Do Local Public Expenditures on Functionally Impaired Crowd Out Other Local Public Expenditures?

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Abstract

This paper examines whether local public expenditures on services to functionally impaired individuals crowd out other local public expenditures in Sweden. Over the last ten years, these expenditures have increased by more than 90 percent while other municipal expenditures have experienced increases of up to 30 percent. The impact of expenditures on functionally impaired individuals is tested on five different spending areas using a two-stage least squares (2SLS) fixed-effects model. While the results give no support for crowding out in the areas of social assistance, culture & leisure, and childcare & preschool, a negative relationship on spending for elderly & disabled care and education is found, suggesting that crowding out indeed occurs within the municipal sector. The negative relationships are significant both in a statistical and an economic sense.

Keywords: Local public expenditures, Functionally impaired, Expenditure crowding out
JEL classification: H72, J14, R50

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1. Introduction

This paper examines whether local public expenditures on one particular service tend to crowd out other local public expenditures. The specific service studied here, services to functionally impaired individuals, became the responsibility of the municipalities via a reform in 1994. At the same time, a new law imposed by the national government was implemented. The law, called the LSS-act[1], is an entitlement law geared towards individuals with functional impairments.[2] Since the reform and the implementation of the LSS-act, there has been a considerable increase in the expenditures on services to functionally impaired individuals. Reforms and decentralization of public activities are meant to increase efficiency and accountability to the local government. This is one of the main theoretical arguments for decentralizing public activities; the local governments are in a better position to provide basic services because they are better informed about individual demands than the national government (Oates, 1972). When a national government imposes new services and responsibility on the local governments, appropriate funding is not always provided. If not, this could also affect other areas of the local government. With new responsibilities and with a limited budget, the local government must prioritize its public service provision in other ways than previously. In such cases, expenditures on one type of service could crowd out expenditures on other services; thereby affecting the level of services provided in the other areas. Naturally, this could happen without new regulations or decentralization – for example, expenditures on health care continue to increase throughout the world, which puts a burden on government budget and spending allocation. Similarly, the elderly population is growing larger, which also puts a burden on government budgets.

It is important to study what are the effects of reforms and new services on how expenditures are determined within the local government. First, it is important in order to identify the area(s) within the local governments that are affected by new national government policies, such as decentralization or reforms of public service provision, especially areas that may not be directly associated with the reform or policy. Second, if some categories of public service provision are strongly regulated, will this cause expenditure in other areas to be crowded out? That is, are certain categories of spending more prone to expenditure crowding out than others? It would be important to identify these areas when implementing reforms or nationally imposed services.

[1] LSS-act = Act on Support and Services for Certain Disabled Persons, LSS 1993:387.

[2] Throughout this paper, the terms "services for functional impaired" and "LSS services" are used interchangeably. Similarly, "LSS expenditures" and "expenditure on services to functionally impaired" are also used interchangeably.

Empirical research on public expenditure is usually based on the seminal work of Borcherding and Deacon (1972) and Bergstrom and Goodman (1973), where the demand for local public services is regarded as a function of the characteristics of the median voter. The expenditure problem for the local government is then treated in a similar way as consumer choices in the private sector. In empirical applications, determinants also include economic, demographic and geographical characteristics of the local government, for example tax base, population size, age structure, intergovernmental grants, as well as other institutional and socio-economic factors. This work was later extended by Deacon (1978) to include the composition of public expenditure. Local expenditures (and services) can also be related to other tiers of the government. Aronsson, Lundberg and Wikström (2000) show that local public expenditure is not only explained by local government characteristics but could also be explained by the service provision/expenditures of the regional level government; the expenditure decisions at different levels are interdependent. These studies, among others, show that an expenditure decision in one area affects expenditure decisions in other areas, either within the local government or among different tiers of governments.

Previous studies dealing with expenditure crowding out have found no or only limited support for the crowding out hypothesis. For example, Fossett and Wyckoff (1996) studied the impact on spending on public education of increasing spending on Medicaid. Their results show no significant effect on educational expenditures. Instead, their findings indicate that changes in educational spending respond to changes in the states' own-source revenue rather than increases in Medicaid spending. McCarty and Schmidt (1997) use a vector autoregressive framework to study whether interaction in expenditures from six government spending categories shows any evidence of crowding out; they find no support for the crowding out hypothesis. Rather, increases in spending in one category are paid for by increases in tax revenue rather than being due to crowding out of other expenditures. Finally, the most recent study (to my knowledge), Landon, McMillan, Muralidharan and Parsons (2006), uses a panel of Canadian data and examines whether health care spending crowds out other provisional government spending and, as in the previous studies, it finds no support for the crowding out hypothesis.[3]

[3] See also the studies of Brazer and McCarty (1986) and Marlow and Shiers (1999); the first is a study of the "municipal overburden" hypothesis and the second concerns the effect of law enforcement spending on education spending. Neither of the studies finds support for expenditure crowding out.

The hypothesis to be investigated in this paper is whether increased expenditures – due to a nationally imposed reform – in one area affect other expenditure areas within the local government. More specifically, does the expenditure on services to functionally impaired individuals crowd out other municipal expenditures? Although the local government has the autonomy to set its own local tax rates, the income from taxes does not fully cover the municipal service provision.[4] Moreover, the excess burden of an increase in the tax rate is greater with higher tax rates; therefore, it could be very costly if municipalities would further increase the local tax rate (since the tax rates already are high in Sweden). This is why municipalities are reluctant to increase the tax rates. Consequently, when an area within the local government experiences high increases in expenditures, other areas are likely to be affected. In that sense, this study differs from previous studies on expenditure crowding out.

The crowding out hypothesis will be tested on five spending categories of the municipalities: elderly & disabled care; education; social assistance, childcare & preschool; and culture & leisure. These five categories make up the majority of municipal spending (about 90 percent); where the total expenditures of the municipalities in Sweden amounted to 423 billion SEK in 2007. The responsibility to perform care and services for individuals with functional impairment became the responsibility of the municipalities (transferred from the county councils) via a reform in 1994. Ever since this reform, there has been a significant increase in the expenditures for services to functionally impaired, and the burden of the rise in the expenditure has had a considerable effect on municipalities. Over the last ten years, the expenditures for functionally impaired have increased by more than 90 percent while other municipal expenditures have experienced increases of between 15 and 30 percent. However, this does not constitute any evidence of expenditure crowding out; it could just reflect other reasons for why there has been an increase in this expenditure. To support the crowding out hypothesis, increases in expenditure for functionally impaired must have negative effects on other expenditures in such a way that this cannot be explained by other factors determining the expenditures.

