

Borge, Lars-Erik; Rattsø, Jørn

Working Paper

Young and old competing for public welfare services

CESifo Working Paper, No. 2223

Provided in Cooperation with:

Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Borge, Lars-Erik; Rattsø, Jørn (2008) : Young and old competing for public welfare services, CESifo Working Paper, No. 2223, Center for Economic Studies and ifo Institute (CESifo), Munich

This Version is available at:

<https://hdl.handle.net/10419/26268>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

YOUNG AND OLD COMPETING FOR PUBLIC WELFARE SERVICES

LARS-ERIK BERGE
JØRN RATTSSØ

CESIFO WORKING PAPER NO. 2223
CATEGORY 1: PUBLIC FINANCE
FEBRUARY 2008

An electronic version of the paper may be downloaded

- *from the SSRN website:* www.SSRN.com
- *from the RePEc website:* www.RePEc.org
- *from the CESifo website:* www.CESifo-group.org/wp

YOUNG AND OLD COMPETING FOR PUBLIC WELFARE SERVICES

Abstract

Generational conflict affects the supply of public welfare services, and the rising share of elderly is seen as a threat to educational spending. We offer an analysis of spending in child care, primary and lower secondary education, and care for the elderly related to the size of young and old voters. Using panel data from Denmark for the period 1989-1996, we find that the elderly are reducing spending in child care and education, but the young do not threaten elderly care. It is a disadvantage for both the elderly and the young to be part of a large cohort.

JEL Code: H42, H72.

Keywords: public welfare services, group size, age composition of the population, generational conflict.

Lars-Erik Borge
Department of Economics
Norwegian University of Science and
Technology
7491 Trondheim
Norway
larseb@svt.ntnu.no

Jørn Rattsø
Department of Economics
Norwegian University of Science and
Technology
7491 Trondheim
Norway
jorn.rattso@svt.ntnu.no

An earlier version of this paper was presented at the Annual Meeting of the European Public Choice Society (Sienna), at seminars at ZEI (Bonn) and Aarhus Business School, and at the Norwegian-German Seminar on Public Economics (Garmisch-Partenkirchen). We are grateful for comments from the participants, in particular from Jørgen Lotz, Jürgen von Hagen, Matz Dahlberg, and Alexander Kemnitz. The data are kindly provided by the Ministry of Finance in Copenhagen.

1. Introduction

Voter groups compete for shares of the public budget, and recently the focus has been set to the conflict between age groups in educational spending. The rising share of elderly voters is seen as a threat to educational spending. Poterba (1997, 1998) analyzes the negative correlation between the share of elderly and educational spending across US states. Fernandez and Rogerson (1997) report similar results, while the relationship is challenged by Ladd and Murray (2001). Harris et al. (2001) confirm that a growing share of elderly tends to depress spending in education analyzed at the school district level. Similar results are reported in European studies such as Borge and Rattsø (1995) for Norway and Grob and Wolter (2005) for Switzerland. Most of this literature links elderly voters to spending for schools. We extend this evidence to analyze the determination of child care, primary and lower secondary education, and care for the elderly taking into account both young and old. The decentralization of services for the young and the old in the Scandinavian welfare states, here Denmark, allows for the simultaneous analysis of several age groups and services.

Welfare states are first and for all about redistribution over time to finance public welfare services. In the short run this redistribution implies a conflict between generations. Public welfare services are redistributive and each of them has a client group typically defined by age. In the literature, these services are described as ‘concentrated benefits’, ‘directed spending’ and ‘particularistic goods’. The services can be understood in terms of congestion. With full crowding, the publicly provided services are private goods, and the degree of crowding is an empirical issue.

In the Scandinavian welfare states, the relevant public services are decentralized to local governments. The allocation of public welfare services between age groups is determined in the context of a local democracy. This is a challenge to the standard Musgrave-Oates-Tiebout model of local public finance assuming local public goods and benefit taxation. An understanding of the generational conflict must take into account the role of different voter age groups in the allocation of redistributive services.

Across the Scandinavian countries, the public debate has signaled worry about the provision

of public services to the growing number of elderly. Large cohorts now enter age groups with high demand for public care. Resources to expand services for the elderly must be financed by higher taxes or reallocation from age groups in decline. The resistance to higher taxes and conflicting claims from other groups may imply that the elderly loose out. They may experience the disadvantage of being many. Borge and Rattsø (1995) address this concern in an early study of Norway, and they find a clear negative effect of age group size on spending per client. Lotz and Aagesen (1997) offer a number of partial analyses of the relationship between size of age groups, measures of service output, and spending per client for Denmark. In this paper we integrate the partial relationships between age group size and spending in a full demand model of public welfare services. Strömberg (1998) separates between demand and political influence of the elderly in neighboring Sweden. He finds that a rising share of elderly increases their political influence, but the results are not inconsistent with a decline in spending per elderly when the number of elderly goes up.

We have a dataset of local government service spending and age groups of the population for the period 1989-1996 made available to us by the Danish Ministry of Finance. The panel allows an investigation of the relationship between shares of age groups and spending per inhabitant in the relevant age groups for three services: child care, education, and care for the elderly. We address the methodological challenge of Tiebout-bias by using historical measures of the age composition as instruments in line with Harris et al. (2001) and Ladd and Murray (2001). Our estimates indicate that the elderly reduce spending in child care and education, but the young do not threaten services for the elderly. The results furthermore support the hypothesis that it is a disadvantage for both the young and the elderly to be part of a large cohort.

Section 2 clarifies the understanding of generational conflict and (dis)advantage of large cohorts. The institutional setting in Denmark is described in Section 3, and Section 4 presents data and empirical specification of the analysis. Section 5 discusses the results, and Section 6 offers concluding remarks.

