. Such strategic responses may bias our results. Despite these weaknesses, we believe that the survey methodology is a fruitful alternative to explore. In particular, it has the potential of generating indicators of better validity than the existing measures.

The survey data was collected by means of a mailed questionnaire that was filled in by the elected politicians in the period December 1990 through February 1991. All representatives in 81 municipalities were mailed at their home address to secure independent answers. Two follow-up contacts were performed. The average municipality returned 27 questionnaire, ranging from 8 responses in the smallest authority to 54 answers from the largest municipality. The final sample comprised 2.844 elected representatives, denoting an overall response rate of 71 percent.

Pressure is measured by a closed question. The politicians were asked to assess the degree of pressure exerted by special interest groups and pressure channeled through mass-media.[2] For each of the five local government responsibilities, the representatives indicated whether pressure was very strong (3), strong (2), weak (1) or absent (0).

Some representatives have a direct responsibility for a particular sector. All members of the local councils are assigned to committees, such as the education committee and the health care committee. If the committees are influential defenders of their sector budgets, the interest groups are likely to direct the pressure towards the corresponding committees. The committee members should be given particular attention in the operationalization of the pressure indicators. However, the survey data does not suggest that committee members perceive a higher level of pressure than other representatives. For example, the average interest group pressure on the members of the educational committee is 1.80 compared to an average pressure of 1.76 among all representatives. The corresponding figures for the health care/care for the elderly sector are 1.44 and 1.51, i.e., the members of the health care committee perceive lower pressure than the average representative. Consequently, we choose not to separate

Table 2. Pressure on local politicians from special interest groups and mass media 1990/1991 (N = 65)

	Special interest groups (INT)			Mass media (MED)		
	Min	Mean	Max	Min	Mean	Max
Education	0.89	1.74	2.63	0.46	1.36	2.06
Health care	1.05	1.51	2.00	0.50	1.38	2.00
Kindergartens	1.11	1.66	2.67	0.22	1.39	2.33
Culture	0.44	1.12	2.00	0.31	0.92	1.63
Infrastructure	0.68	1.15	2.00	0.40	1.01	2.00
Average	0.94	1.44	2.13	0.53	1.21	1.93

3: Very strong pressure, 2: Strong pressure, 1: Weak pressure, 0 = No pressure.

between committee members and other representatives in the operationalization of the pressure variables.

The dominating party/coalition is defined dependent on the election outcomes during the period under study, i.e., the lcoal elections in 1983 and 1987. The parties have been divided in three groups, conservatives, center parties and socialists. A party/coalition is defined as dominating if it held the majority in the local council after both elections. If a dominating coalition exists, only the response of its members are taken into account. 29 of the 65 authorities included in the study have a stable majority.[3] For the other municipalities, we assume that a compromise among the parties is worked out. Hence, the responses of all politicians of each authority are used to calculate the pressure variables. The pressure indicators are calculated as the mean of the relevant responses for each of the authorities.

The responses reported in Table 2 show that perceived pressure varies both between municipalities and between sectors. Average pressure from interest groups varies from 0.94 (weak) to 2.13 (strong), while average media pressure varies from 0.53 (weak/absent) to 1.93 (strong). Education, health care/care for the elderly and kindergartens are publicly provided private goods directed towards specific subgroups of the publication. It is interesting to notice that the perceived pressure is much stronger for these sectors than for the more public good producing sectors, cultural services and infrastructure.

The correlations between the interest group indicators were generally positive. The correlations ranged from 0.10 (between education and infrastructure) to 0.45 (between the cultural sector and the infrastructure sector). The correlations between the indicators of media pressure were larger, ranging from 0.48 to 0.72. The correlations between interest group pressure and media pressure for each sector were also positive. Group pressure and media pressure reinforce another, and this is particularly the case in the educational sector. We expect

to obtain similar, though not identical, results in the econometric analysis of special interest groups and mass media.

