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Public employment and the double role of bureaucrats

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Public employment and the double role of bureaucrats*

by

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Abstract

Bureaucrats in the government sector have a double role since they are both suppliers and demanders of public employment; they are publicly employed (supply labor) and they have an important say in deciding the size of the municipal employment (demand labor). In this paper we present and estimate a theoretical model that focuses on this double role of bureaucrats. The predictions from the theoretical model are supported by our empirical results: The estimates based on data from Swedish municipalities 1990–2002, show that wages have smaller effects on the demand for bureaucrats than on the demand for other types of public employees. Actually wages have no significant effect on the number of bureaucrats the municipality employs.

Keywords: Public employment, bureaucrats
JEL-codes: H7, J45

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1 Introduction

Public employment constitutes a large part of total employment in many western countries. In 1995, e g, the average public sector share of total employment in the OECD countries was approximately 20 percent, ranging from 6 percent in Japan to approximately 30 percent in the Scandinavian countries.[1] In order to understand how the labor market works, we thus need to understand the public labor market, which differs from the private one in several aspects. Most important is perhaps the fact that decisions are made by politicians and bureaucrats rather than by business leaders.[2] It is far from obvious that the first group is motivated by the same objectives as the second group; politicians and bureaucrats might, for example, be interested in maximizing votes or budgets.[3] This implies that the number of persons employed in the public sector will not only be based on efficiency and/or equity considerations, but that other aspects are important as well.

In this paper, we will focus on the role of bureaucrats, which we argue is double: Bureaucrats are involved in the political process that makes decisions about how many people to employ in the public sector at the same time as they supply the labor that is employed. In this paper we present a theoretical model focusing on this double role of bureaucrats. The implication from the model is that increased wages for bureaucrats have smaller effect on labor demand than increased wages for other types of bureaucrats. We estimate the model on panel data from Swedish municipalities 1990–2002 and find evidence that supports the theoretical model.

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[1] The calculation is based on the figures presented in *Table 1* in Gregory & Borland (1999). It can be noted that Japan was the only country with a share less than 10.

[2] Gregory & Borland (1999) identifies four reasons to why the available control mechanisms are not sufficient to restrain politicians and bureaucrats to pursue their own objectives in policy making. The first reason is the free-rider problem that occurs since each individual has few incentives to collect information needed to monitor the decision makers. Second, incentive-type contracts are hard to implement, since it's hard to measure output in the public sector and since the structure of authority is very complex. The third is that competition in the public sector is rare. Finally, the two existing control mechanism, voting in elections and voting with your feet, are both rather weak; elections for example are only held every fourth year in Sweden.

[3] For a discussion of politicians as vote-maximizers, see, e g, Dixit & Londregan (1996). For a discussion of the role of bureaucrats, see, e g, the seminal work by Niskanen (1971). See also Mueller (1989, ch 14) for an overview of government and bureaucratic behaviour in public choice models.

That bureaucrats matter for public decision making process is not a new idea in the public economy literature.[4] In the most famous work Niskanen (1971) argues that bureaucrats are budget-maximizers that take advantage of the fact that they i) are the monopolist supplier, ii) know the true cost, and iii) are institutionally allowed to make take-it-or-leave-it budget proposals, in order to increase budgets beyond efficiency. Romer & Rosenthal (1978, 1979) develop the monopoly model further, showing that the resulting spending level typically is higher than the one preferred by the voters.[5] In the models by Niskanen and Romer & Rosenthal, voters and politicians representing the voters play an extremely passive role. This might be true for voters, but is perhaps not equally likely for politicians. Eavey & Miller (1984) make this observation and question whether bureaucrats really are able to just impose an outcome on a powerless legislative. Isn't it rather the case that policy is set in negotiations between bureaucrats and politicians representing voters?[6] Using experimental data they test these two competing hypothesis and find that the situation is better described as a bargaining game.[7] Common to both of these types of models of bureaucratic behavior is the assumption that bureaucrats care about the size of the budget. Hence, public spending is the variable examined. In this paper we focus on public employment, and this makes another mechanism important; namely the fact that bureaucrats, involved in the decision-making process, actually employ themselves. Hence, we leave the ad-hoc assumption of budget-maximizing bureaucrats and instead model bureaucratic behavior based on constrained utility maximization.

The paper is organized as follows: In the next section we present our theoretical model. *Section 3* discusses the data and some Swedish institutional facts and *Section 4* present the empirical specification of the theoretical model. In *Section 5* we present the results. Finally, *Section 6* concludes.

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[4] That bureaucrats matter for the political decision making process as well as in the implementation phase is long recognized by the political science literature, see e g Peters (1995).

[5] Romer & Rosenthal (1982) test the model on school budgets in Oregon and find that school budgets that are from 16.5 to 43.6 percent higher than the budget preferred by the median voter pass referenda.

[6] See also Breton & Wintrobe (1975) and Miller (1977) for models describing the bargaining game between politicians and bureaucrats.