2. Understanding generational conflict

The demand model for public services is the obvious starting point to understand demographic shifts and conflicts between age groups. Different age groups have different demand for public services. The standard understanding of demographic shift is that the identity of the median voter changes, as suggested by Inman (1978). When the median voter gets older, public spending will shift from services to the young to care for the elderly. The budget constraint shows the disadvantage of being part of a large cohort. Given the available finances and service level, a larger client group will be more expensive to serve. The cost effect is likely to reduce spending per client when the number of clients goes up. The demand models consequently identify a tradeoff between political influence versus service costs. On the one hand increased size of a voter group means more political influence, but on the other hand spending must go up to keep the service level constant for the whole group.

Empirical analyses often have assumed a broader ‘community preference’ including demographic descriptives since the median voter assumes single dimensionality. Cutler et al. (1993) analyze the effects of demographic shift for local spending levels in this context. The normative implications of ‘community composition’ are worked out by Schwab and Oates (1991). The research has shifted towards the understanding of political institutions and an early contribution by Craig and Inman (1986) proposes a voter group decision model, where the actual outcome is a weighted average of each group's preferred allocation. More recent contributions apply probabilistic voting models as the foundation for fiscal demand analysis and Holtz-Eakin (1992) presents the linkages between median voter and probabilistic demand models. Borge et al. (1995) provide an empirical analysis of how reallocation of resources between different age groups is affected by interest group pressure.

Recent theoretical contributions have added arguments beyond this simple understanding of generational conflict. Strömberg (1998) argues that altruism may modify the conflicting claims. The selfish battle for age group influence does not capture the links between generations at any point in time and the intertemporal distribution over the life time for each individual. Duncombe et al. (2003) find in survey data that elderly with grand children are more likely to support school spending than those without. The cost effect of the size of the

cohort may include economies of scale that will modify the cost effect. In this case, spending per client may go down with increasing size of an age group even when service level for each individual in the group goes up.

Dynamic intergenerational redistribution has been investigated in particular with respect to social security, and Grossman and Helpman (1998) have worked out an overlapping generation (OLG) framework to discuss political aspects. Holtz-Eakin et al. (2004) apply the OLG framework to analyze how aging affects school expenditures and economic growth. Their simulations imply that aging has a negative output effects through lower school expenditures, and that this dominates the positive effects of lower taxes. On the other hand, Gradstein and Kaganovich (2004) develop an OLG model where increased longevity has a positive effect on education funding and economic growth. The intuition is that working adults experience a higher probability of survival into retirement, and choose to increase their support for schooling to increase the returns on their savings for retirement.

Voting behavior of age groups reflects other factors than their own services. Brueckner and Joo (1991) show how homeowners have incentives to take into account the capitalization effect of public services. In our context elderly voters may support school spending to raise the value of their house. The finding of Harris et al. (2001) that the generational conflict is more severe for state financed school spending than for locally financed spending indicate that capitalization weakens the conflict between young and old at the local level. Brunner and Balsdon (2004) use survey data and find that support for school spending generally declines with age, but less so for local spending than for state spending. Their results are consistent with both capitalization of local spending into housing values and intergenerational altruism.

The relationships between age groups and age related public welfare services are complex and related to several adjustment mechanisms. Our data allow a reduced form investigation of the relationships and future work must address tests of alternative channels of effect.

3. Public welfare services and age groups in Denmark

Denmark has 275 local governments¹ primarily producing child care, primary and lower secondary education, care for the elderly, and local infrastructure. Home care and institutionalized care (i.e. nursing homes) for the elderly represent about half of local government spending. Education and child care take another ¼ of the spending. The government is among the most decentralized in the world. The local governments produce about 20% of the national product and the full local public sector (including county level with hospitals) is about 30% of national product or 50% of total public spending. Lotz (1991, 1998) presents the rationale of the Danish design. Mouritzen (1991) offers a comprehensive evaluation of the functioning of the local political system.

Table 1

Age composition, spending per client, private income and block grants

Year	Age composition (%)			Spending per client			Private income	Block grants
	0-6	7-15	80+	Child	Educat.	Elderly		
1989	7.5	11.3	3.6	1.00	1.00	1.00	1.00	1.00
1990	7.6	10.9	3.7	1.00	1.01	0.96	1.00	1.04
1991	7.9	10.5	3.7	1.01	1.04	0.93	1.00	0.95
1992	8.1	10.2	3.8	1.04	1.05	0.91	1.01	0.98
1993	8.3	9.9	3.9	1.08	1.09	0.90	1.02	1.09
1994	8.5	9.8	3.9	1.13	1.10	0.90	1.08	1.05
1995	8.8	9.7	3.9	1.10	1.12	0.87	1.08	1.03
1996	9.0	9.7	3.9	1.13	1.13	0.90	1.12	0.73

All figures are weighted averages. Spending per client, private income and block grants are in 1996 prices and measured as an index where the average value for 1989 equals unity. Private income and block grants are measured per capita.

The present study concentrates on child care, education, and care for the elderly. These services are publicly provided private goods directed towards specific subgroups of the population. The relevant ‘client’ group for child care is children aged 0-6 years and for primary and lower secondary education children aged 7-15 years. Care for the elderly covers only a share of the elderly population and elderly 80 years and above represent the main target group. Spending in care for the elderly is scaled by the share of the population 80 years and above. The development of spending per ‘client’ and the population shares of the client

¹ A reform implemented in January 2007 reduced the number of local governments to around 100.

groups are displayed in Table 1. During the period under study (1989-1996) the major demographic shift occurred in the younger age groups. Children eligible for child care have increased their share of the population, whereas children eligible for primary and lower secondary education have been in decline. There has been a modest increase in the share of the population 80 years and above.

The two younger age groups have experienced a similar development of spending per client. Child care spending care per child 0-6 years and educational spending per student both increased by 13% in real terms from 1989 to 1996, which is equivalent to an average annual growth rate of 1.8%. In the care for the elderly sector spending per inhabitants 80 years and above declined by 10% (or 1.5% per year).