The chosen approach does not identify the sources of influence of the different interest groups, and assumes that the intensity of pressure is exogenous relative to the local service production. There is some empirical support for this simplification. Once the interest groups have established themselves, they utilize all organizational resources irrespective of the potential short-run gains of the lobbying activity. A study by Murrell (1984) indicates that the size of government does not impact on interest group activity. Although Murrell's study relies on a cross-country design, and analyzes the number of interest groups rather than political pressure, it provides some basis for our assumption that interest group pressure is exogenous in relation to the mix of local government output.

The basic hypothesis of interest group models is that interest groups promote their own interests. In our context, this assumption is easy to operationalize. The interest pressure identified with groups and media are associated with specific local government service sectors. It follows that interest groups can be assumed to maximize the budget of their "own" sector. In terms of the desired allocation within the given local government budget, interest group pressure related to one sector is promoted at the cost of all other sectors. They have a potential influence on the desired composition of services in addition to the preferences of the dominant party / coalition and the age composition of the population.

The relationship between the interest group pressure and the dynamic adjustment process refers to the policy implementation. In the public debate, sluggishness of adjustment often is linked to local public employees defending their interests. It must be understood as a fundamental asymmetry: The defensive interest groups are in a stronger position than the offensive groups promoting new services. Pressure to prevent cutbacks is more efficient than pressure to increase spending. If this asymmetry is true, the sluggishness will be increasing with pressure.

If the effects of interest group pressure are more symmetric, it is of importance if the pressure relates to defending old activities or promoting new. Pressure related to sectors experiencing declining demand relative to others will counteract reallocation of resources. On the other hand, pressure for services experiencing increased demand wil stimulate reallocation. A sectoral disaggregation of spending and pressure is necessary to test these effects of interest group activity. The formulation of the test must allow pressure both to induce sluggishness and strengthen reallocations.

The relationship between influence and the size of a group is widely discussed in the literature on interest groups. Becker (1983, 1985) separates between pressure and influence. Pressure depends on the resources spent on lobbying

activity and the size of the group, while influence, or the impact, depends on pressure from all groups and other variables. In our context, it seems appropriate to interpret the two indicators INT and MED as pressure in the way Becker uses the term. Potters and van Winden (1994) argue that size should be included among the other variables affecting influence, and that the marginal influence of a group's pressure is increasing in its size. This suggests that interaction terms between the pressure indicators and the size of the relevant client groups should be included in the empirical analysis.[4]

6. Operationalization of the model

The hypotheses developed in the previous section are handled with different versions of the general model. The benchmark model assumes constant speed of adjustment, equal to $1/(1+\beta_0)$, and excludes the political-institutional variables, i.e., the vector **POL** is empty:

$$\textbf{POL} = \Theta, \mu = \beta_0 \tag{6}$$

models M1 and M2 capture the influence of special interest groups and mass media respectively. The two are best interpreted as alternative measures of pressure, and are estimated separately. Two aspects of the political-institutional factors are included in both models. First, the effect on the desired allocation. Second, the effect on the speed of adjustment towards the desired allocation. The two models are:

$$\textbf{POL} = [INT_2, \ldots, INT_6] \tag{M1}$$

$$\mu_t = \beta_{10} + \sum_{i=2}^{6} \beta_{1i} \, INT_i + \sum_{i=2}^{4} \delta_{1i} \, INT_i CL_{it} + \sum_{i=5}^{6} \gamma_{1i} \, INT_i D_i$$

$$\textbf{POL} = [MED_2, \ldots, MED_6] \tag{M2}$$

$$\mu_t = \beta_{20} + \sum_{i=2}^{6} \beta_{2i} \, MED_i + \sum_{i=2}^{4} \delta_{2i} \, INT_i CL_{it} + \sum_{i=5}^{6} \gamma_{2i} \, MED_i D_i$$

The subscript i refers to numbering of the sectors used in Table 1. The variables are defined as follows:

INT_i – pressure from special interest groups related to sector i
MED_i – pressure from the mass media directed towards sector i
CL_{it} – the relative size of the client group related to sector i
D_i – a dummy variable that equals 1 if sector i is growing, 0 otherwise.