Following earlier literature on expenditure crowding out, this paper aims at empirically examining the crowding out hypothesis on Swedish municipal expenditure data. The contribution of this paper is twofold; first, it adds to the literature on local public expenditure by analyzing the effect of a nationally imposed reform on local public expenditures in Sweden. Second, the increased

[4] Income from taxes covered about 68 percent of the municipal service provision in 2007. Source: Swedish Association of Local Authorities and Regions (SALAR).

demand for publicly provided services (due to the growing share of elderly and increasing health care expenditures, for example) increases the pressure on the public service budget. So, this topic is indeed important with regards to expenditures and public policy in Sweden. It could also be important in other countries experiencing an increased demand for public services.

The rest of the paper is organized as follows: Section 2 describes municipal characteristics and expenditure patterns in Sweden; Section 3 describes and discusses the hypotheses and the data. Section 4 describes and discusses the empirical specification and the method. Section 5 presents the empirical findings, while concluding remarks can be found in section 6.

2. Municipality Services and Expenditures

Sweden is divided into 290 municipalities and 21 counties. Municipalities are responsible for public activities such as social services, elderly care, education and infrastructure. The main task of the counties is to provide healthcare. There is no hierarchical relation between municipalities and counties since they are responsible for different activities.[5] Some of the municipality activities are regulated by law or have guidelines; while other municipality activities are provided for on a voluntary basis. For example, the municipalities are legally responsible for providing social services, elderly care, support for disabled, primary and secondary education, and water and sewerage. Although legally responsible, the municipalities have some flexibility to decide themselves how to perform their duties and distribute the resources. Leisure activities, cultural activities[6] and industrial and commercial services are examples of activities that the municipalities provide on a voluntary basis without any regulations.

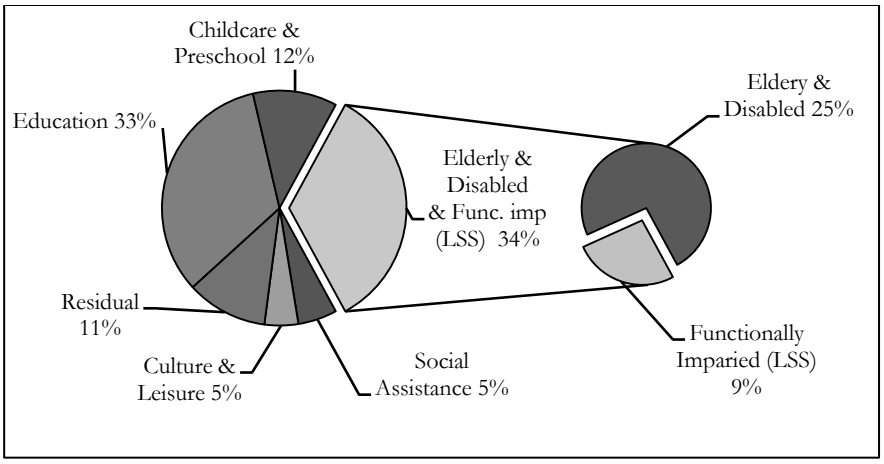
In Figure 1, the distribution of all municipal expenditures for the year 2004 is presented. The year is chosen to represent an average year within the time frame of the study. The municipal service expenditure is divided into six main categories: care and service for elderly & disabled and functionally impaired; education; childcare & preschool; social assistance; culture & leisure; and a residual category. The five first categories constitute 90 percent of the total spending of municipalities. The residual category consists of various expenditures grouped together (e.g.

[5] The only exception is Gotland, where the municipality also has the responsibilities normally associated with a county council.

[6] Except for the provision of libraries in the municipalities.

infrastructure, environmental protection, tourism), which makes up about ten percent of municipalities' total spending.

Figure 1. Average per Capita Municipal Spending in 2004



As can be seen in the figure, expenditures on education and expenditures on elderly & disabled and functionally impaired individuals are the two largest service areas within municipalities; each constitutes one third of the total spending of the municipalities.[7] The social service sector of the municipalities includes care and services for elderly & disabled and functionally impaired; but it also contains social assistance for individuals and families. The latter includes, for example, welfare assistance, help and services for children and young people, families, individuals abusing drugs or alcohol, and women who have been subjected to violence.[8]

Service and care for elderly & disabled includes accommodations for those in need of special support. For example, the municipalities must arrange housing for people who, for physical or mental reasons, encounter considerable difficulties in their daily lives and need special accommodation. Services to individuals with functional impairments are regulated in an

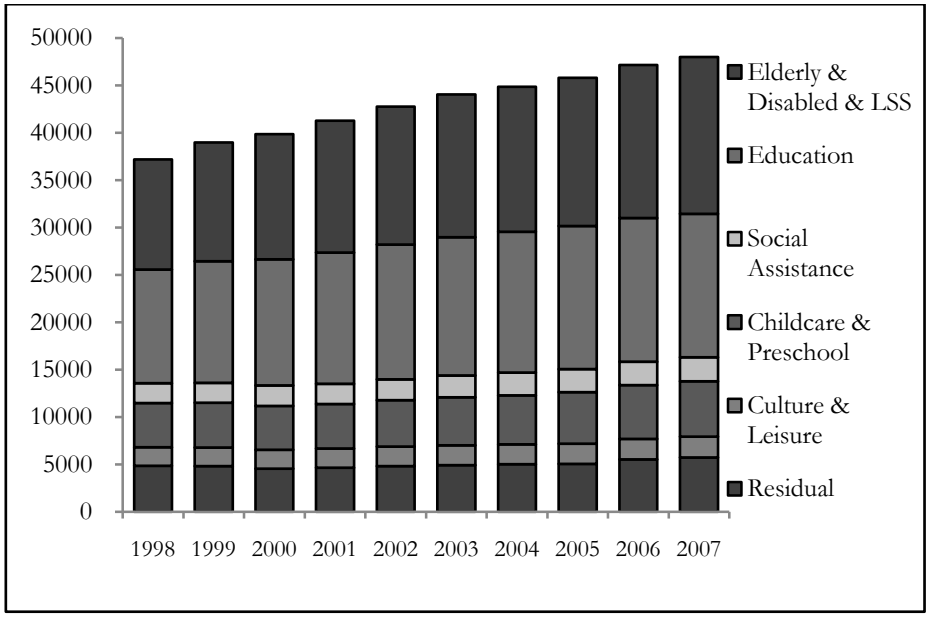
[7] Services to elderly & disabled and services to functionally impaired belong to the same overall service area; however, the municipal expenditure data differentiate between the two groups which makes it possible to study the effect of expenditure on services to functionally impaired individuals.