The raw data in Table 1 do not provide any clear evidence regarding the relationship between group size and spending per client. In primary education and care for the elderly there seem to be a disadvantage of being part of a large cohort. An increasing share of elderly is associated with lower spending per elderly, whereas a declining population share for children 7-15 years of age is associated with higher educational spending per student. On the other hand, spending on child care per child 0-6 years of age has increased in a period with a growing population share. Generational conflict and the disadvantage of being part of a large cohort must be investigated in the context of a model including other determinants of public welfare spending.

The local income tax is the main source of revenue for Danish local governments and amounts to nearly 70% of total revenue. The average annual growth of the income tax base (private income in Table 1) was 1.6% during the period under study. The equalization system is to large extent arranged as pure redistribution among the local governments. Transfers to local governments with high spending needs and/or low tax bases are financed by contributions from authorities with low spending needs and/or high tax bases. As a consequence, block grants from the national government only account for 10% of total revenue. The block grants have been quite stable during the period under study.²

² The sharp decline from 1995 to 1996 is due to changes in the grant system.

Table 2

Descriptive statistics for the change in population shares (%-points), 1989-1996

Age group	Min	1. quart.	Median	3. quart.	Max	St.dev.
0-6 years (<i>CH06</i>)	-1.4	0.7	1.3	1.7	3.5	0.74
7-15 years (<i>CH715</i>)	-5.1	-2.2	-1.7	-1.3	0.7	0.87
80 years and above (<i>EL80+</i>)	-0.4	0.2	0.4	0.6	1.6	0.32
67 years and above (<i>EL67+</i>)	-4.4	-0.1	0.3	0.8	3.4	0.95

The figures are based on data for 275 local governments.

The models estimated include community and year fixed effects, and the crucial issue is whether there is sufficient time series variation in the data. More precisely, do the local governments experience sufficiently different demographic development during the period under study? Information on the time series variation is provided in Table 2 where we report descriptive statistics for the change in population shares from 1989 to 1996. It is evident that the aggregate development in Table 1 masks substantial variation across local governments. The change in the share of children 0-6 years of age varies from a reduction of 1.4 percentage points to an increase of 3.5 percentage points, a sample range of nearly 5 percentage points. The interquartile range is 1 percentage point. The variation is equally large for the share of children 7-15 years of age, with a sample range of nearly 6 percentage points and an interquartile range of nearly 1 percentage point. It can also be seen that the variation is substantially less for the share of elderly 80 years and above. The sample range is only 2 percentage points and the standard deviation is less than half of that for the two younger age groups. A broader measure of the elderly, the share of the population 67 years and above, shows slightly more variation than the two younger age groups. In the empirical analysis this broader measure of the elderly will be used as an alternative to capture generational conflict. Although the time span is short, we conclude that the data set is rich in the sense that it includes local governments with very different demographic development.

4. Data and empirical specification

The analysis is based on a balanced panel data set covering all 275 Danish local governments during the period 1989-1996. The data are based on local government accounts and population statistics, and have been made available to us by the Danish Ministry of Finance. The dependent variable (E_{it}) is real spending per client in child care, education, or care for the elderly in community i in year t . The following core empirical specification is applied for

all three service sectors:

$$\log(E_{it}) = \beta_1 \log(TINC_{it}) + \beta_2 \log(CH06_{it}) + \beta_3 \log(CH715_{it}) + \beta_4 \log(EL80+_{it}) + \alpha_t + \eta_i + \varepsilon_{it} \quad (1)$$

The explanatory variables are per capita income ($TINC_{it}$), the share of children 0-6 years of age ($CH06_{it}$), the share of children 7-15 years of age ($CH715_{it}$), and the share of the population 80 years and above ($EL80+_{it}$).³ Spending and total income are measured in real terms. A set of time dummies (α_t) capture time specific factors common to all local governments. Finally, (η_i) is a community specific term and ε_{it} an error term. The specification is similar to Poterba (1997), but is generalized to a broader set of public welfare services.

We started out with private income and block grants as separate external sources of revenue, but in line with other studies of Danish local governments we have not obtained reliable estimates of the block grant effect. Block grants are partly selffinanced (see Section 3) and this may explain the unstable estimates. Below we report results using the sum of private income and block grant ($TINC$) as income variable. The effects of the demographic variables are robust to alternative specifications of the income variables.

All equations estimated take account of community specific fixed effects. The statistical inference is then based on the time series variation in the data, how changes in the age composition of the population over time affect the composition of services. The model is estimated with the least squares dummy variable method and by differencing out the community specific effect. The main methodological challenge is the importance of mobility. If the client groups move from local governments with low spending per client to local governments with high spending per client, population shares and spending per client are jointly determined, and Tiebout-bias is a potential problem. The direction of the Tiebout-bias is likely to differ between the direct effects and the cross effects.⁴ To see this, suppose that

³ Description and summary statistics for the variables are reported in the appendix Table A1.

⁴ The direct effects refer to the (dis)advantage of being part of a large cohort, while the cross effects refer to

both the direct effects and the cross effects are negative. Since the Tiebout-effect produces a positive correlation between the relative size of the client group and spending per client in their own sector, the true direct effect is likely to be underestimated (in absolute value) when the simultaneity problem is not taken into account. On the other hand, since the different population groups compete for resources, the Tiebout-effect produces a negative correlation between the relative size of a client group and spending per client in other sectors. Then the true cross effects are likely to be overestimated (in absolute value). The potential Tiebout-bias is handled by use of instruments. We follow Harris et al. (2001) and Ladd and Murray (2001), and use historical measures of the age composition as instruments. In addition we utilize that business cycle effects on population growth and age composition vary between urban and rural communities.

