The Democratic Costs of Fiscal Federalism How Citizens Hold Local Governments Accountable by Exiting^{*}

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Abstract

Fiscal federalism—particularly the delegation of authority to local governments to decide on the allocation of resources—is often assumed to enhance democratic accountability, because citizens can 'vote with their feet' by moving to local governments that match their preferences. Using data on all residents' moves between Denmark's 98 local governments from 2007 to 2021 and a government-dyad fixed effects model, we show that citizens actually do react to differences in local governments' spending on various service areas by moving. However, we also show that elder citizens react much less than younger citizens, creating inequality in how much local governments are held accountable towards different groups of citizens. We discuss these democratic costs of fiscal federalism.

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1 Introduction

A fragmented local tier of government allows mobile citizens a choice of which municipality they want to live in. If political authority is delegated to the local level and service levels vary, citizens can choose which political system they would like to be part of, and what mix of tax and services they prefer. Tiebout (1956) argued that this system can lead to more efficient provision of public services. Citizens are able to sort themselves into jurisdictions offering services that they prefer, and decision-makers are held accountable, because citizens can 'vote with their feet' by moving (Tiebout 1956; Banzhaf and Walsh 2008).

However, despite continued interest in the Tiebout-model, little research has directly tested whether citizens actually respond to local governments' service spending and tax levels when moving. In a new study from Denmark, Eshaghnia, Heckman, and Razavi (2023) show that parents choose neighborhoods based on some aspect of school quality, which also confirms previous results from the US (Black 1999), France (Fack and Grenet 2010), and UK (Gibbons, Machin, and Silva 2013) showing that school quality is reflected in housing prices. These studies do not directly test the effect of public expenditure, though. Actually, results indicate that parents (and house prices) react to other quality dimensions than expenditure, not least peer composition (Abdulkadiroğlu et al. 2020; Rothstein 2006). Studies on citizens' knowledge about spending and tax levels in their local government show that they know litte about it in both Denmark (Bækgaard 2023) and the US (Teske et al. 1993; Warshaw 2019). Yet, even if citizens do not know the level of spending, they may indirectly acquire that information from various sources, including rumors about the quality of the service level within the local governments they consider when about to move. This means that it is still unclear whether citizens react to changes in public spending when moving.

We focus on how citizens move to other local governments in response to differences in expenditures. Using administrative register data on all movements between municipalities in Denmark for 15 years (2007–2021), we show in a local government-dyad fixed effects model that differences in spending on different service areas (child care, schooling, elder care, road maintenance and others) affect which local governments citizens choose to move to. We also show that the political incentives to respond to citizens' preferences created by these movements are very unequal. Whereas younger citizens move a lot and drive the average effects of spending differences, older citizens move very little and do not react to differences in spending; not even spending on elder care. These results support a Tiebout-model in which citizens (partly) choose local governments based on their personal preferences (Tiebout 1956).

The results are important for two reasons: First, they are relevant to understanding a classic question in the literature on fiscal federalism, namely whether and how citizens respond to policy by 'voting with their feet' (Tiebout 1956). We find that they do respond, but that groups do so to a different extent. Second, the results point to a democratic problem of decentralization of local government. Since specific groups of citizens are much more likely to move, politicians face strong incentives to tailor policies to their preferences, and not to groups that are less likely to respond by moving.

This may also motivate national governments to interfere in local governments' affairs in order to compensate. Central interference is not necessarily a subjugation of local democracy; it also makes sense to see it as a correction of a democratic cost of fiscal federalism. Namely, that there are substantial differences in how much different groups respond to local allocation of resources, and central government interference may be understood as attempts to safeguard the interests of citizens that have fewer opportunities to hold local governments accountable by moving between local governments.

2 Theory

2.1 Do citizens react to public spending levels?

Research on local government has seen a surge in new studies with better data and stronger designs. According to a review, three important findings stand out: First, turnout at local elections is low and dominated by homeowners, the wealthy, and the elderly. Secondly, electoral accountability is weak. Voting behavior does only weakly relate to policies. Thirdly—in somewhat contrast to the two first findings— Democratic politicians enact more liberal policies than Republican ones, and such that policies in the local governments tend to reflect the composition of their electorate, despite low turnout and little electoral accountability (Warshaw 2019).

One reason for this may be that citizens hold local government accountable not (only) by voting at elections, but also by "voting with their feet" (Tiebout 1956), i.e. moving to local governments that match their preferences in terms of spending. The Tiebout model of local government and fiscal federalism may also explain why representative institutions do not seem to moderate the degree of representation in local governments (Tausanovitch and Warshaw 2014).