[7] Kalseth & Rattsø (1998) use this bargaining model when investigating the pattern of administrative spending in Norwegian municipalities. They find that the strength of the incumbents' control over the municipal council plays a crucial role for administrative spending; the weaker the government is the higher is administrative spending.

2 Theoretical model

The purpose of this section is to present a model of bureaucratic behavior that does not rest on any ad-hoc assumption of preferences for large budgets. The model we suggest bears similarities to the model in Courant, Gramlich & Rubinfeld (1979) where the level of public spending is linked to public employee market power. In our model the behavior of bureaucrats, as well as other agents, is based on constrained utility maximization. The mechanism causing the preferences of bureaucrats to differ from others is that they both supply and demand public labor; the supply side is when they as individuals decide to work in the public sector at given wages and the demand side is when they as bureaucrats in the municipalities influence how many workers the municipality shall employ.

In the model it is assumed that each individual i gets utility from private consumption (C_i) and per capita spending of two publicly provided private goods (e^{nb} and e^{b}). For simplicity we assume that the publicly provided goods are perfectly matched with personnel requirements and that for one of the goods we need non-bureaucratic personnel and for the other bureaucratic personnel. Each individual maximizes the utility function

$$U_i = U(C_i, e^{nb}, e^{b}) \tag{1}$$

subject to two budget constraints; their individual budget constraint[8]

$$C_i = (1 - t)w_i \tag{2}$$

and the municipality's budget constraint

$$tN\overline{w} + G = w^{nb}E^{nb} + w^{b}E^{b} \tag{3}$$

where t is the local income tax, w_i is the individual's annual wage income, N is the population in the municipality, $\overline{w}$ is average annual wage in the municipality, G is intergovernmental grants, E^{nb} is the number of non-bureaucrats em-

[8] In the empirical part of the paper, we will estimate the model using data from Sweden. Equation (2) and (3) are therefore the proper specifications of the budget constraints since all taxes raised at the municipal level in Sweden come from proportional income taxation.

ployed by the municipality, E^b is the number of bureaucrats employed by the municipality, and w^{nb} and w^b is each group's annual wage rate.

Solving for t in equation (3) and substituting into equation (2) yields

$$C_i = w_i - \tau_i(w^{nb}e^{nb} + w^b e^b) + \tau_i g \quad (4)$$

where τ_i is voter i's tax price, given by $w_i/\overline{w}$, i e, the price that voter i must pay for a marginal increase in personnel and e and g denotes E and G expressed in per capita terms. We assume that the utility function in (1) is given by a Cobb-Douglas function:

$$U = aC^{\theta_1}e^{nb\theta_2}e^{b\theta_3} \quad (5)$$

In line with the earlier literature, we argue that there are two groups of people that are important in the municipal decision making process; politicians and bureaucrats. Politicians make the final decisions, whereas bureaucrats prepare and propose budgets.

Starting with the first group, politicians, we assume that their optimal demand function for municipal personnel is given by the decisive voter's preferences. Typically, it is assumed that the median voter is decisive and that the median voter can be identified as the voter with median income. However, assuming that the median voter is decisive is problematic when we are dealing with a multi-dimensional policy space. Instead, we will use a representative voter model, where we characterize the representative voter as the voter with mean income and assume that he or she is not employed in the municipal sector. Maximizing equation (5) subject to equation (4) yields the following first-order condition for each voter;

$$lne^{nb} = ln(\theta_2/(\theta_1 + \theta_2)) - ln\,\tau_i w^{nb} + ln(w_i + \tau_i g - \tau_i w^b e^b) \quad (6)$$

$$lne^{b} = ln(\theta_3/(\theta_1 + \theta_3)) - ln\,\tau_i w^{b} + ln(w_i + \tau_i g - \tau_i w^{nb} e^{nb}) \quad (7)$$

The representative voter's first-order conditions are thus given by

$$lne^{nb} = ln(\theta_2/(\theta_1 + \theta_2)) - lnw^{nb} + ln(\overline{w} + g - w^b e^b) \quad (8)$$

$$lne^{b} = ln(\theta_3/(\theta_1 + \theta_3)) - lnw^{b} + ln(\overline{w} + g - w^{nb} e^{nb}) \quad (9)$$

Using equation (9) to substitute for e^b in equation (8), yields the representative voter's optimal demand function for non-bureaucrats:

$$(10) \qquad lne^{nb} = constant - lnw^{nb} + ln(\overline{w} + g)$$

Analogously, the representative voter's optimal demand function for bureaucrats is given by:

$$(11) \qquad lne^{b} = constant - lnw^{b} + ln(\overline{w} + g)$$

Note that the demand functions are identical for bureaucratic personnel and non-bureaucratic personnel (except for the wage rate for the two types of employees). Differentiating equations (10) and (11) with respect to the voter's income (i e with respect to $\overline{w} + g$) yields a positive sign, implying that the richer the voter is, the more public employees does he or she demand. Differentiating equations (10) and (11) with respect to the wage rate of those employed by the municipality (i.e. with respect to w^{nb} and w^b) yields a negative sign, implying that the more expensive the publicly provided good gets, the less of it does the representative voter demand.