5. Estimation results

The core panel data model with data for 1989-1996 and using community specific fixed effects is presented as the first set of estimates (fixed effects, baseline) in Table 3. The direct elasticities are significantly negative, i.e. *CH06*, *CH715* and *EL80+* come out with negative signs for child care, education, and care for the elderly respectively. The disadvantage of being part of a large cohort is strongly supported. Spending per client tends to be reduced when relative group size increases. The elasticities range from -0.64 in care for the elderly to -0.79 in child care, and are of roughly of the same magnitude in the three sectors.

The cross effects capture generational conflict. The main effect identified is that an increased share of elderly has a significant negative effect on spending in child care and education, i.e. the elderly crowd out spending for the young. The crowding out effect is stronger for child care than for education. There is no evidence of the opposite effect that the younger age groups contribute to lower spending in care for the elderly.

generational conflict.

Table 3
Regression analyses

Variable	Fixed effects, baseline			Fixed effects, additional controls			Differencing		
	Child care	Education	Elderly care	Child care	Education	Elderly care	Child care	Education	Elderly care
$\log(TINC)$	0.914 (7.79)	0.269 (5.00)	0.049 (0.56)	0.777 (6.53)	0.212 (4.41)	-0.036 (-0.43)	2.059 (8.20)	0.480 (4.48)	-0.015 (-0.08)
$\log(CH06)$	-0.792 (-7.19)	-0.191 (-4.62)	-0.016 (-0.25)	-0.686 (-6.05)	-0.158 (-3.68)	0.012 (0.18)	-0.724 (-6.20)	-0.161 (-3.15)	-0.022 (-0.26)
$\log(CH715)$	-0.042 (-0.32)	-0.680 (-12.96)	-0.012 (-0.15)	-0.037 (-0.29)	-0.689 (-13.13)	-0.018 (-0.23)	-0.070 (-0.44)	-0.595 (-8.70)	-0.071 (-0.76)
$\log(EL80+)$	-0.231 (-3.07)	-0.049 (-1.73)	-0.641 (-10.78)	-0.217 (-3.14)	-0.059 (-2.12)	-0.660 (-11.18)	-0.191 (-2.00)	-0.027 (-0.69)	-0.510 (-7.28)
$\log(POP)$				-0.428 (-1.47)	-0.313 (-2.20)	-0.448 (-2.12)			
$\log(SOC)$				0.029 (0.79)	-0.000 (-0.02)	-0.039 (-1.70)			
$\log(FWORKP)$				0.995 (6.89)	0.157 (2.32)	0.226 (2.18)			
Observations	2200	2200	2200	2200	2200	2200	275	275	275
R^2_{adj}	0.951	0.931	0.920	0.955	0.933	0.921	0.443	0.284	0.203

Dependent variables are log of spending per client for the three public services, time dummies are included in the fixed effects regressions, and a constant term in the differenced equations. The t-values in parentheses are based on robust standard errors.

In the second set of estimates we include some additional controls. These are population size (*POP*), the share of socialists in the local council (*SOC*), and female work participation (*FWORKP*).⁵ Female work participation is associated with higher resource use in all three sectors (reflecting demand for child care and day care services for younger school children, and less family based care for the elderly) and that growing communities are able to exploit economies of scale.⁶ The impacts of relative group size are very robust to the inclusion of additional controls. The main difference is that the impact of the share of children 0-6 years in child care is somewhat reduced in magnitude, making the direct elasticities even more similar across sectors.

The community specific effects can alternatively be eliminated by differencing, and the final set of estimations in Table 3 is based on the development from 1989 to 1996. By increasing the frequency from one to seven years, the length of the time period also becomes similar to the US studies by Poterba (1997), Harris et al. (2001), and Ladd and Murray (2001) that use data for every 10th year. The direct effects of relative group size come out highly significant also in this case, but the quantitative effects are somewhat reduced compared to the baseline estimates. The main generational conflict is still that the elderly impose lower spending for the younger age groups, but the impact in education is not statistically significant in this case.

The estimated income elasticities in Table 3 show that spending in child care is most responsive to changes in total income, whereas care for the elderly is least responsive. The lower elasticities for child care and education in the fixed effects specification may reflect that these estimates to a larger extent are affected by transitory changes in income.

⁵ Female work participation is measured as the fraction of women 20-44 years that is employed.

⁶ The weak effect of the share of socialists may reflect that the time series variation is limited as we only have data from two local elections.

Table 4
Fixed effects IV analysis

First stage regressions				Second stage (IV) regressions			
Variable	log(<i>CH06</i>)	log(<i>CH715</i>)	log(<i>EL80+</i>)	Variable	Child care	Education	Elderly care
log(<i>DE</i>) _{t-10} x d <i>U</i>	-0.817 (-7.94)	-0.113 (-1.56)	-0.111 (-0.93)	log(<i>CH06</i>)	-2.105 (-6.95)	-0.601 (-4.84)	0.401 (1.97)
log(<i>CH06</i>) _{t-10}	-0.176 (-4.97)	0.456 (17.06)	-0.030 (-0.78)	log(<i>CH715</i>)	-0.436 (-2.06)	-0.701 (-8.60)	0.146 (0.96)
log(67-79) _{t-10}	0.049 (1.18)	0.041 (1.48)	0.627 (13.57)	log(<i>EL80+</i>)	-0.498 (-2.70)	-0.067 (-1.03)	-0.570 (-4.54)
Observations	2200	2200	2200	Observations	2200	2200	2200
R^2_{adj}	0.927	0.973	0.990	R^2_{adj}	0.933	0.918	0.914

Dependent variables in the right panel are log of spending per client for the three public services. Time dummies and log of total income are included in all equations. The t-values in parentheses are based on robust standard errors.