Growing and declining sectors are defined in the following way: A sector is growing (declining) if its expenditure share is higher (lower) in 1990 than in 1984. This crude classification is primarily chosen due to its simplicity. The few authorities where the educational sector is growing (4 authorities), the health care / care for the elderly sector is declining (8 authorities) or the child care sector is declining (4 authorities) are excluded from the analysis. We find the number of observations insufficient to estimate separate coefficients for these authorities.

The expected signs of the β, γ and δ coefficients depend on the effects of symmetry and asymmetry discussed in Section 5. Assuming a symmetric effect of interest groups in contracting and expanding sectors, the signs are determined by the defence against decline versus the promotion of growth. Let us start with primary education (i = 2), health care / care for the elderly (i = 3) and kindergartens (i = 4). The term $\beta_{ki} + \delta_{ki} CL_{it}$ (k = 1,2 for group and media pressure) measures the effect of INT_i or MED_i on the costs of adjustment. Consequently, we expect $\beta_{ki} + \delta_{ki} CL_{it}$ to be positive for the declining educational sector and negative for the growing health care / care for the elderly and child care sectors. Pressure from defensive groups increases the opposition to reallocations, while pressure from offensive groups has the opposite effect. Primary education, health care / care for the elderly and kindergartens have well-defined client groups, and we expect that the marginal impact of a given pressure is positively related to the relative size of the groups. The terms $INT_i CL_{it}$ and $MED_i CL_{it}$ capture the possible interaction between pressure and size. When the relative size increases the impact of a given pressure, and the effect of interest groups is symmetric in growing and declining sectors, we expect δ_{ki} to be positive for the declining educational sector and negative for the growing health care / care for the elderly and child care sectors.

The public good producing sectors cultural services (i = 5) and infrastructure (i = 6) do not have well-defined client groups. However, we need to separate between municipalities where the sectors are growing and where they are declining. The coefficient β_{ki} measures the effect of INT_i or MED_i on the costs of adjustment in municipalities where sector i is declining, while $\beta_{ki} + \gamma_{ki}$ measures the effect in municipalities where sector i is growing. Consequently, we expect β_{ki} to be positive and $\beta_{ki} + \gamma_{ki}$ to be negative. Pressure from defensive groups increases the opposition to reallocations, while pressure from offensive groups has the opposite effect.

The expected effect of the **POL**-variables on the desired allocation is more straightforward: An increase in INT_i or MED_i is expected to increase the desired expenditure share in sector i at the expense of at least one of the other sectors.

The following modifications are made in the implemented models: First, six sociodemographic variables are allowed to influence the desired allocation.

The age composition on the population / the relative size of the client groups is represented by CL_2 (the share of youth), CL_3 (the share of elderly) and CL_4 (the share of children). Additional variables are the population density DE, the population growth GR and the inverse of the population size PINV. Second, the constant terms of the demand equations are allowed to shift from year to year representing factors not included (such as shift in the division of labor with the counties and the national government). The empirical analysis is based on a combined cross section and time series data set. For all models estimated the range of the time series is 1984–1990. Data for 442 local governments (out of 448 in total) were available for the benchmark model, while the survey used to measure the two types of interest group pressure only covers 79 of these 442. Moreover, 14 authorities are excluded because the educational sector is growing, the health care / care for the elderly sector is declining or the child care sector is declining. This leaves us with 65 cross sections units in estimating models M1 and M2.

The model should not be estimated by OLS of three reasons. First, the error terms of the demand equations for each unit will be correlated because of the budget constraint. Thus the demand functions should be estimated as a system instead of equation by equation to obtain efficient estimates. To avoid singular covariance matrix, one of the equations must be left out from the estimation. The demand equation of this sector is determined by the budget restriction and the estimated coefficients for the other sectors. In the empirical analysis cultural services are chosen as the residual sector. Second, the β's, the δ's and the γ's imply restrictions across the equations in the demand system. A system technique is required to capture these restrictions. Third, since the demand equations are non-linear in the β's, δ's and γ's, a non-linear estimation method is needed. In estimating the models M1 and M2 we used the "Full Information Maximum Likelihood" method (FIML). This is a system technique that handles the non-linear restrictions. The benchmark constant speed of adjustment model is linear in the parameters, and is estimated by the Zellner "Seemingly Unrelated" method (SUR).