Yet, there is very little evidence of whether citizens actually react to local policies when moving between jurisdictions. Earlier studies showed an association between the degree of fragmentation of local government and levels of spending, which might indicate a Tiebout effect (Teske et al. 1993). However, the micro foundations of the theory was questioned, especially because many studies demonstrated that citizens have rather little knowledge about the level of expenditures and taxes (Teske et al. 1993). Indeed, a recent survey experiment from Denmark shows that citizens have little accurate knowledge about the tax level in their local municipality, and if informed about it, they change their attitudes (Bækgaard 2023). Teske et al. (1993) argued, though, that not all citizens need to hold local elected officials accountable by moving, it may be enough that the marginal citizens that move (for one or another reason) react to service levels.

Rather than studying antecedents of Tiebout sorting such as knowledge about taxes and expenditures, a more direct way would be to examine whether local expenditures affect citizens' choice of municipality when moving. Yet, as far as we can see there is still this day very little evidence about whether politically decided service levels influence the selection of local governments when citizens move, and if so what type of services affect moving decisions the most. Furthermore, given that the assumption of a local government market without friction is unrealistic, we need information on whether different groups of citizens react differently to spending areas. Some spending areas have all citizens as a target group (such as road maintanance), others have more or less narrow target groups (such as elder care or special needs education). At the same time, life cycle (Rossi 1980, p. 226) or age (Fischer and Malmberg 2001) are decisive for the propensity to move, and this implies that accountability and incentives to adapt local policies to citizens' concerns may be very different for age groups.

2.2 Economic and Democratic Consequences of Fiscal Federalism

Fiscal federalism involves vertical delegation of powers from the state level to the local level of government (Musgrave 1959; Oates 1972), and allows each citizen to pick "that community which best satisfies his preference pattern for public goods" (Tiebout 1956, p. 418). The basic argument in favor of fiscal federalism is that the central government has less information about the preferences and needs of citizens than local governments across the country. And even to the extent that central government possesses the information, it cannot tailor services to preferences of citizens located in different parts of the country.

Following this reasoning, fiscal federalism has both an economic and a democratic rationale. The economic rationale builds on the idea that decentralization can increase allocative efficiency because it allows local governments to provide the mix of services and taxes that fits best with the preferences of citizens. Decentralized government also facilitates competition. When citizens can choose between different local governments, simply by deciding where to live, the local governments are faced with competitive pressures (Oates 1968; Oates 1972, p. 11). Fiscal federalism builds on Tiebout's (1956) model suggesting that in a system with multiple municipalities, citizens will move to the local government that best matches their preferences. This 'voting with their feet' creates a competitive pressure on the local governments incentivizing them to be responsive

to the preferences of the tax payers. Importantly, the model assumes that citizens are fully mobile, have full knowledge of services and taxes in local governments, that a large number of municipalities exist, no restrictions due to employment, and no externalities, and that citizens will sort themselves into jurisdictions with policies matching their preferences. Some of these assumptions are clearly not fully met (some groups of citizens are not mobile), and we return to the implications of this when discussing heterogeneous effects.

Fiscal federalism and decentralization to local government also has a democratic rationale (Dahl and Tufte 1973; Gerring and Veenendaal 2020). Participation and influence will, for most citizens, be minimal in very large entities and trivial in small (Dahl 1970, p. 374). Hence, Dahl (1970) sees democracy as a set of Chinese boxes of political entities nested within each other. The local level is "a unit for educating citizens in civic virtue" and the place where citizens "can acquire confidence and mastery of the arts of politics" (Dahl 1970, p. 388). The smaller size of local government affects many standard indicators of democracy (Swianiewicz et al. 2022, p. 165), including turnout (Denters et al. 2014; Lapointe, Saarimaa, and Tukiainen 2018; Bhatti and K. M. Hansen 2019), internal political efficacy (Lassen and Serritzlew 2011; Denters et al. 2014), and external political efficacy (Denters et al. 2014; S. W. Hansen 2013). These two rationales, the economic and democratic, are powerful arguments for organizing a state with lower tiers of government, such as local governments, and to decentralize service provision (Treisman 2007; Boadway and Shah 2009).

Given Teske et al.'s (1993) argument about the marginal citizen, it is likely that citizens' access to 'voting with their feet,' the very feature of fiscal federalism that can secure these economic and democratic benefits, is unequal by nature. The fact that citizens can relocate gives local decision-makers a strong incentive to be responsive. However, they have a stronger incentive to be responsive towards mobile citizens. Therefore, one of the democratic virtues of fiscal federalism—holding local governments accountable by relocating—may create unequal democratic influence across more and less mobile social groups, such as age cohorts. This is strongly at odds with the democratic ideal of equal opportunity to influence politics (Dahl 1989). A democratic system should not only ensure that citizens have similar formal rights to influence political decisions, it should also secure equal opportunity for citizens to actually affect them (Dahl 1989, pp. 114–15).