We now turn to the handling of the possible simultaneity problem due to Tiebout sorting. Our point of departure in addressing the simultaneity problem is Harris et al. (2001) and Ladd and Murray (2001), who use the age composition 10 years before as instruments. Based on the same reasoning we use the share of children 0-6 years lagged 10 years as instrument for *CH715* and the share of the population 67-79 years as instrument for *EL80+*. The share of the population 20-44 years did not perform well as instrument for *CH06*,⁷ probably reflecting high mobility among younger adults. Our chosen instrument for *CH06* captures the fact that business cycle effects on population growth and age composition vary between urban and rural communities. The idea is that booms are associated with migration from rural to urban areas, and that this effect is particularly strong for younger adults with children below school age. We measure booms and busts by the change in the national unemployment rate (*dU*), while the urban-rural dimension is captured by the log of the population density (*DE*) measured as the number of inhabitants (lagged 10 years) per square kilometer. As instrument we use the product of the change in the unemployment rate and the log of population density.

Table 4 shows the estimation results when Tiebout sorting is taken into account. The results from the first stage regressions are reported in the left panel. The instruments perform well in the sense that they are significantly correlated with the relevant variables. Ten years lag of the share of children 0-6 years of age and the share of the population 67-79 years of age are as expected positively correlated with respectively *CH715* and *EL80+*. Moreover, the interaction term between the change in the unemployment rate and population density is significantly correlated with *CH06*. The interpretation of the negative coefficient is that the share of children increases more in urban areas than in rural areas in periods where the rate of unemployment is reduced.⁸

The second stage regressions in the right panel of Table 4 reveal that the direct effects of relative group size are negative and highly significant also when they are instrumented.⁹ The estimates of the share of children 7-15 years in education and the share of elderly 80 years

⁷ The variable was insignificant in the first stage regression.

⁸ Although the first stage regressions explain more than 90% of the variation in the variables to be instrumented, overfitting is not a problem. The reason is that only the variation beyond fixed effects and time dummies are used to estimate the parameters of interest. When this is taken into account, the first stage regressions explain 20-45% of the relevant variation in the variables to be instrumented.

⁹ Also Harris et al. (2001) and Ladd and Murray (2001) find that the impacts of demographics are not much

and above in care for the elderly are quite similar to the baseline fixed effects estimates. On the other hand the estimate of the share of children in child care increases substantially in absolute value. The absolute value is above unity, indicating that total spending in child care is reduced when the share of children 0-6 years increases.¹⁰ Also the IV estimates indicate that the main generational conflict is that the elderly impose negative effects on spending for the young. The quantitative effects are stronger than in the baseline fixed effects models, but the coefficient for educational spending is less precisely estimated. The two younger age groups impose negative effects on each other, but not on the elderly.

Table 5
Alternative measure of the elderly

Variable	Fixed effects, baseline		Differencing		Fixed effects IV	
	Child care	Education	Child care	Education	Child care	Education
log(<i>TINC</i>)	0.766 (6.47)	0.219 (4.14)	1.854 (7.20)	0.402 (3.63)	0.279 (1.38)	0.064 (1.02)
log(<i>CH06</i>)	-0.845 (-7.63)	-0.207 (-4.94)	-0.786 (-6.62)	-0.180 (-3.49)	-2.313 (-7.97)	-0.584 (-4.82)
log(<i>CH715</i>)	-0.125 (-0.95)	-0.707 (-13.52)	-0.140 (-0.89)	-0.622 (-9.08)	-0.467 (-2.13)	-0.723 (-9.16)
log(<i>EL67+</i>)	-0.528 (-4.31)	-0.152 (-3.29)	-0.397 (-3.20)	-0.107 (-2.29)	-0.334 (-1.69)	-0.127 (-1.93)
Observations	2200	2200	275	275	2200	2200
R^2_{adj}	0.953	0.932	0.457	0.294	0.933	0.921

Dependent variables are log of spending per client for the public services, time dummies are included in the fixed effects regressions, and a constant term in the differenced equations. The t-values in parentheses are based on robust standard errors. In the Fixed effects IV specification the share of the population 57-66 years of age lagged 10 years is used as instrument for log(*EL67+*). The instruments for log(*CH06*) and log(*CH715*) are the same as in Table 4.

In Tables 3 and 4 the generational conflict between the young and the elderly were identified using the share of the population 80 years and above as a proxy for elderly voters. The main motivation for this formulation is that the elderly 80 years and above is the main target group for care for the elderly. However, most elderly voters are below 80 years of age and they may also crowd out spending for the young.¹¹ In Table 5 we identify the generational conflict

affected by the use of instruments.

¹⁰ The elasticity remains above unity in absolute value also when we include additional controls or remove the community specific term by differencing.

¹¹ In 1996 the elderly 67 years and above made up 13.4% of the population, whereas elderly 80 years and above made up 3.9%.

using the share of the population 67 years and above as proxy for elderly voters. This definition of the elderly is also more in line with the US studies of generational conflict that use the share of the population above 65. It turns out that the generational conflict in most cases becomes stronger with this broader definition of the elderly. Moreover, in this case the negative impact of elderly in education is statistically significant also with differencing and instruments.

It is of interest to compare our findings with those from other studies. Since the international literature has focused on educational spending, the explicit comparison of estimates must be restricted to this sector. US studies have focused on generational conflict, and the results vary substantially across studies. Poterba (1997) finds strong evidence of generational conflict using state level data. He estimates the elasticity of school spending with respect to the share of elderly to be -0.26. Much weaker effects are found on lower level data. Harris et al. (2001) estimate elasticities of up to -0.10 using school district data, while Ladd and Murray (2001) find no evidence of generational conflict using county level data. Our estimates range from -0.10 to -0.15 when elderly is measured as the share of the population 67 years and above, and are most similar to the findings of Harris et al. (2001).¹² In addition, we document that this generational conflict is even more severe for child care, but that the younger age groups do not contribute to lower spending in care for the elderly.