7. Adjustment inertia documented

The complete set of estimated coefficients of the benchmark model is shown in the appendix Table A1. The reported estimates reflect the short run effect of the exogenous variables.[5] The model accounts for most of the variation in priorities between Norwegian local governments. R^2 varies from 0.71 in health care / care for the elderly to 0.94 in primary education.

The results indicate serious sluggishness in the adjustment process consistent with the results of Borge and Rattsø (1993a). Only 11.5% of the desired change

Table 3. The influence of special interest groups (M1) and pressure through the media (M2), modified model versions

	Education	Health care	Kindergt.	Culture	Infrastr.
Model M1:					
Speed of adjustment:					
Contracting[a]	3.175			3.353	−2.324
	(3.12)			(1.93)	(−2.01)
Expanding[b]		−2.897	0.596	0.707	−1.370
		(−2.06)	(0.53)	(0.53)	(−0.98)
Interaction[c]	−0.255	−0.437	−0.380		
	(−1.20)	(−3.92)	(−1.62)		
Model M3:					
Speed of adjustment:					
Contracting[a]	5.424			0.736	3.077
	(3.95)			(0.45)	(1.69)
Expanding[b]		−3.117	−3.312	−1.976	4.288
		(−2.06)	(−2.18)	(−1.20)	(2.05)
Interaction[c]	−0.484	−0.488	−0.138		
	(−1.72)	(−3.44)	(−0.46)		

T-values in parentheses.

[a]The effect of INT_i or MED_i in municipalities where sector i is contracting, i.e., β_{ki} for cultural services (i = 5) and infrastructure (i = 6) and $\beta_{ki} + \delta_{ki}CL_{it}$ for the educational sector (i = 2). Sample average of CL_{it} is used in the latter case.
[b]The effect of INT_i or MED_i in municipalities where sector i is expanding, i.e., $\beta_{ki} + \gamma_{ki}$ for cultural services (i = 5) and infrastructure (i = 6) and $\beta_{ki} + \delta_{ki}CL_{it}$ for health care / care for the elderly (i = 3) and kindergartens (i = 4). Sample averages of CL_{it} are used in the latter cases.
[c]The estimate of δ_{ki}.

is implemented in the first year. In general the estimated sluggishness is influenced by the handling of community-specific effects. Borge and Rattsø (1993b) show how the degree of sluggishness is modified by taking into account fixed and random effects. The present analysis, which focuses on the variation in adjustment inertia across municipalities, assumes no community-specific effects.

The variable speed of adjustment models M1 and M2 enable us to investigate if and why the speed of adjustment varies across municipalities. We started out by estimating the general version of the models, i.e., interest group activity and media pressure were allowed to influence the speed of adjustment towards the desired allocation as well as the desired allocation itself. The general formulation is reported in the appendix Table A2. The direct effects of pressure on the desired allocation are expected to be positive, but the estimation results do not support this hypothesis. For both models the direct effects were significantly positive in only one of five sectors. They do influence the desired allocation in

a static formulation of the model, but not when endogenous speed of adjustment is allowed. The following discussion relies on model versions where interest group activity and media pressure are only allowed to affect the speed of adjustment towards the desired allocation, not the desired allocation itself. The main conclusions regarding the dynamic processes are the same whatever model formulation is used.

Selected results from estimating the modified versions of models M1 and M2 are shown in Table 3. The hypothesis of a fundamental asymmetry between the effect of pressure from growing and declining sectors finds little support. Defensive interest groups are able to block reallocations, while pressure from offensive groups speeds up the adjustment process. This is especially the case for the main declining sector, primary education, and the main growing sectors, health care/care for the elderly and kindergartens. For these three sectors five of six coefficients come out significant and with the expected sign according to the hypothesis of symmetric effect.