Despite the widespread use of the principles of fiscal federalism, there is very little empirical evidence on whether citizens actually hold politicians accountable by reacting to their spending decisions when moving between local governments. Even less empirical evidence exist on whether social groups differ in terms of the extent to which they hold local governments accountable. In the next section we explain how we use a local government-dyad fixed effects model on movements between municipalities in Denmark over 15 years (2007–2021) to estimate the effects of relative spending levels for different service areas on relocations from one local government to another, and how these effects differ for age groups.

3 Methods

3.1 Context

Danish local government is an essential part of the welfare state. The municipalities provide most public services and are responsible for more than half of total Danish public expenditure, corresponding to about a quarter of the GDP. They are multipurpose units, governing welfare services such as elementary schools, day care, elder care, children with special needs, culture, labor market activities in addition to technical services such as roads and administration. This means that local government is also highly important to citizens. The quality and availability of municipal services directly affect citizens, although, of course, in different ways.

Danish local government consists of 98 municipalities with an average size of about 55,000 citizens (Lassen and Serritzlew 2011). They are governed by city councils elected every four years. The city councils elect a mayor, and govern the different services,

typically with standing committees responsible for broad sectors such as children and education, elder care and social benefits, culture, and technical and environmental issues. The municipalities are all responsible for the same set of services, but they differ in how they prioritize and organize them. Spending varies considerably.

Table 1 shows an overview of the eight different municipal services. Culture and road maintanence may benefit all citizens. Schools, day care, and elderly care are three politically salient areas, benefiting quite large and well-defined groups of citizens. Schools and day care institutions are crucial to families with children of age below 16. Elderly care service is important for people with a need for care due to old age (for a minority due to disabilities). Services for children with special needs target much smaller groups of citizens but may be vital for families with children and young people in the target groups. Similarly selective is the target group for labor market activities, which affect unemployed persons. Finally, spending on administration is not directly affecting individual citizens, and is sometimes portrayed in the public as unnecessary red tape.

3.2 Statistical model

We analyze how citizens' decision to move to another local government is related to budgetary decisions made by the politicians, through the following government-dyad fixed-effect model:

$$Y_{(i,j),t} = \gamma_{(i,j)} + \delta_t + \beta' X_{(i,j),t-1} + \lambda' Z_{(i,j),t-1} + \epsilon_{(i,j),t}, \qquad i, j = 1, \dots, 98, \quad i \neq j, \quad (1)$$

where (i, j) denotes a dyad consisting of local government *i* and *j*. The total number of dyads equals $98 \times 97 = 9506$. The dependent variable, $Y_{(i,j),t}$, is defined as the percentage of the population in local government *i* that moved to local government *j* during year *t*. The parameters $\gamma_{(i,j)}$ denote dyad fixed-effects capturing all time-invariant characteristics that affect the decision of moving from local government *i* to local government *j*. Time

Users	Service Area	Description
All citizens		
	Culture	Culture and leisure activities, including parks, sport centers, libraries etc.
	Roads	Local road maintenance
Large groups of citizens		
Children below school age	Day care	Day care institutions available for a small user payment for all municipal citizens
Citizens of age 6–16	Schools	Public elementary schools from $0-10$ th grade are available for free for all municipal citizens
Citizens with need for care, par- ticularly elderly and disabled citizens	Elder care	Personal and practical aid based on citizens' needs, including personal care, cleaning, and preventive care, delivered at citizens' homes or at nursing homes. Aid at home is provided for free, and residents pay rent at nursing homes
Smalle groups of citizens		
Children and young people (typically of age 0–22) with spe- cial needs	Children with special needs	Support for children and young people with a broad range of special needs, including psychological disor- ders, disabilities, social problems, drug abuse. Service includes counseling, economic support, an residential accommodation
Unemployed citizens	Labor market	Support for unemployed, including job placement and benefits for uninsured
No direct users		
	Administration	Administration of local government and municipal institutions

Table 1: SERVICE AREAS

fixed-effects are captured by the δ -parameters and measures the overall trend in the moving behavior between local governments.

The vector $X_{(i,j),t-1}$ consists of expenditures differences between the local governments in a given dyad. More precisely, this vector is defined as

$$X_{(i,j),t-1} = E_{j,t-1} - E_{i,t-1},$$

where $E_{i,t-1} = (E_{1,i,t-1}, \ldots, E_{8,i,t-1})'$ is the vector of expenditures per capita in local government *i* in year t-1 for each of the eight service areas listed in Table 1. In our main specification we measure expenditures in year t-1, i.e., in the year prior to the year that we measure movements $(Y_{(i,j),t})$. The parameters of interests are thus collected in the vector $\beta = (\beta_1, \ldots, \beta_8)'$, which measures how sensitive moving behavior is to expenditure differentials in the considered dyads. To account for additional factors that influences the decision to move beyond the level of expenditures in service areas, we include a vector of dyad-specific control variables denoted by $Z_{(i,j),t-1}$. This vector is also specified as the level difference in local government j and i for each of the variables that we include here. The error terms, $\epsilon_{(i,j),t}$, are assumed to be mean zero and allowed to be correlated over time within each dyad. Thus for inference purposes, we compute standard errors clustered at the dyad level.