[8] The measures may be advice, financial aid, family law or family counseling. In special cases, certain measures can be implemented without the individual's consent. This applies to care of children and young people and care of adult drug and alcohol abusers.

entitlement law, the LSS-act. Included in the LSS-act are services such as personal assistance, special housing accommodation, contact persons and daily activities (National Board of Health and Welfare, NBHW).

The expenditure on services to functionally impaired amounts to almost one third of the total spending on elderly & disabled and functionally impaired. To put this into a context, about 0.6 percent of the Swedish population received services according to the LSS-act, while the number of potential users of elderly care (individuals aged above 75) amounted to about 8.7 percent; this can give us an idea of how expensive the LSS service provision is for the municipalities. As already mentioned, there has been a sharp increase in the expenditure on LSS over the years since it was first implemented.

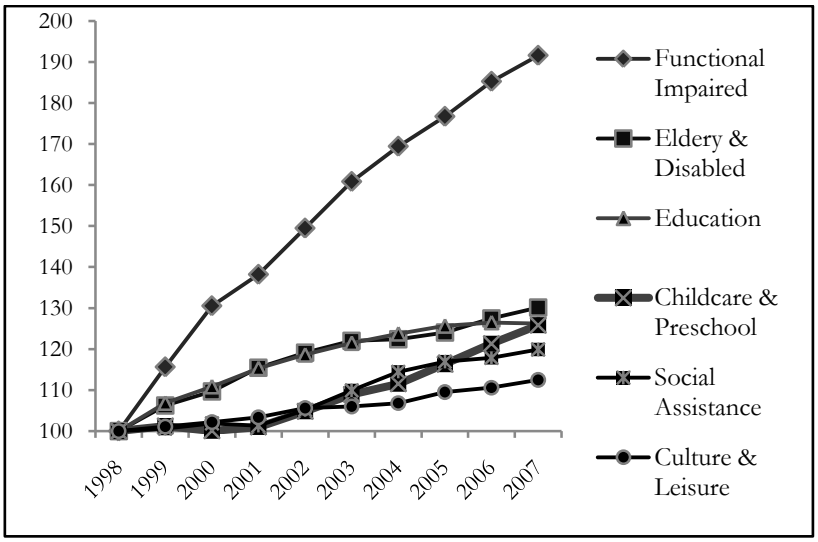
Figure 2. Average per Capita Municipal Spending in 1998-2007, SEK



In Figures 2 and 3, the municipal expenditure for each sector is presented (in real terms). While Figure 2 shows the composition of expenditures during 1998-2007, Figure 3 shows the development in expenditures as compared to the year 1998. LSS expenditure is separated from spending on the elderly & disabled for illustrative purposes, in order to see exactly how much more LSS expenditure has increased as compared to all other expenditure in the municipalities.

As is evident in the figures, not only does care for elderly & disabled and functionally impaired have the highest spending, it is also the area within the municipality experiencing the highest increase in its expenditure. While the expenditures for elderly & disabled care increased by 30 percent during the period 1998-2007, LSS expenditure increased by more than 90 percent.[9] As a reference, it can be mentioned that during the same period, there was an increase in the tax base of 32 percent.

Figure 3. Average Municipal Spending, Index 1998 = 100



Although it is evident that there has been a considerable increase in spending on LSS services and they are taking a larger share of the municipal budget, this could just be the result of spending readjustments, reflecting changes in demand for different public services. Since both the expenditure for the elderly & disabled and expenditure for the functionally impaired have increased, this may just reflect that there has been an increase in the elderly population. Therefore, to support the crowding out hypothesis, the distribution of expenditures must be such that the areas on which there is a negative impact of LSS expenditure would have received more resources and a higher level of spending had it not been for the potential burden of the LSS expenditure.

[9] In real terms: all prices in this paper are adjusted to 2007 year prices.

3. Hypothesis and Data

The crowding out hypothesis will be tested on five broad spending areas: spending on elderly & disabled care; education; childcare & preschool; social assistance; and culture & leisure. This section starts out with a discussion of the crowding out hypothesis, and why increased expenditures on services to functionally impaired could affect each of the five spending areas. The section ends with a presentation of the data.

Crowding out hypothesis

The hypothesis to be tested in this paper is if expenditures on services to functionally impaired crowd out other municipality spending. When the local government is faced with increasing expenditure in one area, due to a national reform, decentralization of public services, new laws, or just an increasing share of demand for some services, the municipality must redistribute the given resources within their set budget. The municipal budget is limited in the sense that the municipality's own source of income, taxes, does not fully cover the municipal service provision.[10] And although the local governments in Sweden have the autonomy to set their own local tax rates, the excess burden of an increase in the tax rate could be very high for the municipalities, thus making it difficult to motivate further tax increases.[11] Therefore, with new areas of responsibilities and with a limited budget, the municipalities may be forced to redistribute their resources from one area to another.

When municipalities redistribute their resources, it is not likely that every area will be affected in the same way. One reason why the effect will not be the same is that the cost associated with decreasing resources is different in different areas. As discussed in the previous section, most of the municipalities' duties are regulated by law or there are guidelines; therefore, if a service is strictly regulated, the cost of not providing the service could be very high. First, not providing the service could lead to lawsuits and fines. Second, deviating from a given norm could also be costly; this would send a negative signal to both voters (perhaps not to reelect the politicians) and potential individuals moving to this municipality. Individuals have preferences on what they want their local governments to provide, such as level of education and recreational services.

[10] Municipal income also consists of governmental grants, tax equalization, and fees.

[11] Moreover, different measures for restricting the municipalities in increasing their own tax rate have been in place during the 1990's. During 1991-1993, it was prohibited to increase the tax rate. In 1994, municipalities that did not increase their tax rate received economic compensation. During 1997-1999, municipalities that increased the tax rate received less governmental grants (Halápi, 2008).

Individuals choose to migrate and live in areas whose local government best satisfy their preferences. This argument was originally presented by Tiebout (1956). In a migration study on Swedish data, Dahlberg, Eklöf, Fredriksson and Jofre-Monseny (2008) examine the impact of local public services on migration behavior. They find that given taxes, high spending on child care and "other" expenditures (i.e. culture, parks and recreations, welfare assistance, and administration) attract migrants, while they do not find any conclusive result on elderly care and education.