Let us next turn to the other group that is important in the municipal decision-making process, the bureaucrats. Their demand functions, corresponding to the demand functions in equations (10) and (11), will look like follows:

$$(12) \qquad lne^{nb} = constant - ln\,\tau_b w^{nb} + ln(w^b + \tau_i g)$$
$$(13) \qquad lne^{b} = constant - ln\,\tau_b w^{b} + ln(w^b + \tau_i g)$$

The bureaucrats' demand function for non-bureaucrats, given in equation (12), is hence very similar to that of the representative voter. Comparing from equation (10), we note that they only differ in the tax prices; while the representative voter faces a tax price of one, the bureaucrat faces a tax price of $w^b/\overline{w}$. Differentiation of equation (12) with respect to the wage or the income variable yields however the same sign on the derivatives as for the representative voter. The interesting thing to note is however the bureaucrats' demand function for bureaucrats; now, a marginal increase in the bureaucrats' wage rate not only

ends up as a cost variable but also as an income variable.[9] So, differentiating equation (13) with respect to the wage rate yields an undefined sign on the derivative.

So whose preferences is it that will be implemented, the politicians' or the bureaucrats'? Well, that will depend on the political strength of the two groups. If the bureaucrats have no power in the negotiation with the politicians, the effective optimal demand function for the number of bureaucrats employed in the municipality will be given by equation (11). If the bureaucrats have all the power (as in Niskanen type models), the optimal demand function for the number of bureaucrats will look like in equation (13). If both groups have some power, the optimal demand function will lie somewhere in between. That is, if the bureaucrats have some bargaining power, we would expect an increase in the bureaucrats' wage rate to have a smaller impact on the number of bureaucrats than the effect from an increase in the non-bureaucrats wage rate on the number of non-bureaucrats. We would also expect that this effect will be stronger the weaker the politicians are.[10]

3 Data and institutional background

In Sweden, approximately 35 percent of all employed persons are employed in the public sector, and most of those publicly employed work in the local sector[11]: *Figure 1* reveals that 30 percent of all employed are employed by the total local sector, approximately 20 percent are employed by the municipalities, and approximately 5 percent are employed by the state.

[9] In real world there exists payroll taxes, but we have here chosen to ignore these. Including them do not change the predictions from the model.

[10] Note that the theoretical model imposes unit elasticities for the demand of both non-bureaucrats and bureaucrats.

[11] The local government sector in Sweden is made up of 290 municipalities and 21 counties.

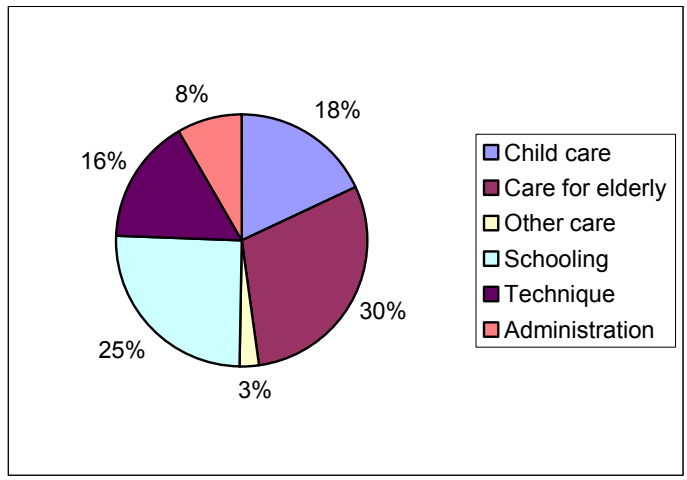
Figure 1. Number of employed in different sector

Source: Statistics, Sweden

Municipal employment can be divided into six sectors; child care, care for elderly, other care, schooling[12], technique and administration. These sectors also correspond to the municipalities' main responsibilities. *Figure 2* shows the relative sizes of the number of personnel in each sector.[13] From the figure we can note that old care, schooling and child care constitute the largest shares, whereas other care is the sector with fewest employees. Furthermore we can note that approximately 8 percent of the municipal employees are employed in administration. The administrative staff can be divided into three groups; principals, case workers and clerical staff. In the empirical application we will use administrative staff as a measure of bureaucrats, even though not all persons employed in the administration plays the role that the bureaucrats do in the theoretical model.[14]

[12] Including leisure activities.
[13] In 1991 teachers became a municipal responsibility and in 1992 parts of the personnel in elderly care that earlier had been a responsibility for the counties became a municipal responsibility.
[14] Ideally one would want to divide the administrative staff into smaller components where one could separate the group that can be called "bureaucrats" according to our theoretical model from others. This is however not possible.