Identifying a causal effect of spending differences on moving patterns is difficult because of the potential for a reverse effect of moving patterns on spending. In particularly, it is obviously possible that local governments react to an influx of citizens by increasing spending. For instance, more families with school children will require more classes and teachers, and thus higher spending. This will again lead to a positive correlation between moving patterns on spending. We use three strategies to to mitigate reverse causality issues. First, and most importantly, the dyad fixed-effects model ensures that general patterns of movement from one municipality to another are controlled for, at we only exploit variation in movements within the dyads and variation in spending within the dyads. Second, as described above, we use one-period lagged values for both X and Z. This approach ensures that, at time t, the variables on the right-hand side of (1) cannot be caused by the dependent variable. Thus, we estimate the effect of spending differences in time t - 1 on moving patterns in time t. Third, as a robustness test we show the results of lags for 1-5 years as well as leads for 1-5 years in Table A.17.

We also note that we use spending per capita and not total spending as our expenditure measure. While it is highly likely that moving patterns affect total spending, leading to a positive correlation between citizen influx and spending, this problem does not apply to spending per capita. Spending per capita can be seen as a measure of the service level or efficiency of the service. Although local governments are likely to adjust total spending according to moving patterns, they are not likely to increase *service levels* as a response to an influx of citizens. In fact, it would seem more likely that local governments would reduce spending per citizen, reflecting economies of scale and that it may be hard to allocate more resources when the number of citizens increase. Hence, whenever we find a positive correlation between movements and spending levels, this may be a conservative estimate.

3.3 Data

Table A.1 in the appendix presents details on the chart of accounts which is mandatory for all local governments to use and therefore comparable across municipalities and across time. Figures A.1–A.5 in the appendix show substantial variation in expenditure levels across local governments in some service areas such as schools and labor market activities and much less in areas such as roads and culture.

We join the expenditure data, X, with data on the number of citizens moving from each municipality to each of the other municipalities each year from 2007 to 2021, Y. The data on movements are divided into subgroups based on age.

The control variables, Z, include data on socioeconomic, demographic, and economic conditions at the dyad level. The set of socioeconomic variables includes six variables related to aspects such as educational attainment, unemployment rates, the share of non-Western immigrants, and crime rates. The demographic variables contain four variables related to population size and density, as well as the share of commuters. Lastly, the economic variables contain information on housing prices, tax income, tax rate, and the share of house owners. All the data are publicly available at www.statistikbanken.dk and www.noegletal.dk.

4 Results

Table 2 presents the parameter estimates from the regression model in Equation (1). Model 1 is without control variables. Model 2 includes the socioeconomic variables, model 3 further includes the set of demographic variables, and model 4 includes the full set of control variables. We see that the coefficients are very robust across these three model specifications. All estimates are consistently in the same direction and significant (or insignificant) across the four models, with one exception for spending on Day Care, where the estimate is not significantly different from zero in model 1, but significant in models 2, 3, and 4.

The table shows that expenditure differences do predict which municipalities are chosen when citizens move. For all service areas with all or large group of citizens as target groups, relatively higher spending increases the likelihood that citizens move from one municipality to another. This applies to spending on Culture, Roads, Day Care, and Schools. The only exeption from this patern is Elder Care, which is the only area where spending and moving patterns are not related. For service areas targeting minor groups of citizens or with no specific target groups, increased spending is associated with citizens less likely to choose that municipality. This goes for spending on Children with special needs, Labor market activities, and Administration. The R² numbers show that only a minor part in the variation in movements between local governments are explained by the differences in spending in these models.¹

We take this as evidence that expenditure policy matters for moving patterns, conforming with one of the foundations of the Tiebout model (Tiebout 1956). Although it is difficult to rule out reverse causality entirely, the analyses show the effects of lagged variables, i.e. of spending in year t - 1 on moving patterns in year t. In Figure A.17 we show the results of the main specification with a lag of one year (Table 2, model 4) along with lags of 2-5 years, a model with no lag and leads of 1-5 years. If spending differences causally and positively affect moving patterns, we would expect to observe positive estimates in the model with a one year lag, with the estimates decreasing as