The size of a service area is another reason that determines if an area will be affected by the increased expenditure. It may be less noticeable to decrease resources in a large service area than in a small area. The marginal disutility of a decrease in total expenditure in a large area is likely to be less than in smaller area. Therefore, it is likely that the resource allocation (and/or crowding out) would be from a larger area where it may be easier to decrease spending without greatly affecting the service provision. A third reason why different areas can be differently affected is that expenditure decisions within the local government or between different tiers of governments (for example, local and regional level) are interdependent (Aronsson et al*.,* 2000).[12] When there is an issue of non-separability between two publicly provided services, they can either be substitutes or compliments to each other. If the services are substitutes, an increase in the expenditure in one area will then decrease the expenditure in the other area, via reduced demand. On the other hand, if the services are complementary, then increased demand for one service will also increase the demand for the other service, thus increasing the expenditure in both areas.

Elderly & disabled

There are at least three reasons why the first spending area – elderly & disabled – may be crowded out by LSS expenditure. First, services to elderly & disabled belong to the same service area as services to the functionally impaired; and people eligible for services according to the LSS-act may have had services covered by the elderly & disabled area, but are now instead receiving services according to the LSS-act. In such cases, the services to functionally impaired individuals may be viewed as a substitute for the care to elderly & disabled. Second, the care for

[12]Aronsson et al. (2000) study if county (regional) expenditures affect municipal (local) expenditures. In their model, county expenditure can affect municipal expenditures via a tax base effect (using the same source of revenue) and a direct effect (in the cases where the expenditures at the county level and the municipal level are non-separable). Their result suggests a positive correlation between county and municipal expenditures. This implies that municipal and county expenditures are complements in the utility function and/or that county expenditures and private consumption are substitutes.

elderly & disabled is regulated by the Social Service Act (SoL 2001:453), which is a law, but not as strong as the LSS-act. Third, the elderly & disabled area is the largest sector of the municipalities. For these reasons, some resources from the elderly & disabled service area are likely to be allocated to services to functionally impaired.

Education

For the second spending area, education, LSS expenditure may also crowd out spending. Education is the second largest sector of the municipal service provision, and although this is an area that affects a group of individuals having strong preferences for school quality, education may still be an area affected by the high LSS expenditures. Since this is a large spending area, it may not be very noticeable when there are decreases in total expenditure for education. Therefore, it is likely that the education sector is affected when resources are to be redistributed within the municipality.

Social assistance

The third spending area, social assistance, is part of the same large social sector as elderly & disabled and functionally impaired. Therefore, if the LSS service area requires more resources, some of the resources may be redistributed from social assistance. On the other hand, social assistance is regulated in the Social Service Act and there is a strict lower limit on the level of welfare and assistance. Therefore, it may not be possible for municipalities to crowd out social assistance resources. In addition, social assistance represents a minor part of the budget; it may be difficult to decrease the resources without greatly affecting the provision.

Childcare & preschool

Childcare & preschool may or may not be affected by the LSS expenditure; the spending does not constitute a large share of the total municipal budget. Similar to the education area, childcare & preschool is also an area where there might be strong preferences in the community for a high quality of services. However, contrary to the education area though, childcare & preschool only constitute a smaller share of the total municipal budget, therefore, it may be more difficult to redistribute resources without affecting the quality of this services too much.

Culture & leisure

The last spending area, culture & leisure, is the only area in which provision is unregulated. If municipalities are short of resources, they could use money allocated to culture & leisure, since there is no law regulating this provision. However, the budget share for culture and leisure is rather modest, and municipalities may not want to decrease this level in order to allocate resources to other areas. Culture & leisure is an area that is highly visible in a municipality, besides being an area that many people care about; therefore, municipalities may be reluctant to decrease spending here. If spending on culture & leisure were to decrease, it may send a signal to the inhabitants about the performance of the municipality, which may not be viewed as favorable. Furthermore, for those inhabitants with strong preference for culture & leisure, with a decrease in the spending area they may choose to migrate to other regions providing culture & leisure that better satisfy their preference instead.

Data and descriptive statistics

The data set consists of 288 municipalities over the time period 1998-2007. The public expenditure variables are expressed as expenditure per capita, measured in Swedish kronor (SEK). All monetary variables are adjusted to the 2007 year price level using the consumer price index, CPI.

To make comparisons of the impact of LSS expenditures, the dependent variable is defined in the same way for all five categories. The explanatory variables include municipality-level variables in order to control for differences in basic economic conditions among the municipalities. The explanatory variables included in the study are standard in studies of local public expenditure, i.e. tax base, intergovernmental grants[13] and long-term debt. The percent of unemployed and the share of the population on welfare benefits are also included, as are the population shares of different age groups. The local budget for a particular year is decided in November the previous year and thus, all municipal characteristics' are lagged one time period, since this is the information that contains economic and demographic conditions for the previous years. For the elderly & disabled spending equation, two additional explanatory variables are included. These two variables are included to capture the difference in cost for the services and care (it is

[13] The grant variable is defined as the total sum of grants, per capita. The composition of grants to the municipalities changed during the time period studied. Until 2004, the grants consisted of general grants and intramunicipal equalization. From 2005, the general grant is part of the income equalization grant/fee.

significantly more costly to provide special residence for elderly, than to provide care and service to elderly in their own home). Descriptive statistics for all variables are presented in Table 1, and variable definition and data sources for the variables are presented in Table A1 in the Appendix.