Consistent with other studies, we find that there is a disadvantage for school children to be part of a large cohort. The direct elasticities are in the order of -0.6 to -0.7, and they are all significantly less than 0 and significantly larger than -1. Educational spending increases when the number of pupils increases, but not sufficiently to avoid a reduction in spending per pupil. The estimated disadvantage is somewhat larger than in US (Harris et al., 2001; Ladd and Murray, 2001) and German (Kempkes, 2007) studies using local government data, but less than in Poterba's (1997) study of the US states.¹³ Also Grob and Walter (2005), analyzing Swiss cantons, find that educational spending per student decreases when the number of students increases. Our analysis clearly shows that the disadvantage of being part of large

¹² Grob and Wolter (2005) use data for Swiss cantons (not local governments), and do also find evidence of generational conflict. They do not report a comparable elasticity, but we have calculated it to -0.23. Their finding seems to confirm that analyses of higher level government tend to find stronger generational conflict.

¹³ Poterba (1997) estimates the elasticity to be close to -1, which means that total educational spending remains

cohort extends to child care and care for the elderly, and that the order of magnitude is roughly the same as in the educational sector.

6. Concluding remarks

The Scandinavian local governments arrange public welfare services for the young and the old, and demographic shifts affect the political influence of the different age groups and the costs of providing the services. Whereas earlier contributions analyzing generational conflict and the (dis)advantage of being part of a large cohort have focused on educational spending, the decentralization of public welfare services in Scandinavia allows for a simultaneous analysis of services for the young and the elderly.

The econometric analysis is based on a panel data set for local governments in Denmark during the period 1989-1996, and focuses on child care, education, and care for the elderly. In line with earlier European and US studies, we find evidence of generational conflict in the sense that a larger share of elderly voters reduces educational spending. We also identify disadvantage of being part of a large cohort as a larger share of students in the population reduces educational spending per student. The extension to include services for the elderly and child care offers some new results. Elderly voters also reduce spending in child care, the young do not threaten services for the elderly, and both the young and the elderly have a disadvantage of being part of a large cohort.

Appendix

Table A1
Descriptive statistics

Variable	Description	Mean (st.dev.)
Expenditure per client in child care	Child care expenditures per child 0-6 years, Danish kroner (DKK), fixed 1996 prices	28779 (10055)
Educational expenditure per client	Educational expenditures per youth 7-15 years, DKK 1996	34510 (4381)
Care for the elderly expenditures per client	Care for the elderly expenditures per inhabitant 80 years and above, DKK 1996	112570 (23906)
Total income (<i>TINC</i>)	The sum of private income per capita and block grants per capita, DKK 1996	90188 (14837)
The share of children 0-6 years of age (<i>CH06</i>)	The share of the population 0-6 years, January 1	0.086 (0.010)
The share of children 7-15 years of age (<i>CH715</i>)	The share of the population 7-15 years, January 1	0.115 (0.015)
The share of elderly 67 years and above (<i>EL67+</i>)	The share of the population 67 years and above, January 1	0.135 (0.033)
The share of elderly 80 years and above (<i>EL80+</i>)	The share of the population 80 years and above, January 1	0.037 (0.012)
Population size (<i>POP</i>)	Total number of inhabitants, January 1	18826 (36482)
The share of socialists (<i>SOC</i>)	The share of socialist representatives in the local council	0.514 (0.146)
Female work participation (<i>FWORKP</i>)	The share of women 20-44 years that is employed	0.772 (0.046)

Unweighted averages based on data for all 275 local governments during the period 1989-1996.

References

- Borge, L.-E. and J. Rattsø, 1995, Demographic shift, relative costs and the allocation of local public consumption in Norway, *Regional Science and Urban Economics*, 25, 705-726, also in: J. Rattsø, ed., 1998, *Fiscal federalism and state-local finance: The Scandinavian perspective* (Edward Elgar, Cheltenham) 71-92.
- Borge, L.-E., J. Rattsø and R. Sørensen, 1995, Local government service production : The politics of allocative sluggishness, *Public Choice* 82, 135-157, also in: J. Rattsø, ed., 1998, *Fiscal federalism and state-local finance: The Scandinavian perspective* (Edward Elgar, Cheltenham) 256-278.
- Brueckner, J. and M. Joo, 1991, Voting with capitalization, *Regional Science and Urban Economics* 21, 453-467.
- Brunner, E. and E. Balsdon, 2004, Intergenerational conflict and the political economy of school spending, *Journal of Urban Economics* 56, 369-388.
- Craig, S.G. and R.P. Inman, 1986, Education, welfare and the 'new' federalism: State budgeting in a federalist public economy, in: H.S. Rosen, ed., *Studies in state and local public finance* (The University of Chicago Press, Chicago) 187-222.
- Cutler, D., D. Elmendorf and R. Zeckhauser, 1993, Demographic characteristics and the public bundle, *Public Finance* 48, 178-198.
- Duncombe, W., M. Robbins and J. Stonecash, 2003, Measuring citizen preferences for public services using surveys: Does a 'grey peril' threaten funding for public education? *Public Budgeting and Finance* 23(1), 45-72.
- Fernandez, R. and R. Rogerson, 2001, The determinants of public education expenditures: Longer-run evidence from the states, *Journal of Education Finance* 27, 567-584.
- Gradstein, M. and M. Kaganovich, 2004, Aging population and education finance, *Journal of Public Economics* 88, 2469-2485.
- Grob, U., and S.C. Wolter 2005, Demographic change and public education spending: A conflict between young and old?, Working Paper No. 1555, CESifo, Munich.
- Grossman, G. and E. Helpman, 1998, Intergenerational redistribution with short-lived governments, *Economic Journal* 108, 1299-1329.
- Harris, A.R., W.N. Evans and R.M. Schwab, 2001, Education spending in an aging America, *Journal of Public Economics* 81, 449-472.
- Holtz-Eakin, D., 1992, Elections and aggregation: Interpreting econometric analyses of local government, *Public Choice* 74, 17-42.
- Holtz-Eakin, D., M.E. Lovely and M.S. Tosun, 2004, Generational conflict, fiscal policy, and

economic growth, *Journal of Macroeconomics* 26, 1-23.