¹Table A.2 in the appendix shows separate regressions for each of the spending categories. Coefficients are with two expections stronger (i.e., more positive or more negative) in these model than in the full model in Table 2, model 4, but they are generally in the same direction and with the same levels of significance. The exceptions are Culture and Day Care. Here, the coefficients are insignificant in the simple model (Table A.2 model 3) but significantly positive in the full model. This suggests that spending on culture and daycare is negatively correlated with some of the other service areas, and that they dominate the influence of spending on culture. Therefore, the full model in Table 2 provides a more correct picture of the effect of spending on culture when controlling for spending on the other areas.

the lags increase and for increasing leads. Panel (a) in Figure A.17 shows the results for the four services with a positive association between spending and moving patterns. We see (reproducing the results in Table 2) positive effects in year t-1. For three of the services, we see that the estimates are generally lower for higher lags, and for leads. Schools stand out as an exception. Here, the estimates are stable, and tend to increase for higher leads of the variable. This implies that we the association between spending on schools and moving patterns might (at least partly) be caused by an effect of moving patterns on spending. Panel (b) shows the results for the three areas where spending differences are negatively related to moving patters. Except for Labor Market Activities, we find again strongest negative effects for the lag of one year. For higher lags, the estimates tend to be smaller, and for leads, they approach zero. For Labor Market Activities the estimates are negative also for leads, indicating that we should as for Schools be careful to interpret the correlation as evidence of a causal effect of spending in this service area. Finally, panel (c) of Figure A.17 shows lags and leads for Elder Care. We find that spending is not associated with moving patterns for lags, and small negative correlations for leads. This indicates citizens do not respond to spending differences in this service area. However, we see some indication that local governments spend less on the elderly (per capita), when they see an influx of citizens.

4.1 Effects for different age groups

In Figure 1, we present the parameter estimates with associated 95% confidence intervals of the eight expenditure categories, when we estimate the model in equation (1) separately for six distinct age-groups (0–5 years; 6–14 years; 15–19 years; 20–29 years; 30–59 years; 60+ years). The figure shows considerable differences across age groups and service areas. The first four plots (a-d) show the age profile for the service areas with an overall positive effect of spending on moving patterns. Two areas, Child Care and Schools seem to be particularly important to younger age groups. For Day Care, we see a large and statistically significant for those the 20–29 years old. For schools, we see

	(1)	(2)	(3)	(4)
Culture	1.415^{*} (0.566)	1.787^{**} (0.584)	1.876^{**} (0.589)	$\frac{1.614^{**}}{(0.576)}$
Roads	3.758^{**}	2.975^{**}	2.970^{**}	2.439^{**}
	(0.661)	(0.587)	(0.556)	(0.539)
Day Care	-0.123	1.216^{**}	1.333^{**}	1.050^{**}
	(0.400)	(0.407)	(0.397)	(0.389)
Schools	0.823^{**}	0.484^{*}	0.448^{*}	0.438^{*}
	(0.265)	(0.220)	(0.204)	(0.200)
Elder Care	$0.133 \\ (0.106)$	-0.142 (0.125)	-0.043 (0.106)	-0.130 (0.111)
Children With Special Needs	-1.613^{**}	-1.615^{**}	-1.827^{**}	-1.048^{**}
	(0.334)	(0.325)	(0.371)	(0.354)
Labor Market Activities	-1.720^{**}	-0.920^{**}	-0.780^{**}	-0.922^{**}
	(0.258)	(0.186)	(0.188)	(0.188)
Administration	-1.329^{**}	-1.210^{**}	-1.216^{**}	-1.033^{**}
	(0.294)	(0.288)	(0.300)	(0.289)
Observations R ² Dyad Fixed-Effects Time Effects Socioeconomic variables Demographic variables Economic variables	133084 0.0353 ✓ ✓	133084 0.0423 ✓ ✓ ✓	133084 0.0715 ✓ ✓ ✓ ✓	133084 0.0742

Table 2: Relative spending and choice of municipality

Notes: The table shows... ** p < 0.01, * p < 0.05, + p < 0.10.

significant, or marginally significant, effects for age groups 15–19, 20–29, and 30–44.² These results, of course, make sense given that these age groups are more likely to use Day Care institutions and Schools. The two other areas, Culture and Roads, seem to enjoy broad popularity across age groups. Again, this makes sense, since these services can be enjoyed my all age groups.

The following three plots (e–g) show the age specific estimates for service areas where spending is negatively related to moving patterns. For these service areas the effects are primarily driven by specific age groups. The estimates are negative and statistically significant for 30–44 for Administration; 30–59 for Children with Special Needs; and for 20–59 for Labor Market Activities. Taken together, many of the differences can be interpreted by the self-interest of demographic groups. Spending on Day Care and School attract groups that are likely to use these services. At the same time these age

 $^{^{2}}$ For 15–19 the estimate is significant at the 0.05-level, and for 20–29 and 30-44 at the 0.1-level

groups seem to avoid municipalities with higher spending on competing minority groups such as children with special needs and young people outside the labor market. Finally, for Elder Care, where the overall estimate suggest that spending is not related to moving patterns, we see that the estimates are close to zero and statistically insignificant (except for 15–19 years, where we observe a positive effect).