Figure 2. Municipal employment by sector (share of total municipal employment)



Source: The Swedish Association of Local Authorities

In this paper we will contrast the demand for administrative staff with the demand for employees in the three largest sectors; child care, schooling and care for elderly.[15] We will do this using panel data on the number of full-time equivalents per 1000 inhabitants for the period 1990–2002[16]. From the theoretical model we expect wages to enter differently in the demand for administrative staff than for other municipal employees.

There are at least two reasons why Swedish municipalities constitute a good testing ground when analyzing topics related to the public sector labor market. First, municipalities in Sweden have a high degree of local self-government: They set their own taxes, have the statutory right to borrow, decide how much to spend on the services that they are responsible for (above a certain minimum

[15] We have also tried to contrast the demand for administrative staff with the demand for non-administrative staff, combining all the other sectors into one. However, the specification tests rejected that the model for non-administrative staff was correctly specified. Hence, it seems important to separate between different types of municipal services.

[16] The period we study is an extremely turbulent period in the Swedish labor market: Leaving the 1980s on a high note, with an overall unemployment rate of approximately 2 percent, the early 1990s saw a deep recession with unemployment rates reaching 9 percent, a level that for the last century only could be matched by the deep recession of the 1930s. And then, from approximately the mid 1990s and onwards, we have once again seen better times.

required level), and determine how much personnel to employ within each of the sectors for which they are responsible. Second, the Swedish municipalities meet the same institutional set-up, giving us a large sample of cross-sections, which makes it easier to get a correctly specified model.

In order to explain the demand for municipal labor demand we use wages in each sector, grants from the central government, municipal tax base, and demographic structure in the municipality. Summary statistics as well as exact definitions are given in the appendix.

4 Empirical specification

Section 2 gave us a theoretical specification of the demand equation (equations (10)-(13)). Our empirical specification of the demand equation is given by:

$$\ln n_{it} = (1-\lambda)\ln n_{it-1} + \alpha \ln \bar{y}_{it} + \beta \ln g_{it} + \rho \ln w_{it} + X_{it}\delta + f_i + \iota_t + \varepsilon_{it} \quad (14)$$

where n_{it} is the number of employed persons per capita in municipality i in year t in a specific sector, $\bar{y}_{it}$ is the mean taxable income in the municipality, g_{it} is per capita intergovernmental grants received by the municipality, w_{it} is the (monthly average) wage rate received by those employed by the municipality (differentiated by sector), X_{it} is a vector of other explanatory variables that might be important in the determination of n_{it}, f_i is a municipality-specific fixed effect, ι_t are time dummies, and ε_{it} is an error term. Employment, income, grants and wages are in logarithms, so the estimated parameters α, β and ρ are elasticities.

The econometric specification differs in four respects from the theoretical specification. First, to minimize problems with potential omitted variable bias, we control for other observable characteristics of the municipalities that might affect the demand for municipal personnel (X_{it}) as well as for unobserved characteristics of the municipality that remains stable over time and that might affect municipal employment (f_i), and for unobserved variables that affects all municipalities in the same way in a given year (ι_t).

Second, we allow for a dynamic adjustment in municipal employment. The reason for allowing for dynamics is that earlier studies in the literature on local public expenditures indicate a dynamic behavior of Swedish local governments (see, e.g. Dahlberg & Johansson, 1998, 2000; and Dahlberg & Lindström, 1998). This is probably especially important when considering personnel since the municipalities may not adjust labor freely; due to labor market regulations and hiring costs we would expect actual employment to deviate from the one optimal in a static framework. Following earlier literature (see, e g, Borge & Rattsø, 1993) we have therefore introduced dynamics by allowing for a partial adjustment rule. The relationship between the desired $\left(n_{it}^{*}\right)$ and the actual $\left(n_{it}\right)$ level of employment is formulated as a partial adjustment process. The actual change between periods t and $t-1$ is a fraction, λ, of the desired change:

$$n_{it} - n_{it-1} = \lambda\left(n_{it}^{*} - n_{it-1}\right) \tag{15}$$

Third, we allow the two income variables (average income and grants) to have heterogeneous effects on municipal employment. That they have different effects on expenditures have been shown in many empirical studies (see the literature on "flypaper effects", e g Bailey & Connolly, 1998), and Bergström, Dahlberg & Mörk (2004) also find that they have different effects on municipal employment.

Fourth, we leave the theoretical prediction of unit elasticities and allow the elasticities to differ from one.