Inman, R.P., 1978, Testing political economy's 'as if' proposition: Is the median voter really decisive?, *Public Choice* 33, 45-65.

Kempkes, G., 2007, Rapid demographic changes and the allocation of public education resources: Evidence from East Germany, Mimeo, Department of Business Management and Economics, Dresden University of Technology.

Ladd, H. and S. Murray, 2001, Intergenerational conflict reconsidered: County demographic structure and the demand for public education, *Economics of Education Review* 20, 343-357.

Lotz, J., 1991, Controlling local government expenditures: The experience of five European countries, in: R. Prudhomme, ed., *Public finance with several levels of government*, Proceedings of the 46th Congress of the International Institute of Public Finance (Foundation Journal Public Finance, Hague) 249-262.

Lotz, J., 1998, Local government reforms in the Nordic countries, theory and practice, in: J. Rattsø, ed., *Fiscal federalism and state-local finance: The Scandinavian perspective* (Edward Elgar, Cheltenham) 19-28.

Lotz, J. and S. Aagesen, 1997, Does demographic change cause changes in local government expenditure?, Mimeo, Ministry of Finance, Copenhagen.

Mouritzen, P-E, 1991, *Den politiske cyklus (The political cycle)* (Politica, Aarhus).

Poterba, J., 1997, Demographic structure and the political economy of public education, *Journal of Policy Analysis and Management* 16, 48-66.

Poterba, J., 1998, Demographic change, intergenerational linkages and public education, *American Economic Review* 88, 315-320.

Schwab, R. and W.E. Oates, 1991, Community composition and the provision of local public goods: A normative analysis, *Journal of Public Economics* 44, 217-237.

Strömberg, D., 1998, Demography, voting, and local public expenditures: Theory and evidence from Swedish municipalities, Mimeo, Institute of International Economic Studies, Stockholm University, Stockholm.

CESifo Working Paper Series

for full list see www.cesifo-group.org/wp

(address: Poschingerstr. 5, 81679 Munich, Germany, office@cesifo.de)

- 2160 Stergios Skaperdas and Samarth Vaidya, Persuasion as a Contest, December 2007
- 2161 Morten Bennedsen and Christian Schultz, Arm's Length Provision of Public Services, December 2007
- 2162 Bas Jacobs, Optimal Redistributive Tax and Education Policies in General Equilibrium, December 2007
- 2163 Christian Jaag, Christian Keuschnigg and Mirela Keuschnigg, Pension Reform, Retirement and Life-Cycle Unemployment, December 2007
- 2164 Dieter M. Urban, Terms of Trade, Catch-up, and Home Market Effect: The Example of Japan, December 2007
- 2165 Marcelo Resende and Rodrigo M. Zeidan, Lionel Robbins: A Methodological Reappraisal, December 2007
- 2166 Samuel Bentolila, Juan J. Dolado and Juan F. Jimeno, Does Immigration Affect the Phillips Curve? Some Evidence for Spain, December 2007
- 2167 Rainald Borck, Federalism, Fertility and Growth, December 2007
- 2168 Erkki Koskela and Jan König, Strategic Outsourcing, Profit Sharing and Equilibrium Unemployment, December 2007
- 2169 Egil Matsen and Øystein Thøgersen, Habit Formation, Strategic Extremism and Debt Policy, December 2007
- 2170 Torben M. Andersen and Allan Sørensen, Product Market Integration and Income Taxation: Distortions and Gains from Trade, December 2007
- 2171 J. Atsu Amegashie, American Idol: Should it be a Singing Contest or a Popularity Contest?, December 2007
- 2172 Patricia Apps and Ray Rees, Household Models: An Historical Perspective, December 2007
- 2173 Ben Greiner, Axel Ockenfels and Peter Werner, The Dynamic Interplay of Inequality and Trust – An Experimental Study, December 2007
- 2174 Michael Melvin and Magali Valero, The Dark Side of International Cross-Listing: Effects on Rival Firms at Home, December 2007
- 2175 Gebhard Flaig and Horst Rottmann, Labour Market Institutions and the Employment Intensity of Output Growth. An International Comparison, December 2007

- 2176 Alexander Chudik and M. Hashem Pesaran, Infinite Dimensional VARs and Factor Models, December 2007
- 2177 Christoph Moser and Axel Dreher, Do Markets Care about Central Bank Governor Changes? Evidence from Emerging Markets, December 2007
- 2178 Alessandra Sgobbi and Carlo Carraro, A Stochastic Multiple Players Multi-Issues Bargaining Model for the Piave River Basin, December 2007
- 2179 Christa Hainz, Creditor Passivity: The Effects of Bank Competition and Institutions on the Strategic Use of Bankruptcy Filings, December 2007
- 2180 Emilia Del Bono, Andrea Weber and Rudolf Winter-Ebmer, Clash of Career and Family: Fertility Decisions after Job Displacement, January 2008
- 2181 Harald Badinger and Peter Egger, Intra- and Inter-Industry Productivity Spillovers in OECD Manufacturing: A Spatial Econometric Perspective, January 2008
- 2182 María del Carmen Boado-Penas, Salvador Valdés-Prieto and Carlos Vidal-Meliá, the Actuarial Balance Sheet for Pay-As-You-Go Finance: Solvency Indicators for Spain and Sweden, January 2008
- 2183 Assar Lindbeck, Economic-Social Interaction in China, January 2008
- 2184 Pierre Dubois, Bruno Jullien and Thierry Magnac, Formal and Informal Risk Sharing in LDCs: Theory and Empirical Evidence, January 2008
- 2185 Roel M. W. J. Beetsma, Ward E. Romp and Siert J. Vos, Intergenerational Risk Sharing, Pensions and Endogenous Labor Supply in General Equilibrium, January 2008
- 2186 Lans Bovenberg and Coen Teulings, Rhineland Exit?, January 2008
- 2187 Wolfgang Leininger and Axel Ockenfels, The Penalty-Duel and Institutional Design: Is there a Neeskens-Effect?, January 2008
- 2188 Sándor Csengödi and Dieter M. Urban, Foreign Takeovers and Wage Dispersion in Hungary, January 2008
- 2189 Joerg Baten and Andreas Böhm, Trends of Children's Height and Parental Unemployment: A Large-Scale Anthropometric Study on Eastern Germany, 1994 – 2006, January 2008
- 2190 Chris van Klaveren, Bernard van Praag and Henriette Maassen van den Brink, A Public Good Version of the Collective Household Model: An Empirical Approach with an Application to British Household Data, January 2008
- 2191 Harry Garretsen and Jolanda Peeters, FDI and the Relevance of Spatial Linkages: Do third Country Effects Matter for Dutch FDI?, January 2008