However, self-interest does not seem to be the only explanation of the results. We notice that coefficients for the group of 60 years and older are very small for all areas, even for elder care. A second part of the explanation therefore most likely relate to the mobility of the age groups. Figure 2 illustrates very different levels of mobility. It shows the percentage of movers from each municipality to each of the other municipalities for age group 20–29 years (panel 2a) and 60+ years (panel 2b). Appendix figures A.9–A.16 show the moving behavior for the full sample as well as for each of the age groups. It is clear from the figure that the younger age group moves much more between municipalities than the older age group does. Therefore, this may be the second part of the explanation of the results in Figure 1: Not all age group move equally much and therefore differences in expenditures between municipalities do not affect all age groups equally much. However, when they move, they seem to react in accordance with their self-interests.

In the discussion section we consider the implications of these results for the uneven accountability pressure that local governments face vis-a-vis different age groups.

4.2 Robustness

One concern about the main results may be that they are driven by very small municipalities with unusual high levels of spending in some areas. Indeed, Figure A.8 in the appendix shows that the four smallest municipalities (less than 7,000 inhabitants on four islands Fanø, Læsø, Samsø, and $\mathcal{E}rø$) have higher expenditures per capita on administration probably because of the lack of economy of scale. The absolute number of movement to and from these islands is also small compared to other municipality dyads.



Figure 1: RESULTS BY AGE GROUPS

Notes: This figure illustrates parameter estimates for the components of β in the model described in (1). When estimating the model for specific age groups, we have data only from 2008 to 2021, whereas in the full model, we utilize data spanning from 2007 to 2021. The vertical lines represent 95% confidence intervals around the parameter estimates.

Figure 2: Average moving behavior between municipalities

(a) Age group 20–29 years, 2008–2021

(b) Age group 60+ years, 2008–2021



Notes: The figure shows average moving behavior from each of the local governments on the x-axis to each of the local governments on the y-axis. The local governments are sorted according to their geography-based identification numbers, which explains the pattern showing most movements to and from local governments in the same geographical regions. The four marked horizontal lines in Panel a suggest that many adults in the age group 20-29 years move to the larger cities in Denmark: København (Copenhagen), Aarhus, Odense, and Aalborg. Name of the municipalities can be seen in the appendix Figures A.9–A.16

Therefore, in Table A.3 we condition the sample on the most connected dyads with mobility above 10% (models 1–4) and dyads with mobility above the median (models 5–8). The results are similar to the main results in Table 2 in terms of sign and level of significance for the coefficient. In fact, coefficients tend to be stronger when conditioning on the dyads with high mobility.³ It is reassuring that the main results are not driven by small municipalities with little mobility.

To further examine the interplay between the dyad connections and their relative of spending levels, Table A.4 presents a model in which we interact each of the spending categories with the average level of mobility within each dyad (across the time periode). The results show that the average effects found in Table 2 are driven by the high-mobility dyads: The negative coefficients for administration, children with special needs, and labor market activities become more negative the higher the mobility. The positive coefficients

³One exception is the School spending area which becomes insignificant four of the models, and significant at the 0.1 level in two models. Coefficients are about the same as in the main model, but standard errors are about twice as large in the models restricting the sample to the 50% dyads with highest level of mobility.

for roads and schools become more positive the higher the mobility. Differences compared to the main model relate to culture, which is insignificant in the interaction model.

We also note that the \mathbb{R}^2 in the interaction model is no less than 23%. This supports the interpretation that differences in spending levels may not make citizens move to another local government. However, when the marginal citizens (Teske et al. 1993) are about to move to one of the local governments that are mostly connected to their home town, relative spending levels between these governments do seem to influence their decisions thereby creating an accountability pressure on the local governments.