Special interest groups associated with primary education are able to delay the reallocation of resources out of schools. On the other hand, interest groups associated with the growing health care/care for the elderly sector are able to speed up the adjustment towards growth in this sector. The interests related to primary education delay the reallocation of resources to health care/care for the elderly. In addition, interest group pressure towards cultural services slows down the reallocation process in municipalities where the sector is contracting. The only result not in accordance with our hypothesis is that interest group activity related to infrastructure speeds up the adjustment process in municipalities where the sector is declining. Infrastructure is more of a local public good compared to schools and health care/care for the elderly, and the decision making process may be different.

Pressure through the media has more or less the same effect as special interest groups. Media pressure related to primary education contributes to sluggish adjustment, while media attention to health care/care for the elderly and kindergartens promotes speedy adjustment. Again, the only result not in accordance with the hypothesis of symmetric effect relates to the infrastructure sector, where media pressure slows down the adjustment process in all local governments.

The marginal impact of pressure was expected to be an increasing function of the relative size of the client groups. The estimates of these interaction terms are shown in the third and sixth line of Table 3. In the health care/care for the elderly sector we find strong support for such interaction between pressure and size. The interaction term is significantly negative in both models, implying that a high share of elderly increases the marginal impact of pressure from special interest groups and the media. The results for primary education and kindergartens are more mixed. For kindergartens the estimates are of the expected

Table 4. Calculated adjustment coefficients (λ_t) from the model M1 and M2

	Min	Mean	Max
M1	0.062	0.110	0.320
M2	0.056	0.107	0.254

negative sign, but only marginally significant (M1) or insignificant (M2). Finally and contrary to our expectations, the interaction term for primary education is negative in both models.

The adjustment coeffient (λ_t) for each local government can be calculated based on the results above. λ_t measures the share of the desired change which is implemented in the first year. Table 4 reports some descriptive statistics for the calculated adjustment coefficients. It appears that local interest groups have important consequences for the reallocation process. The share of the desired adjustment implemented in the firts year varies from 6.2 to 32.0% (coefficient of 0.062 to 0.320). The mean of 11.0% corresponds well to the benchmark model. The local authority with the weakest interest organizations in education compared to other sectors is able to implement half of the desired adjustment in less than 2 years. On the other hand, in the local authority where the educational groups have their stronghold, half of the desired allocation is reached after more than 10 years.

The local media situation has a lot to say for the actual outcome. The share of desired reallocation implemented in the first year varies between 5.6 and 25.4%. Again, an average of 10.7% corresponds well to the benchmark model. When media pressure is biased towards child care and sectors experiencing higher demand, the half way to the desired allocation can be reached during 2.4 years. When the media pressure is oriented towards the defense of education, 12 years is needed.

According to the above results, local governments with weak interest organizations and media pressure in education relative to health care/care for the elderly and kindergartens have an advantage in handling the adjustment process. However, normative conclusions are difficult to reach. First, it is difficult to judge whether high or low speed of adjustment is most appropriate. In the present Norwegian situation the elderly benefit from high speed of adjustment, while kids in school lose. Hence, interpersonal comparisons, as well as a complete stochastic and dynamic model, is needed to calculate the optimal speed of adjustment. Second, special interest groups and media pressure are not necessarily welfare distorting. In a second best world they may be means by which the voters can transmit their preferences to politicians, particularly between elections.

In discussing the effects of total per capita expenditure, private consumption

and the sociodemographic variables, we rely on the estimates from the benchmark model reported in Table A1. The responses in model M1 and M2 (not reported) are similar.

Central administration, health care/care for the elderly, kindergartens and cultural services take an increasing share of the budget when total spending is growing, i.e., the Engel elasticities for these services are greater than one. Primary education is the only service classified as a necessary good. Similar results are obtained in other Norwegian studies such as Rattsø (1989) and Borge and Rattsø (1993a, 1993b). The finding that primary education has an Engel elasticity less than unity is consistent with most U.S. studies, see Inman (1979) for an overview.