Since we have both a lagged dependent variable and municipality-specific fixed effects in the regressions we need to use an IV-estimator (OLS estimation yields biased estimates, see Nickell, 1981). Furthermore, to take care of the potential simultaneity problem between employment and wages, we also instrument the wage variable. We will use the GMM estimator of the type developed and suggested by Anderson & Hsiao (1981) and estimate the model in first-differences, using the second and third lag of the employment and the first and second lag of wages as instruments for the lagged dependent variable and

the potentially endogenous wage variable. We will use the Sargan test for overidentifying restrictions to test the validity of the instruments.[17]

5 Results

5.1 Baseline estimates

The baseline estimates are presented in *Table 1*. Before turning to the parameter estimates, it can be worth noting that we cannot reject the null hypothesis that the instruments are valid/the model is correctly specified for any of the four sectors; as is clear from the last row in the table, the Sargan statistic is well below the critical value.[18]

Starting with the results for the variable of main interest, it is clear that the wage rate is an important variable in the determination of the number of personnel in all sectors but administration. For child care and schooling, the wage rate enters statistically as well as economically significant; an increase in the wage rate with one percent decreases the number of personnel in the child care sector with 1.4 percent and the number of personnel in the school sector with 1.3 percent. For care for the elderly, the effect seems to be economically important (with an elasticity of minus 0.9), even though the point estimate is imprecisely estimated. For administrative personnel, on the other hand, the wage rate seems to be an unimportant determinant; not only is it statistically insignificant, it also seems to be economically unimportant (with an elasticity of minus 0.1). These results are well in line with the predictions from the theoretical model.

Turning to the other explanatory variables, it is clear that dynamics and the size of a municipality are important determinants for the number of personnel in all sectors. The lagged dependent variable enters significantly and with a positive sign for all sectors, and the results for the density variable indicates

[17] The Sargan test is a test of the general model specification, but it is generally interpreted in the empirical literature as a test for instrument validity. The Sargan statistic is given by $N \times R^2$, where R^2 is the uncentered R^2 from the regression of the two-stage least squares residuals on the instruments and N the number of observations. The degrees of freedom are as many as there are overidentifying restrictions.

[18] In our case, the critical value at the 5 percent significance level is 5.99.

that there are economies of scale; the larger a municipality is, the smaller is the number of personnel per capita in all sectors.[19] [20]

Looking at the income variables, we reach the somewhat surprising conclusion that they do not seem to matter in the determination of municipal employment. Starting with the average taxable income in the municipality (the tax base), we get both statistically and economically insignificant results. Even more surprising is perhaps that grants seem to be so economically unimportant, with a point estimate of the elasticity that in all respects must be considered as zero, even thought it is statistically significant in two of the four cases. These results are however in line with the results obtained in Bergström *et al*. (2004).

Finally, the demographic structure in the municipality seems to be an important determinant, at least for child care and care for the elderly, and it seems to be reasonably signed; the more potential users there are, the higher is the number of personnel per capita (i e, the more children there is in the age 0-6 and the more persons there are in the age 80 and above, the more personnel per capita there is in the sectors for child care and care for the elderly). However, somewhat surprisingly, the number of children in the age 7-19 does not seem to affect the number of teachers per capita.

According to the theoretical specification of the demand equation, there are no cross-wage effects. It may nevertheless be an interesting question whether wage changes in the administrative sector affect the number of persons employed in other sectors: One hypothesis is that increased wage-costs for administrative staff leads to savings, and hence fewer employees, in the other sectors. Including cross-wage effects can therefore be seen as a test of the theoretical specification. From the cross-wage elasticities in *Table 2*, it is clear that wages for administrative personnel do not affect the demand for other types of labor. It can also be noted that the results for the other variables are unaffected by the inclusion of the administrative wage rate. These results hence support the use of a Cobb-Douglas utility function, since this specification lead to demand equations without cross-wage effects.

[19] Note that in a first-differenced specification, the density variable has the same interpretation as a population variable (since the number of square kilometres stays constant over time for all municipalities).

[20] We have also investigated whether the determinants of labor demand are different in larger municipalities (population larger than 50 000 or 100 000) by letting the impact of wages, grants and tax base differ for these municipalities. Our results, that are available upon request, indicate no such differences.

Table 1. Determinants of municipal employment in different sectors

	Administration	Child care	Care for elderly	Schooling
Lagged empl	0.6637	0.5624	1.0652	0.5870
	(0.1169)**	(0.0695)**	(0.1585)**	(0.1376)**
Wage (own)	-0.1346	-1.4010	-0.9141	-1.2830
	(0.4076)	(0.5431)**	(1.0444)	(0.3143)**
Grants	-0.0075	0.0175	-0.0373	0.0029
	(0.0086)	(0.0066)**	(0.0149)*	(0.0061)
Tax base	0.1092	0.1686	-0.0706	-0.0027
	(0.1266)	(0.1020)	(0.2083)	(0.0870)
Age 0-6	0.1487	0.1927	0.2350	0.0863
	(0.0923)	(0.0729)**	(0.1541)	(0.0632)
Age 7-15	-0.0171	0.1499	-0.2804	0.0493
	(0.1233)	(0.0956)	(0.2046)	(0.1005)
Age 16-19	-0.0804	0.0484	-0.1259	-0.0539
	(0.0553)	(0.0440)	(0.0909)	(0.0411)
Age 80	0.0090	0.1004	0.3418	0.0802
	(0.0771)	(0.0606)	(0.1234)**	(0.0575)
Density	-0.7934	-1.0351	-1.1823	-1.2666
	(0.1413)**	(0.1136)**	(0.2353)**	(0.1170)**
Constant	-0.0312	0.0923	-0.3531	0.1668
	(0.0463)	(0.0588)	(0.1073)**	(0.0456)**
Sargan	2.97	0.54	2.43	4.32

Notes: Wage (own) indicates that the wage variable is sector-specific in each regression. Lagged employment, wages, grants and tax base are in logarithms, so the parameter estimates are elasticities. Time dummies and municipality specific fixed effects are included in the estimations. Standard errors in parentheses. * (**) denotes significance at the 5 percent (1 percent) level. Lagged employment and own wage are instrumented. Employment lagged two and three years and wages lagged one and two years are used as instruments.