Table 1. Descriptive Statistics 1999-2007

	1999-2007				1999	2007
Variable	Mean	Std. Dev	Min	Max	Mean	Mean
Dependent variable						
Elderly & Disabled care spending	10696	3023	2723	24599	9462	11650
Childcare & Preschool spending	5121	1032	2855	9730	4714	5847
Education spending	14336	1727	7682	21924	12832	15144
Social Assistance spending	2310	805	559	5880	2118	2521
Culture & Leisure spending	2081	533	537	4944	1977	2200
Explanatory variables						
Expenditures for services for functionally impaired (LSS)	3725	1334	223	9658	2730	4538
Home service (Elderly care) percent	8.3	2.4	0	30	7.8	11.9
Special residence (Elderly care) percent	7.1	1.8	1.4	14.9	7.9	5.9
Municipal and Socioeconomic explanatory variables 1998-2006						
Tax base	124229	19717	83755	267155	108089	141718
Grants	8524	4891	-16399	24700	9054	7808
Debt (long-term)	11103	11166	0	78252	9743	11450
Population, log	4.3	0.4	3.4	5.9	4.3	4.3
Welfare, percent	4.5	1.9	0	15.8	6.3	3.8
Unemployment, percent	3.9	1.4	0.9	11	4.9	3.4
Population age 0-6, percent	7.3	1.1	4.7	11.8	8.1	7.2
Population age 7-15, percent	12.2	1.2	6.5	16.4	12.2	11.2
Population age 75+, percent	9.7	2.2	2.8	16	9.5	9.9
Instruments for LSS expenditure						
LSS Daily Activity, percent	44.7	12	0	100	44.7	46.6
LSS Adult Residential home, percent	35.1	12	0	72	35.6	35.4
LSS individuals per 10000 inhabitants	59.1	18	10	160	52.6	64.4

Note: All monetary units are measured in *Swedish kronor* (SEK) and adjusted to the 2007 price level using CPI. Each dependent variable as well as the LSS expenditure is measured in per capita terms. The variables tax base, grants, and debt are also measured in per capita terms.

As will be discussed section IV, to account for simultaneity and endogeneity when testing the hypothesis of LSS expenditure crowding out other municipal spending, instrumental variables are needed that directly affect LSS expenditure but not expenditure for the dependent variable(s). The instruments that will be used are the three most important determining factors for LSS expenditure. The three instruments are: the number of individuals in a municipality that receive LSS services (per 10000 inhabitants), the share of individuals receiving LSS services that lives in

"adult residential homes" (the most expensive service), and the share of individuals receiving LSS services that gets the service "daily activity" (the most common service). The properties of the instruments will also be discussed in section IV.

Merged data and missing observations

Today, Sweden consists of 290 municipalities; however, during the time period studied in this paper, two municipalities have seceded (Nykvarn in 1999 and Knivsta in 2003) from two other municipalities. In order not to lose observations or geographical data, the seceded municipalities have been merged back with their respective "original" municipalities in this study. Expenditure data are missing for a few observations (approximately 20 observations out of a total of 17280 observations). In lieu of the missing values, I have used the mean of the previous and following year; i.e. when the missing value was for the year 1998, I used the value for 1999. The result of the estimation is unaffected whether I include or exclude these observations. Due to the sensitive nature of the LSS data, values for municipalities that only have one, two, or three individuals with a particular LSS service are not available. Therefore, the value *two* is used in lieu of the non-available data. For a detailed description of LSS services and expenditure, see Birkelöf (2008).

4. Empirical specification and method

A standard empirical model for determining government expenditure is usually expressed in a linear specification. Following this approach, a fixed-effects model of municipal spending that accounts for time and municipal individual effects can be estimated by the equation[14]:

$$C_{it}^{EXP} = \beta_1 X_{it-1}^{SocMun} + \beta_2 L_{\text{it}}^{\text{EXP}} + year + municipal + \varepsilon_{it} \qquad (1)$$

$$\text{where} \quad L^{\text{EXP}} = f(L^{IND}, L^{HOME}, L^{DAY})$$

where:

C_{it}^{EXP} is per capita spending for the five spending categories

X_{it-1}^{SocMun} is a vector of socioeconomic and municipal characteristics[15]

L_{it}^{EXP} is per capita expenditure for services to functionally impaired

$L^{IND}, L^{HOME}, L^{DAY}$ are variables determining the LSS expenditure.

[14] The results are robust to the choice between a linear and a log-linear empirical model: a logarithm version of the equation yields the same sign and significance of the coefficients.

[15] Additional explanatory variables for elderly care are included for the spending category "Elderly & disabled care spending" (the variables are measured at time *t* for municipality *i*).

The inclusion of L in equation (1) allows LSS spending to have a direct impact on expenditures for the spending category studied, while holding other factors determining that category constant, as would be suggested by the crowding out hypothesis. However, since all five categories studied here are services provided by the municipalities, the resources are allocated from the same overall budget. That is, the expenditure for some or all of the spending categories may be simultaneously decided with the expenditure for LSS. In such a case, LSS spending is endogenous and it is correlated with the error term in equation (1). When a right-hand side variable is correlated with the error term, it implies that using OLS yields biased and inconsistent estimates (Baltagi, 2002; Green, 2003). If the LSS expenditure is endogenous in the expenditure equation(s), the OLS will underestimate the impact of LSS expenditure (in absolute terms); i.e. the estimated effect will be too modest. Therefore, to correct for the simultaneity bias in the equation, the endogenous variable, LSS expenditure, must be replaced with variables that are highly correlated with the LSS expenditure but not correlated with the error term in equation (1).

One way of correcting for the simultaneity bias is to use instrumental variables for the endogenous explanatory variable and then using the two-stage-least-squares (2SLS) estimation method. The instruments used in this study are the three most important determining factors for LSS expenditure; the number of individuals with LSS services and two of the services provided. The LSS variables are argued to be exogenous to the spending category studied, for example, spending on elderly & disabled. However, one might ask why LSS expenditure is endogenous, while factors determining LSS expenditures are exogenous? This is due to the characteristics of the LSS service provision: the LSS services are governed by a strict entitlement law and to be granted LSS services, the functional impairment must be "severe and permanent". A person granted LSS service(s) in one municipality is not necessarily granted the same service(s) if moving to another municipality; therefore, migrating to another municipality is not common among those granted LSS services.[16] Furthermore, individuals receiving LSS services one year are most likely receiving them the next year as well, so the number of individuals can be seen as exogenous with regard to other municipal services. Rather than decreasing the number of individuals who are granted LSS services, the resources for providing the LSS service may change (e.g. fewer personnel). If there is a change in the resources for providing LSS services, it is not exogenous to

[16] A person who has been granted LSS services and wants to move to another municipality must apply six months beforehand to the new municipality with regard to the level of service the new municipality will offer.

the other spending category. So while the *LSS expenditure* may be correlated with other spending categories, the number of *individuals receiving LSS services* should not be correlated with spending and it can therefore be used as an instrument. Both two-stage-least-squares (2SLS) and OLS will be used to estimate the equations, and the results from these will be presented in next section.

If an increase in LSS expenditure causes the municipal government to systematically reduce spending on other services (from the level they would otherwise choose), the parameter estimating the impact of LSS expenditures on the spending category studied should be significant and negative. However, if the parameter differed insignificantly from zero, this would indicate that the changes in the spending category are determined by changes in exogenous factors only and thus, the level of LSS expenditures does not directly affect the choice of spending category. If so, this would be interpreted as no evidence or support of the crowding out hypothesis.