Private consumption has an independent impact in the demand function, and it cannot be treated as separable to local public services. A narrow interpretation of the result implies that private consumption on average is complementary to infrastructure, and an alternative to administration and primary education. It seems more appropriate to interpret the level of private consumption as a broad indicator of the local preferences. Authorities with a rich private sector prefers infrastructure to primary education.

The variables representing the age composition of the population all come out with the expected positive sign for their corresponding sector. An increase in the share of youths contributes to a significantly higher expenditure share for primary education, while the share of elderly has a similar effect on resources allocated towards health care/care for the elderly. However, spending on kindergartens is not significantly related to the share of children in the community. Because of the exegenous budget constraint, higher expenditures in one sector has to be financed by cutbacks in other sectors. This explains why a high share of elderly reduces the expenditures on primary education, kindergartens and cultural services, and that a high share of youth (7–15 years old) contributes to lower spending on kindergartens, cultural services and infrastructure.

The additional sociodemographic variables included also seem to be important for the priorities. The effect of population size for central administration and primary education can be interpreted as economies of scale. The resources "saved" in large municipalities are spent on health care/care for the elderly, kindergartens and cultural services. Lower population density increases the use of resources in primary education at the expense of cultural services. Growing municipalities prefer high expenditure shares for kindergartens and health care/care for the elderly and low expenditure shares for primary education and infrastructure.

8. Concluding remarks

Local governments in Norway represent ⅔ of public sector service production with particular emphasis to education, health care/care for the elderly and other services oriented directly towards the households. The age composition of the population has shifted dramatically towards the elderly during the last decade. Consequently, the composition of the service demand has moved from education towards health care/care for the elderly.

A dynamic model of local government resource allocation is developed to analyze the responses to changing demand. Political and institutional factors are allowed to influence the speed of adjustment in a partial adjustment framework. The speed of adjustment varies a lot between municipalities, and is shown to reflect the activity of special interest groups and media pressure. Groups promoting services experiencing increased demand tend to stimulate restructuring. This is certainly true for kindergartens and health care/care for the elderly during the period under study. On the other hand, strong interest groups associated with declining sectors are able to block the adjustment towards the desired allocation. The pressure groups related to primary education represent an important part of the explanation of the sluggishness observed.

The model framework presented offers an opportunity to investigate the dynamics of the decision making process guiding local government service production. Future research should improve upon the theoretical foundation of the model. The linkages between political-institutional conditions and voter preferences are hard to nail down. The conclusions reached already at this stage should be of interest for altruistic politicians.

Notes

1. The subscript t is suppressed since there is only cross section variation in the **POL**-variables.
2. The survey questions were: (1) "To what extent do you think that local organizations, protest groups or special interest groups influence the local governments willingness to increase the supply of each of the following areas?" (2) "To what extent do you think that attention from mass media impacts the local governments willingness to increase the supply on each of the following areas?"
3. The survey comprised 81 authorities, but only 65 of these are included in the empirical analysis, see Section 6 for further discussion.
4. The use of interaction terms was suggested to us by a referee.
5. That is, the reported coefficients of logY equal the estimates of $\lambda\alpha_{i1}$.

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Appendix

Data sources

To estimate the model we used the local government accounts, a databank of income and taxes paid and a databank of social, economic and demographic variables describing each municipality. The political-institutional variables are constructed on the basis of a survey conducted in 1990–91. On the basis of these data sources the following variables have been constructed (separate for each authority):

Y – aggregate consumption expenditure of the sectors included in the study per capita, deflated by the national account price index for local government consumption

I – average after-tax income per capita, deflated by the consumer price index

A_{it} – consumption expenditure in sector i in year t as % of aggregate consumption expenditure

CL_2 – the share of the population between 7 and 15 years of age (youths)

CL_3 – the share of the population above 67 years of age (elderly)

CL_4 – the share of population below 7 years of age (children)

DE – population density measured as the average travel distance to the center of the municipality

GR – average annual growth in the population size from 1984 to 1988

PINV – the inverse of the population size

INT_i – pressure from interest groups related to sector i

MED_i – pressure from media directed towards sector i.