- 2192 Jan Bouckaert, Hans Degryse and Theon van Dijk, Price Discrimination Bans on Dominant Firms, January 2008
- 2193 M. Hashem Pesaran, L. Vanessa Smith and Takashi Yamagata, Panel Unit Root Tests in the Presence of a Multifactor Error Structure, January 2008
- 2194 Tomer Blumkin, Bradley J. Ruffle and Yosef Ganun, Are Income and Consumption Taxes ever really Equivalent? Evidence from a Real-Effort Experiment with Real Goods, January 2008
- 2195 Mika Widgrén, The Impact of Council's Internal Decision-Making Rules on the Future EU, January 2008
- 2196 Antonis Adam, Margarita Katsimi and Thomas Moutos, Inequality and the Import Demand Function, January 2008
- 2197 Helmut Seitz, Democratic Participation and the Size of Regions: An Empirical Study Using Data on German Counties, January 2008
- 2198 Theresa Fahrenberger and Hans Gersbach, Minority Voting and Long-term Decisions, January 2008
- 2199 Chiara Dalle Nogare and Roberto Ricciuti, Term Limits: Do they really Affect Fiscal Policy Choices?, January 2008
- 2200 Andreas Bühn and Friedrich Schneider, MIMIC Models, Cointegration and Error Correction: An Application to the French Shadow Economy, January 2008
- 2201 Seppo Kari, Hanna Karikallio and Jukka Pirttilä, Anticipating Tax Change: Evidence from the Finnish Corporate Income Tax Reform of 2005, January 2008
- 2202 Walter Krämer and André Güttler, On Comparing the Accuracy of Default Predictions in the Rating Industry, January 2008
- 2203 Syed M. Ahsan and Panagiotis Tsigaris, The Efficiency Loss of Capital Income Taxation under Imperfect Loss Offset Provisions, January 2008
- 2204 P. Mohnen, F. C. Palm, S. Schim van der Loeff and A. Tiwari, Financial Constraints and other Obstacles: Are they a Threat to Innovation Activity?, January 2008
- 2205 Sascha O. Becker and Mathias Hoffmann, Equity Fund Ownership and the Cross-Regional Diversification of Household Risk, January 2008
- 2206 Pedro R. D. Bom and Jenny E. Ligthart, How Productive is Public Capital? A Meta-Analysis, January 2008
- 2207 Martin Werding, Ageing and Productivity Growth: Are there Macro-level Cohort Effects of Human Capital?, January 2008

- 2208 Frederick van der Ploeg and Steven Poelhekke, Globalization and the Rise of Mega-Cities in the Developing World, February 2008
- 2209 Sara Biancini, Regulating National Firms in a Common Market, February 2008
- 2210 Jin Cao and Gerhard Illing, Liquidity Shortages and Monetary Policy, February 2008
- 2211 Mathias Kifmann, The Design of Pension Pay Out Options when the Health Status during Retirement is Uncertain, February 2008
- 2212 Laszlo Goerke, Tax Overpayments, Tax Evasion, and Book-Tax Differences, February 2008
- 2213 Jun-ichi Itaya and Heinrich W. Ursprung, Price and Death, February 2008
- 2214 Valentina Bosetti, Carlo Carraro and Emanuele Massetti, Banking Permits: Economic Efficiency and Distributional Effects, February 2008
- 2215 Assar Lindbeck, Mårten Palme and Mats Persson, Social Interaction and Sickness Absence, February 2008
- 2216 Gary E. Bolton and Axel Ockenfels, The Limits of Trust in Economic Transactions - Investigations of Perfect Reputation Systems, February 2008
- 2217 Hartmut Egger and Peter Egger, The Trade and Welfare Effects of Mergers in Space, February 2008
- 2218 Dorothee Crayen and Joerg Baten, Global Trends in Numeracy 1820-1949 and its Implications for Long-Run Growth, February 2008
- 2219 Stephane Dees, M. Hashem Pesaran, L. Vanessa Smith and Ron P. Smith, Identification of New Keynesian Phillips Curves from a Global Perspective, February 2008
- 2220 Jerome L. Stein, A Tale of Two Debt Crises: A Stochastic Optimal Control Analysis, February 2008
- 2221 Michael Melvin, Lukas Menkhoff and Maik Schmeling, Automating Exchange Rate Target Zones: Intervention via an Electronic Limit Order Book, February 2008
- 2222 Raymond Riezman and Ping Wang, Preference Bias and Outsourcing to Market: A Steady-State Analysis, February 2008
- 2223 Lars-Erik Borge and Jørn Rattsø, Young and Old Competing for Public Welfare Services, February 2008