Finally, municipality fixed effects are included to control for unobserved municipality factors that remain fixed over time. Dummy variables for year fixed effects are also included.

5. Empirical results and discussion

In this section, the regression results from the five spending categories are presented and discussed. The section starts out with a test against endogeneity of the LSS expenditure variable, followed by a discussion of the validity and relevance of the instruments used. The section ends with the presentation and discussion of the regression estimates: the results for elderly & disabled care and education spending are presented in Table 3, and the results for social assistance, childcare & preschool, and culture & leisure spending are presented in Table 4.[17]

Test against endogeneity

As discussed in the previous section, the expenditure on some or all of the spending categories may be simultaneously decided with the expenditure on LSS. Therefore, a test of whether LSS expenditure can be treated as exogenous is performed. Under the null hypothesis that the

[17] In the regressions where the LSS expenditure variable is endogenous, the OLS estimates are just included for comparison; vice versa, in the regressions where the LSS expenditure variable can be treated as exogenous, the 2SLS estimates are just included for comparison.

specified endogenous regressor can actually be treated as exogenous, the test statistic is distributed as chi-squared with one degree of freedom.[18] The test results are presented in Table 2.

As can be seen in the Table 2, we reject the null hypothesis that LSS expenditure can be treated as exogenous in the elderly & disabled care spending equation as well as in the education spending equation. That is, LSS expenditure is simultaneously determined with both these spending categories. These results are as expected. The LSS services and elderly & disabled care are part of the same service area and the same social service sector budget; the expenditures are therefore decided simultaneously. For education, this result is also as expected. Education is one of the two largest sectors within municipality service, and when allocating budget to the educational sector, it will depend on the cost of services to functionally impaired, among other things.

Table 2. Test if LSS expenditure per capita can be treated as exogenous

Spending category / Dependent variable	Test against endogeneity	Chi-sq(1) P-value	Reject H_0?	2SLS or OLS
Elderly & Disabled Care	3.28	0.070	Yes	2SLS
Education	9.63	0.002	Yes	2SLS
Social Assistance	0.24	0.627	No	OLS
Childcare & Preschool	0.20	0.655	No	OLS
Culture & Leisure	1.90	0.168	No	OLS

For the three other categories, social assistance, childcare & preschool, and culture & leisure, we fail to reject the null hypothesis. That is, LSS expenditure can be treated as exogenous in the spending equations for these three categories. For the two latter categories, this is what was expected. However, it might be surprising that social assistance and LSS expenditure are not simultaneously decided, despite being in the same social service sector. The reason for this is probably that social assistance is closely regulated in the Social Service Act, and that changes in spending on social assistance are not affected by LSS expenditures.

Validity of instruments

Since we reject the hypothesis that LSS expenditures can be treated as exogenous for the elderly & disabled and education spending categories, instruments are used to obtain unbiased results. The instruments chosen must be correlated with the endogenous regressor, but uncorrelated with

[18] Degrees of freedom are equal to the number of regressors tested, in this case only one (LSS expenditures).

the error term (Green, 2003). To test if the instruments are correlated with the endogenous regressor, a test of underidentification is performed. The hypothesis – that the excluded instruments are not correlated with the endogenous regressor – is rejected for both the elderly & disabled care model and the education model; i.e. the instruments are relevant. The test statistic is reported in Table 3.

To test if the instruments are uncorrelated with the error term, an overidentification test is performed. The Hansen J-statistic for this test is reported in Table 3. According to the test, for both elderly & disabled care and education spending categories, the hypothesis that the instruments are valid cannot be rejected, indicating that the instruments are in fact valid. To sum up, the LSS expenditure variable is endogenous in the models for elderly & disabled care expenditure and education expenditure. Furthermore, both the underidentification and the overidentification tests confirm that the chosen instruments (the three LSS services variables) are, in fact, both valid and relevant instruments.

Regression results

Spending on Elderly & disabled care

Let us start with the elderly & disabled care spending category. As mentioned earlier, if LSS expenditure is endogenous in the model(s), the magnitude of the effect of LSS expenditure on elderly & disabled care spending will be underestimated by OLS. By comparing OLS and 2SLS estimates for spending on elderly & disabled in Table 3, the underestimation (in absolute terms) of the effect of LSS expenditure is evident: the OLS estimate is –0.140, while the 2SLS estimate is –0.418. From now on, the focus will be on the 2SLS results. In order to support the hypothesis that LSS expenditure crowds out other municipal expenditure, the LSS expenditure parameter should have a negative and significant effect on the expenditure studied. The result supports this hypothesis; it is indeed both negative and highly significant. The point estimate shows that for every 100 SEK increase in LSS expenditure, the expenditure on elderly & disabled care decreases by approximately 42 SEK.

In the model that estimates expenditures on elderly & disabled care, the coefficients of the explanatory variables for the share of elderly living in special residential homes, tax base, grants, and share of elderly, are as expected: all have a positive effect on the expenditure on elderly care (i.e. an increase in any of these variables increases the spending on elderly care). The (log) total

population and the share of welfare recipients have a negative effect on the expenditure on elderly care (i.e. an increase in any of these variables decreases the spending on elderly care).

Table 3. Estimated results for Elderly & Disabled spending and Education spending