5 Discussion

We have found that citizens' moving patterns respond to local government policies. Politically decided service levels influence *where* citizens move, if they move. Relatively higher spending on day care, schools, roads, and culture attracts more citizens, while higher spending on administration, labor market activities, and children with special needs tends to repel citizens. This lends credibility to one of the basic assumptions behind the Tiebout model: Citizens do react to local government spending. The effects are heterogeneous (and we return to why this is important below), and differences in local spending is but one of several factors that shape moving decisions, but some do respond. With Teske et al.'s (1993) argument in mind—that it is not necessary that every citizen is fully mobile, but only that the marginal citizen is affected by differences in local policy—this is good news for proponents of fiscal federalism and decentralization of decision-making authority to a fragmented local tier of government. When citizens respond to policy differences between local governments by voting with their feet, two types of economic effects may follow. First, the sorting effect. When citizens move to local governments that offer policies matching their preferences, the result is Tiebout-sorting. If citizens have a menu of different tax-service packs to choose from, and if they move according to their preferences, service preferences among citizens will in time vary less within local governments than between local governments. This

again can give higher allocative efficiency. Second, the competition effect. The possibility that citizens may relocate in response to undesired policies means that decision-makers are faced with a competitive pressure. If they fail to deliver what citizens want, it is likely that citizens will tend to move away. This creates incentives for being responsive to the preferences of the tax payers. Competition between local governments may then lead to better and more efficient policies, and more accountability.

However, we also find heterogeneous effects: Citizens do not respond in the same way to spending on different policy areas, and, at least as importantly, the propensity to respond is widely different for age groups. Some of the differences between policy areas could seem a bit puzzling. On the one hand it may be easy to understand why spending on day care and public schools attracts citizens, due to the incidence of costs and benefits. Using Wilson's (1973, p. 331) policy typology, the benefits of spending on these services are concentrated and crucial, as anyone with children of or below school age will know, while the costs are distributed among all tax payers. School and day care policy falls with Wilson's "clientelist politics". These kinds of programs can facilitate action from the affected groups, and one of these actions could be the decision to move if other municipalities have something better to offer. However, this cannot explain why spending on elder care is not associated with net moving between local governments. This service is also clientelist in the sense that benefits are concentrated and costs are distributed. An even more dramatic deviation from the logic of this policy typology is that spending on children with special needs has a negative effect on moving patterns. Relatively better service here is associated with citizens less likely to select the municipality. These differences between policy areas give decision-makers incentives to focus on some rather than other areas. Our results suggest that this could easily be to the benefit of areas such as normal education at the expense of services such as special education. However, clearly something is missing. The characteristics of the service areas cannot explain these differences. The key here is probably the other heterogeneity in the effects of relative spending on moving patterns, that mobility varies dramatically among groups of citizens.

Younger citizens are much more likely to move (Rossi 1980). We can observe this in our data, and it is also an almost "universal pattern" (Fischer and Malmberg 2001, p. 357). Particularly the age groups 20-29 and to some extent 30-44 are very likely to move between municipalities, even quite long distances. So is—as a natural consequence the group of children and adolescents. Moving is far less likely for older age groups. This may explain why spending on elder care is not associated with moving patterns. Digging further into the heterogeneous effects for cohorts, it becomes clear that the large effect of spending on schools and day care is driven by the those who are likely to use the services. This makes sense: The concentrated benefits of public schools fall on this group, and they are very mobile. For elder care, there is no effect for any age group. Younger cohorts get no direct benefit from spending on elder care. Older cohorts do, but they are not mobile. The result is that spending on elder care is not associated with moving patterns. Finally, spending on roads and culture has a positive effect on most age groups. This may reflect that these services benefit citizens regardless of age. Conversely, spending on children with special needs have negative effects. This may reflect that this service benefits a small group of citizens.

Turning to the democratic effects of fiscal federalism, it is a classic argument that delegation of political power to local tiers of government as a supplement to national democratic institutions affects many aspects of democracy. In particular, political participation may be easier and more accessible for more citizens. These effects are generally related to the "voice" aspect of political participation (Hirschman 1970). However, there is also an "exit" option. In a fragmented local government system, citizens can choose to move, or to vote with their feet, if they are dissatisfied, or if they see a more attractive policy somewhere else. Both voice and exit should lead to political responsiveness. However, the access to voting with the feet is inherently unequal. Mobile citizens, with easy access to jobs, and with financial resources, are much more likely to move. We find that effects of policy differences on moving patterns is heterogeneous for age groups, and we also find that this has predictable consequences for how political decision-makers are rewarded for policy changes. Again, spending on public schools attracts citizens; spending on elder care and child care does not, and spending on children with special needs repels citizens. We suspect that this will have real effects on service levels for these different groups. And we see this as a democratic cost of fiscal federalism, because this inequality in leverage over politicians is so closely tied to socio-demographic characteristics. One implication to draw from this is that decentralization of political authority has complex and many-sided consequences, both for economic and democratic outcomes. Just as the economic effects are double-sided (increased competition and allocative efficiency vs potential diseconomies of scale), decentralization may one the one hand hold promise for democratic participation, but on the other hand lead to unequal political influence due to differences in mobility across groups of citizens.