Table 2. Municipal labor demand; controlling for wages in administration

	Child care	Care for elderly	Schooling
Lagged employment	0.5561	1.0666	0.5817
	(0.0697)**	(0.1576)**	(0.1373)**
Wage (own)	-1.3851	-1.0482	-1.2713
	(0.5476)*	(1.0740)	(0.3181)**
Wage (administration)	-0.1267	0.3201	0.0448
	(0.0828)	(0.1947)	(0.0704)
Grants	0.0173	-0.0370	0.0030
	(0.0066)**	(0.0148)*	(0.0061)
Tax base	0.1764	-0.0854	-0.0055
	(0.1010)	(0.2075)	(0.0868)
Age 0-6	0.1991	0.2256	0.0842
	(0.0732)**	(0.1531)	(0.0630)
Age 7-15	0.1561	-0.2925	0.0492
	(0.0951)	(0.2047)	(0.1010)
Age 16-19	0.0491	-0.1281	-0.0537
	(0.0438)	(0.0910)	(0.0410)
Age 80	0.1052	0.3276	0.0770
	(0.0603)	(0.1232)**	(0.0568)
Density	-1.0277	-1.1920	-1.2661
	(0.1137)**	(0.2353)**	(0.1172)**
Constant	0.1028	-0.3718	0.1608
	(0.0553)	(0.1029)**	(0.0431)**
Sargan	0.54	2.16	4.32

Notes: Wage (own) indicates that the wage variable is sector-specific in each regression. Lagged employment, wages, grants and tax base are in logarithms, so the parameter estimates are elasticities. Time dummies and municipality specific fixed effects are included in the estimations. Standard errors in parentheses. * (**) denotes significance at the 5 percent (1 percent) level. Lagged employment and own wage are instrumented. Employment lagged two and three years and wages lagged one and two years are used as instruments.

5.2 Controlling for political strength

We have in this paper implicitly assumed that the level of public employment is set through a bargaining process between politicians and bureaucrats. One component that ought to be important for the employment outcome is therefore the relative bargaining strength of the two groups. Evidence in Kalseth & Rattsø (1998) supports this view. In this section, we will therefore examine whether relative bargaining strength matters.

One factor that might affect bargaining strength is experience. Politicians are elected every third or fourth year whereas the pool of bureaucrats remains more or less the same over time. Given that there is a change of power in connection with an election, new politicians enter the scene and must negotiate with experienced bureaucrats. This means that bureaucrats might have larger bargaining power in municipalities where there has been a change in power in the last election. In order to empirically investigate this, we divide the sample into municipalities that have "new-at-office politicians" and municipalities that have "re-elected politicians" and estimate the model separately for the two groups. The results are given in the first two columns of *Table 3*. In addition, we estimate a model where we allow the wage-parameter to be different for the two groups by interacting the bureaucrats' wage variable with a dummy variable that, after each election, takes the value one if the municipality got "new-at-office politicians", zero otherwise.[21] These results are given in the last column of *Table 3*. As is clear from the results, there is no significant effect from being new at office. That is, bureaucrats do not seem to be more powerful in negotiations with politicians that are new at office compared to the case when they meet more experienced politicians (in the sense that the politicians was re-elected in the last election).

In addition to the measure of bargaining strength used above, we also examine three other measures of the politicians' strength. First, we calculate the distance between the vote-shares of the two political blocs in the last election. If the distance is large, i e the election was not tight, we assume that the politicians are strong. Second, we compute the Herfindahl index which is inversely

[21] In our theoretical model we argue that the main difference between administrative staff and politicians/voters is the way wages for administrative personnel enters the demand equations. It is therefore natural to assume that wages will have different impact depending on the bargaining strength of the politicians; the stronger the politicians are, the less influence do bureaucrats have, and the more negative will the wage elasticity be.

related to party fragmentation; the higher the index is, the less fragmented is the party structure in the municipal council and the stronger do we assume that politicians are.[22] Finally, we have looked at how many times the political power has changed during the period 1974–2002. The fewer turnovers there have been, the stronger are the politicians assumed to be.[23] In what way shall these power-measures enter the demand equation? In Kalseth & Rattsø (1998) it is assumed that political strength affects the level of administrative spending; the stronger the politicians are the smaller is spending on administration. Following them, we have first let the distance variable and the Herfindahl index enter directly as own regressors in the estimations.[24] These results are presented in the first two columns in *Table 4*. Second, arguing in the same line as for the "new-at-office" case, we have interacted these measures of political strength with the wage variable. Results are given in *Table 4*. We see from the table that nothing happens when controlling for political strength; both the intercepts (the first two columns), and the interaction parameters (the last three columns) are statistically insignificant. The other parameter estimates do not change.