	Dependent Variables			
	Elderly & Disabled Care		Education	
Explanatory Variables	OLS	2SLS	OLS	2SLS
LSS expenditure, SEK	-0.140***	-0.418***	0.071*	-0.355**
	(0.038)	(0.139)	(0.039)	(0.149)
Elderly with home care	-3.66	-3.07	--	--
	(10.23)	(10.04)		
Elderly living in special homes	88.28***	84.81***	--	--
	(15.04)	(15.30)		
Tax base t-1	0.074***	0.067***	0.058***	0.048***
	(0.009)	(0.010)	(0.008)	(0.009)
Grants t-1	0.202***	0.185***	0.230***	0.204***
	(0.028)	(0.029)	(0.026)	(0.028)
Debt t-1	0.002	0.003	-0.004	-0.004
	(0.004)	(0.004)	(0.003)	(0.004)
Ln Population t-1	-17460***	-18866***	3778**	1601
	(1861)	(2093)	(1767)	(2058)
Welfare t-1	-60.48***	-54.73***	-39.53**	-30.31*
	(17.32)	(17.11)	(15.43)	(16.92)
Share children (0-6) t-1	120.4**	154.9**	-263.4***	-210.1***
	(57.84)	(62.71)	(55.37)	(62.21)
Share youth (7-15) t-1	41.1	62.9	203.7***	236.8***
	(43.62)	(45.28)	(46.37)	(50.74)
Share elderly (75+) t-1	425.7***	480.4***	-169.8***	-86.2
	(51.88)	(56.46)	(51.98)	(60.60)
Unemployment t-1	10.59	-6.540	89.80***	63.97**
	(24.33)	(26.84)	(26.09)	(29.24)
Year effects	yes	yes	yes	yes
Fixed effects	yes	yes	yes	yes
R-squared (within)	0.664	0.649	0.727	0.698
Observations	2592	2592	2592	2592
Number of municipalities	288	288	288	288
Endogeneity test		3.96		9.63
Chi-sq(1) P-value		0.05		0.00
Underidentification test		71.41		70.86
Chi-sq(3) P-value		0.00		0.00
Hansen J statistic		3.58		3.15
Chi-sq(2) P-value		0.17		0.21

Note: The standard errors in parenthesis are robust to heteroskedasticity. *** p<0.01, ** p<0.05, * p<0.1 represent significance at the 1, 5 and 10 percent level, respectively. Instruments: share of individuals receiving LSS services per 10,000 inhabitants, share with the service "adults in residential homes", and share with the service "daily activity". Regressions are estimated with the XTIVREG2 command in STATA (Schaffer, M.E. 2007).

Education spending

The OLS estimate is also underestimated for LSS expenditure in the education spending equation. The OLS estimate is 0.07, while the 2SLS estimate is –0.36. Contrary to the result for the elderly & disabled where both the OLS and the 2SLS estimate were negative, the OLS estimate in the education equation is positive and significant at the ten percent level, while the 2SLS estimate is negative and significant at the five percent level. Not accounting for the simultaneity bias in the education spending equation would lead to an incorrect conclusion on how this sector is affected. Since LSS expenditure is endogenous here, we will focus on the 2SLS estimates.

In Table 3, we can see that expenditure on education is negatively and significantly affected by the LSS expenditure; once more supporting the crowding out hypothesis. The point estimate shows that the expenditure on education approximately decreases by 35 SEK for every 100 SEK increase in LSS expenditure. It is evident that education expenditure is greatly affected by increased expenditure on LSS services, despite its being in a different sector. Education is the second largest sector of the municipalities. Combined with being an area where municipalities' have the power to decide on how to provide education (although governed by the Education Act) – this makes it an area that is easily affected when resources must be reallocated within the municipality. For the explanatory variables in the education expenditure model, we can see that tax base, grants, share of youth, and share of unemployment all have a positive effect on spending on education. The share of young children and the share of welfare recipients have a negative effect on education spending.

Social assistance spending

Let us now move on to the third spending category, social assistance. Since LSS expenditure can be treated as exogenous in this equation, the OLS estimates are not biased here as they were in the two previous categories. As can be seen in Table 4, the LSS expenditure parameter is negative, but non significant for the social assistance model. This indicates that LSS expenditure does not affect or crowd out spending on social assistance. So even though elderly & disabled care, social assistance, and services to functionally impaired together make up the social service sector, only elderly & disabled care is affected by the increasing expenditure on services to functionally impaired. This result may seem surprising. However, since social assistance is strictly governed by the Social Service Act, combined with being a small area within the municipality as well as within the social service sector, there is no room for its expenditure to be crowded out;

the cost will be too high. Therefore, the burden of financing the LSS services might fall on the service provision to elderly & disabled care rather than social assistance provision.

Table 4. Estimated results for Social Assistance, Childcare & Preschool, and Culture & Leisure spending.

	Dependent Variables					
	Social Assistance		Childcare & Preschool		Culture & Leisure	
Explanatory Variables	OLS	2SLS	OLS	2SLS	OLS	2SLS
LSS expenditure, SEK	-0.004	0.020	0.008	0.029	0.006	0.069
	(0.016)	(0.070)	(0.016)	(0.064)	(0.011)	(0.047)
Tax base t-1	-0.003	-0.002	0.039***	0.039***	0.010***	0.012***
	(0.004)	(0.006)	(0.004)	(0.004)	(0.003)	(0.003)
Grants t-1	0.017	0.018	0.111***	0.112***	0.039***	0.043***
	(0.013)	(0.013)	(0.013)	(0.017)	(0.008)	(0.009)
Debt t-1	-0.002	-0.002	-0.003*	-0.003*	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Ln Population t-1	-3050***	-2928***	10233***	10342***	906.3	1228**
	(866.8)	(925.9)	(933.6)	(1014)	(559.4)	(613.6)
Welfare t-1	98.55***	98.04***	2.58	2.12	-16.43***	-17.79***
	(12.19)	(12.12)	(8.37)	(8.42)	(6.03)	(6.32)
Share children (0-6) t-1	-68.1**	-71.0**	317.1***	314.5***	-47.2***	-55.1***
	(31.41)	(32.52)	(33.13)	(34.48)	(17.73)	(19.06)
Share youth (7-15) t-1	-78.8***	-80.6***	23.4	21.7	3.1	-1.8
	(24.76)	(25.30)	(23.15)	(23.87)	(15.31)	(15.56)
Share elderly (75+) t-1	-7.68	-12.33	-2.95	-7.12	10.78	-1.59
	(27.05)	(30.31)	(28.20)	(30.93)	(18.02)	(19.84)
Unemployment t-1	-4.29	-2.86	1.38	2.67	-6.13	-2.31
	(11.59)	(12.19)	(11.85)	(12.31)	(12.13)	(12.57)
year effects	yes	yes	yes	yes	yes	yes
fixed effects	yes	yes	yes	yes	yes	yes
R-squared (within)	0.320	0.319	0.731	0.731	0.145	0.130
Observations	2592	2592	2592	2592	2592	2592
Number of municipalities	288	288	288	288	288	288
Endogeneity test		0.24		0.20		1.90
Chi-sq(1) P-value		0.63		0.66		0.17
Underidentification test		70.89		70.86		70.86
Chi-sq(3) P-value		0.00		0.00		0.00
Hansen J statistic		3.63		1.48		0.11
Chi-sq(2) P-value		0.16		0.48		0.95

Note: The standard errors in parenthesis are robust to heteroscedasticity. *** p<0.01, ** p<0.05, * p<0.1 represent significance at the 1, 5 and 10 percent level, respectively. Instruments: share of individuals receiving LSS services per 10,000 inhabitants, share with the service "adults in residential homes", and share with the service "daily activity". Regressions are estimated with the XTIVREG2 command in STATA (Schaffer, M.E. 2007)

Childcare & preschool spending

For the fourth spending equation, childcare & preschool, the LSS expenditure can be treated as exogenous. Similarly to the social assistance category, there is no indication that childcare & preschool is affected by the increasing expenditure on LSS services. This result is realistic, since the spending on childcare & preschool only constitutes a smaller share of the total municipal budget. Therefore, it is not likely that the municipalities will make budget cuts in this category in order to finance LSS services.