Table A1. Combined cross section time series analysis 1984–90, the benchmark model

	Admin.	Education	Health care	Kindergt.	Culture	Infrastr.
			$\lambda = 1/(1+\beta_0)$: 0.115 (30.94)			
logY	0.788	−2.488	0.632	0.883	0.532	−0.023
	(3.25)	(−13.21)	(3.00)	(8.82)	(5.43)	(−0.13)
logI	−0.293	−0.291	−0.096	0.999	0.064	0.516
	(−2.42)	(−1.85)	(−0.53)	(1.18)	(0.77)	(3.54)
CL_2	0.033	0.176	−0.004	−0.089	−0.033	−0.084
	(1.63)	(6.46)	(−0.12)	(−6.18)	(−2.33)	(−3.39)

Table A1. Continued

	Admin.	Education	Health care	Kindergt.	Culture	Infrastr.
CL_3	0.012	−0.035	0.057	−0.025	−0.012	0.003
	(1.43)	(−3.17)	(4.45)	(−4.18)	(−1.98)	(0.30)
CL_4	−0.080	0.023	0.054	0.010	−0.004	−0.002
	(−3.28)	(0.73)	(1.48)	(0.58)	(−0.23)	(−0.08)
DE	−0.002	0.010	−0.005	−0.002	−0.005	0.004
	(−0.85)	(3.49)	(−1.47)	(−1.64)	(−3.27)	(1.54)
GR	0.052	−0.103	−0.111	0.086	−0.035	0.112
	(1.24)	(−1.90)	(−1.80)	(2.96)	(−1.24)	(2.21)
PINV	595.9	424.9	−768.4	−191.6	−262.5	201.8
	(6.10)	(3.41)	(−5.38)	(−2.85)	(−3.96)	(1.74)
SE	1.3221	1.7027	1.9594	0.9142		1.5847
R^2	0.83	0.94	0.71	0.89		0.86

T-values in parentheses.

Table A2. The influence of special interest groups (M1) and pressure through the media (M2)

	Education	Health care	Kindergt.	Culture	Infrastr.
Model M1:					
Level effect	−3.276	1.041	−1.895	−1.714	4.098
	(−1.28)	(0.30)	(−0.92)	(−1.15)	(2.23)
Speed of adjustment:					
Contracting[a]	5.725			−8.121	−0.361
	(3.06)			(−3.10)	(−0.29)
Expanding[b]		−0.533	−3.128	−10.479	0.534
		(−0.20)	(−1.29)	(−4.44)	(0.37)
Interaction[b]	0.501	0.013	−0.797		
	(5.57)	(0.11)	(−4.58)		
Model M2:					
Level effect	0.488	−6.798	1.321	5.859	−0.754
	(0.18)	(−2.19)	(0.75)	(2.96)	(−0.26)
Speed of adjustment:					
Contracting[a]	6.608			−3.217	10.450
	(3.82)			(−1.42)	(4.68)
Expanding[b]		−7.354	−8.138	−4.437	12.873
		(−3.05)	(−3.08)	(−1.69)	(5.44)
Interaction[c]	−0.806	−0.064	0.178		
	(−3.36)	(−0.57)	(0.70)		

T-values in parentheses.

[a] The effect of INT_i or MED_i in municipalities where sector i is contracting, i.e., β_{ki} for cultural services (i = 5) and infrastructure (i = 6) and $\beta_{ki} + \delta_{ki}CL_{it}$ for the educational sector (i = 2). Sample average of CL_{it} is used in the latter case.
[b] The effect of INT_i or MED_i in municipalities where sector i is expanding, i.e., $\beta_{ki} + \gamma_{ki}$ for cultural services (i = 5) and infrastructure (i = 6) and $\beta_{ki} + \delta_{ki}CL_{it}$ for health care/care for the elderly (i = 3) and kindergartens (i = 4). Sample averages of CL_{it} are used in the latter cases.
[c] The estimate of δ_{ki}