[22] The Herfindahl index is given by $\sum_p \left(\frac{seats_p}{\#seats} \right)^2$. If one party holds all the seats, the index takes the value 1 and if the seats are equally distributed between P parties, the index takes the value $1/P$. The Herfindahl index is used as a measure of political strength by, e g, Kalseth & Rattsø (1998).

[23] However, it could also be the case that politicians that are secure in their position (had a strong majority in the last election or have not experienced any turnovers in the past) do not need to bother as much about the implemented policy in order to satisfy the voters.

[24] Since turnover is constant over time, we cannot separate the effect from this variable from the fixed effects.

Table 3. Demand for administrative personnel; controlling for whether the politicians are new at office

	"New-at-office"	"Re-elected"	Full sample
Lag	0.6135**	0.7080**	0.6617**
	(0.1997)	(0.1504)	(0.1186)
Wage (adm)	-0.3827	-0.1559	-0.1617
	(0.6587)	(0.5110)	(0.4130)
Wage*new-at-office			0.0057
			(0.0039)
Grants	- 0.0019	-0.0114	-0.0078
	(0.0135)	(0.0113)	(0.0087)
Tax base	0.0594	0.1319	0.1144
	(0.2210)	(0.1623)	(0.1281)
Age 0-6	0.1915	0.1433	0.1557
	(0.1459)	(0.1202)	(0.0936)
Age 7-15	0.2002	-0.1191	0.0049
	(0.2003)	(0.1582)	(0.1252)
Age 16-19	-0.0475	-0.1072	-0.0860
	(0.0865)	(0.0731)	(0.0562)
Age 80	0.2188	-0.0828	0.0111
	(0.1402)	(0.0962)	(0.0780)
Density	-0.7894**	-0.8443**	-0.8254**
	(0.2625)	(0.1799)	(0.1448)
Constant	-0.0587	-0.0419	-0.0404
	(0.0603)	(0.0480)	(0.0383)
Sargan	0.3796	3.8566	4.053

Notes: Lagged employment, wages, grants and tax base are in logarithms, so the parameter estimates are elasticities. Time dummies and municipality specific fixed effects are included in the estimations. Standard errors in parentheses. * (**) denotes significance at the 5 percent (1 percent) level. Lagged employment and own wage are instrumented. Employment lagged two and three years and wages lagged one and two years are used as instruments.

Table 4. Demand for administrative personnel; controlling for the political strength of the politicians

	Distance	Herfindahl	Distance	Herfindahl	Turnover
Lag	0.6618	0.6641	0.6630	0.6632	0.6588
	(0.1166)**	(0.1169)**	(0.1167)**	(0.1169)**	(0.1170)**
Pol strength	-0.0002	0.0332			
	(0.0003)	(0.0865)			
Wage (adm.)	-0.1249	-0.1358	-0.1777	-0.1363	-0.1465
	(0.4081)	(0.4078)	(0.4133)	(0.4071)	(0.4056)
Wage*strength			-0.0050	0.0017	-0.0132
			(0.0069)	(0.0630)	(0.0613)
Grants	-0.0074	-0.0074	-0.0071	-0.0075	-0.0075
	(0.0086)	(0.0086)	(0.0086)	(0.0086)	(0.0086)
Tax base	0.1121	0.1086	0.1123	0.1078	0.1125
	(0.1266)	(0.1267)	(0.1268)	(0.1268)	(0.1270)
Age 0-6	0.1505	0.1478	0.1457	0.1491	0.1479
	(0.0923)	(0.0924)	(0.0922)	(0.0924)	(0.0921)
Age 7-15	-0.0154	-0.0176	-0.0158	-0.0184	-0.0162
	(0.1232)	(0.1234)	(0.1234)	(0.1235)	(0.1233)
Age 16-19	-0.0804	-0.0812	-0.0829	-0.0794	-0.0803
	(0.0553)	(0.0554)	(0.0555)	(0.0555)	(0.0554)
Age 80	0.0082	0.0095	0.0120	0.0099	0.0090
	(0.0770)	(0.0771)	(0.0773)	(0.0772)	(0.0769)
Density	-0.7969	-0.7938	-0.7855	-0.7927	-0.7946
	(0.1414)**	(0.1413)**	(0.1418)**	(0.1413)**	(0.1416)**
Constant	-0.0328	-0.0310	-0.0265	-0.0308	-0.0297
	(0.0464)	(0.0463)	(0.0469)	(0.0463)	(0.0461)
Sargan	2.702	2.9722	2.9722	6.4848	4.053

Notes: Strong politicians are assumed when Distance > 0.18, Herfindahl > 0.28 and Turnover < 2. Lagged employment, wages, grants and tax base are in logarithms, so the parameter estimates are elasticities. Time dummies and municipality specific fixed effects are included in the estimations. Standard errors in parentheses. * (**) denotes

significance at the 5 percent (1 percent) level. Lagged employment and own wage are instrumented. Employment lagged two and three years and wages lagged one and two years are used as instruments.