Culture & leisure spending

Finally, for the last spending category, culture & leisure, it can be seen in Table 4 that the LSS expenditure coefficient is once more non significant, showing no evidence of crowding out. Since culture & leisure is the only category that is voluntary for the municipalities, it could be expected that increasing LSS expenditure would affect spending on culture & leisure in a negative way. However, the result indicates that the municipalities choose to reallocate resource from other categories, instead of decreasing spending on culture & leisure in order to finance the LSS service provision. One reason why the municipalities do not use resources from culture & leisure may be that this category is small and a decrease here would be more evident than a similar decrease in a larger size category. The results also point toward the fact that the municipalities indeed want to provide a certain level of culture & leisure and are therefore reluctant to decrease this spending; just to avoid their citizens migrating to other regions, so-called "Tiebout migration". Although a municipality's expenditure on culture & leisure may not be enough for anybody to migrate, it is a visible area and it is likely to act as a signal.

6. Conclusion

The focus of this study was to investigate the hypothesis that crowding out occurs within the local governments with respect to expenditures on one particular service area; services to functionally impaired individuals. It became the responsibility of the municipalities to provide this service in 1994 via a reform, and the expenditures on this service have increased ever since. While the findings of this study do not support the existence of crowding out for three of the five expenditure categories studied (social assistance, childcare & preschool and culture & leisure), the findings strongly support crowding out of expenditures on elderly & disabled care and expenditures on education, both in a statistical and an economic sense.

The results differ from those in the other studies on expenditure crowding out mentioned in the introduction; where none of those studies find support for the crowding out hypothesis. The difference between this study and previous studies might be the characteristics of the service area studied in this paper. At least three reasons come to mind. First, the area studied, i.e. services to the functionally impaired, is regulated via a strong entitlement law; the municipality must provide the care and services. Second, the expenditures on these services greatly exceeded the estimated costs (as predicted when the reform was implemented). For the municipality to finance the services, it must reallocate resources or crowd out other municipality expenditures. Third, the increasing LSS expenditures were not matched by any additional grant or funding for many years. This did not happen until 2004 when an intergovernmental LSS expenditure equalization grant system was implemented. However, the LSS expenditure equalization grant is not based upon the municipalities' factual costs, instead it is based upon standardized costs calculated and set by the national government. Thus, the crowding out of other expenditures is likely to have continued also after 2004. Therefore, for municipalities to finance their spending on services to the functionally impaired, the result obtained here is very plausible, i.e. the spending on services to the functionally impaired crowds out other municipal expenditures.

Naturally, an extended time series would be useful for studying if the crowding out of expenditure persists over time, or if it flattens out. It would also be interesting to study if crowding out of these expenditures continues after the new intergovernmental expenditure equalization system (directed toward expenditures for LSS services) has been fully implemented (in 2009). Although the equalization grant/fee is not based on factual cost but rather on standardized calculated cost, it would be interesting to study if this is sufficient for the crowding out to vanish.

This study shows the importance of considering the effect on other areas within the local government service provision when there are reforms, decentralization or national government intervention imposing new services on local governments targeted to a specific area. Moreover, the different effects on different expenditure categories must be taken into account when new services are imposed on local governments, making the findings in this study relevant in terms of policy implications and the design of new reforms.

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Appendix A: Variable definitions

Table A. Variable definitions and data sources

Variable name	Description	Data source
Elderly & disabled care spending	The per capita municipal spending on elderly & disabled care calculated in 2007 monetary value, in SEK	WebOr
Childcare & pre-school spending	The per capita municipal spending on childcare & preschool calculated in 2007 monetary value, in SEK	WebOr
Education spending	The per capita municipal spending on education calculated in 2007 monetary value, in SEK	WebOr
Social Assistance spending	The per capita municipal spending on social assistance (including welfare benefits, expenditures on rehab for drug and alcoholic users) calculated in 2007 monetary value, in SEK	WebOr
Culture & Leisure spending	The per capita municipal spending on culture & leisure calculated in 2007 monetary value, in SEK	WebOr
Expenditures on services for functionally impaired (LSS)	The per capita municipal spending on services to functionally impaired individuals calculated in 2007 monetary value, in SEK	WebOr
Home service (elderly care)	The percentage of the population that receives any type of elderly care in their homes	Kommun-databasen
Special residence (elderly care)	The percentage of the population that lives in special residence homes for the elderly	Kommun-databasen
Tax base, SEK	Tax base per inhabitant calculated in 2007 monetary value, in SEK	SCB

To be continued

Table A1. continue

Grants, SEK	1998-2004: the municipality's income from general inter-governmental grants per capita calculated in 2007 monetary value; 2005-2006; the sum of municipal equalization per capita	SCB
Debt (long-term), SEK	The municipality's long-term debt per capita calculated in 2007 monetary value, in SEK	SCB
Population, log	The natural logarithm of the municipality's population	SCB
Welfare, percent	The percentage of the population that has received welfare benefits	Kommun-databasen
Unemployment, percent	The percentage of the population unemployed	Kommun-databasen
Population age 0-6, percent	The percentage of the population up to 6 years of age	SCB
Population age 7-15, percent	The percentage of the population between 7 and 15 years of age	SCB
Population age 75+, percent	The percentage of the population aged above 75	SCB
LSS Daily Activity, percent	The percentage of the "LSS population" that receives the service "daily activity"	NBHW
LSS Adult Residential home, percent	The percentage of the "LSS population" that lives in special residential homes for adults	NBHW
LSS individuals per 10000 inhabitants	The number of persons receiving any type of LSS service per 10000 inhabitants	NBHW

Note: The data sources are SCB = Statistic Sweden; WebOr and Kommundatabasen = data from SCB but with tools to analyze municipalities and counties; NBHW = National Board of Health and Welfare