6 Summary and concluding remarks

In this paper we have argued that bureaucrats in the government sector have a double role since they are both suppliers and demanders of public employment. A theoretical model has been presented focusing on this aspect. The theoretical model provides the predictions that an increase in the municipal wage rate in any sector will lead to a decrease in the number of personnel in that sector. This is however not the case for the bureaucrats. The theoretical prediction of the wage effect for this sector is that the sign is ambiguous; it can have a positive effect, a negative effect or no effect at all. The reason for this is that bureaucrats, which have an important say in designing the policy, do not have the same incentives to react to higher wages by cutting employments, since these wages corresponds to their own income. It is worth noticing that the mechanism we describe in this paper may well be relevant for private sector employment as well; also in the private sector there exists administrative personnel that can be assumed to bargain with business leader representing the shareholders over the firm's labor demand.

Using panel data for Swedish municipalities over the period 1990–2002 we have estimated municipal labor demand functions for administration, child care, care for the elderly and schooling. It turns out that the predictions from the theoretical model are supported by the empirical analysis; the wage rate has a significant (in a statistical and/or economical sense) and negative effect in all sectors but the administrative one. For the administrative sector, the wage rate seems to have no effect, neither in a statistical nor in an economical sense. This result could of course also turn up if the bureaucrats have no power and the politicians' demand for bureaucrats is inelastic. We do however not think that this scenario is very likely; our interpretation of the results is, along the lines of the theoretical model, that the bureaucrats' role in the local government's decision making process affects the demand function for administrative personnel.

Other empirical results that might be worth highlighting are the negligible effects that increases in intergovernmental grants and average income in the municipalities have on municipal employment; they seem to be unimportant in both a statistical and an economical sense. The results for grants are well in line

with the results in Bergström *et al* (2004). Further research is needed in order to understand why income seems to be so unimportant for municipal labor demand.

Given that municipal labor demand is decided over in a bargaining game between politicians and bureaucrats, the groups' respective bargaining strength ought to be important. One way to capture this is through the politicians' political strength. Examining this, it turns out that different measures of political strength do not seem to be of any importance. Maybe a more thorough modeling of the bargaining game is needed in order to correctly specify political strength and its impact. This is a task for future work.

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Appendix

The data-set is obtained from Statistics Sweden and the Swedish Association of Local Authorities, and consists of a panel of Swedish municipalities over the years 1990–2002. Out of the existing 290 municipalities 14 were discarded for the following reasons:

i) Newly created/split municipalities: 140, 181, 330 480, 461, 488, 1583, 1535, 1880 and 1814
ii) Outlier: 382
iii) Municipalities that handle tasks not normally handled by municipalities: 980, 1280 and 1480.

Table A1. Summary statistics

Variable	Mean	St dev	Min	Max
Employment, administration	5.32	1.01	2.21	12.71
Employment, child care	11.38	2.25	3.67	24.11
Employment, care for elderly	18.12	6.79	2.90	38.60
Employment, schooling	14.87	4.33	0.64	31.29
Wages, administration	15 988	3 191.5	10 150	26 139
Wages, child care	12 837	2 411.8	8 366.9	18 778
Wages, care for elderly	12 577	2 307.4	8 611.9	19 357
Wages, schooling	16 333	3 020.4	8 820.2	23 302
Grants	7 828.5	3 554.4	-11 675	23 194
Tax base	828.39	215.13	374.50	2 349.9
Age0-6	8.72	1.26	4.74	13.05
Age7-15	11.61	1.29	6.46	16.43
Age16-19	5.04	0.60	2.81	8.92
Age80+	5.01	1.35	1.04	8.89
Density	114.33	389.19	0.26	4 006.3

Note: For definitions, see the following page

Definitions of variables:

Municipal employment: Number of full-time equivalences per 1000 inhabitants (people employed on hourly bases are excluded). In 1998 there was a change in the definition of full-time equivalences. This variable is available for administration, school and leisure, child care and care for elderly separately.

Wages: Total sum of wages paid in the municipality divided with number of full time equivalences (people employed on hourly bases are excluded). This variable is available for administration, school and leisure, child care and care for elderly separately.

Grants: Intergovernmental grants from the central government to the municipality per inhabitant.

Tax base: Municipal tax base, 100 SEK per inhabitant. Measured in January 1st

Age0-6: Percent of the population younger than 6, in January 1st.

Age7-15: Percent of the population older than 6 but younger than 16, in January 1st.

Age16-19: Percent of the population older than 15 but younger than 19, in January 1st.

Age80+: Percent of the population older than 80, in January 1st.

Density: Inhabitants per square kilometer, in January 1st.

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