The finding may also have implications—admittedly more speculative—for how we should understand central government interference in local government. A fragmented local government allows citizens to relocate in response to policies that they do not like. This confers economic benefits (Tiebout 1956) but it can also function as a control mechanism. The idea that federal institutions and checks and balances can help curtail undue influence of "factions," which Madison describes in Federalist Papers no. 10 as "a number of citizens, whether amounting to a minority or majority of the whole, who are united and actuated by some common impulse of passion, or of interest, adverse to the rights of other citizens, or to the permanent and aggregate interests of the community" (Hamilton, Madison, and Jay 2009, p. 48), also applies to local government. Citizens can go away if they do not like the policy, but some citizens more than others, and this may affect local policy.

Hence, all systems require some control. In a fragmented system of local government, the factions' of mobile citizens may get disproportionate influence, and a state level or federal level may be required to fix this problem. As per Madison's analysis, factions may have disproportionate influence, if they are not kept in check. At the local level, such control can come from higher levels of government, either at the state or federal level. Federalism is not always "layered" in the sense that different tiers of government never interfere in other tiers. A better description is marble cake federalism, where it is hard to demarcate the boundaries between responsibilities at the federal, state, and local level (Grodzins 1966, p. 8). Grodzins sees American marble cake federalism as this mildly "chaotic," and this is a strength, because it adds another set of checks and balances. At the local level it is a necessity, because no service can be delivered at the local level without implications for the wider society (Grodzins 1966, p. 323-4).

Perhaps central government interference in local matters can be seen in the light of this. Central government routinely interferes in local and regional government (T. Hansen and Klausen 2002; Hooghe, Marks, and Schakel 2010). Much to the frustration of locally elected representatives, what is formally a local prerogative is sometimes trumped by substantive and procedural rules set by central government, or subject to control or legal recourse. This interference seems to counter the very idea of delegating the responsibility for resource allocation from the state level to the local level of government (Musgrave 1959; Oates 1972). Why is central government so often disposed to change or control what local governments do? Perhaps (part of) the answer can be found in the democratic cost of fiscal federalism associated with inequality in citizens' ability to respond to policy by moving, and hence different incentives for politicians to tailor policies to their needs. Central interference in local government may—at least sometimes—be a corrective to the biases that can arise from the unequal access citizens have to voting with their feet.

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A Supplementary Information

A.1 Information on spending categories

Variable	Measurement
Culture	Municipal net current expenditures for culture and leisure activities per capita (including parks, sport centers and grants for cinemas and theaters and local clubs). Following account numbers are used pre-reform: $0.20, 0.21, 0.22, 0.23, 0.24, 0.30, 0.31, 0.32, 0.33, 0.34, 0.35, 3.50, 3.60, 3.61, 3.62, 3.63, 3.64 and 3.70 - 3.78. Post-reform: 0.28.20, 0.32.31, 0.32.35, 3.32.50, 3.35.60, 3. 35.61, 3.35.62, 3.35.63, 3.35.64 and 3.38.70 - 3.38.78$
Roads	Municipal net current expenditures for road maintenance per capita, excluding snow clearing. Income from parking bills are not included from 2008 and onward (registered separately in the accounting system from 2008). Following account numbers are used pre-reform: 2.01, 2.03, 2.05, 2.09 and 2.11. Post-reform: 2.22.01, 2.22.03, 2.22.05, 2.22.11 and 2.22.12
Day care	Municipal net current expenditures for day care per 0-5 year old. Following account numbers are used pre-reform: 5.10, 5.11, 5.12, 5.1, 5.14 (estimated share for the 0-5 year old), 5.17, 5.18 and 5.19. Post-reform: 5.25.10, 5.25.11, 5.25.12, 5.25.1, 5.25.14 (estimated share for the 0-5 year old), 5.25.17, 5.25.18, 5.25.19, 3.22.09 and 3.22.16
Schools	Municipal net current expenditures for public primary and lower secondary schools per 6-16 year old, including compulsory grants for pupils in private schools. Following account numbers are used pre-reform: 2.32, 3.01, 3.02, 3.03, 3.04, 3.05, 3.07, 3.08, 3.10, 3.12, 3.49, 5.14 (estimated share for the 6+ year old), 5.15 and 5.16. Post-reform: 3.22.01, 3.22.02, 3.22.03, 3.22.04, 3.22.05, 3.22.06, 3.22.07, 3.22.08, 3.22.10, 3.22.12, 3.22.14, 3.22.18, 5.25.14 (estimated share for the 6+ year old), 5.25.15 and 5.25.16
Elder care	Municipal net current expenditures for elder care per $65+$ year old. Following account numbers are used pre-reform: 5.32, 5.34, 5.54 (group 02-07,20,91,93), 5.92, 5.94 (grp. 11).Post-reform: 5.32.32 (excluding grp. 002, 003), 5.32.33 (excluding grp. 004 (til 2012: grp. 003)), 5.32.34, 5.32.35 (excluding grp. 001-004, 008, 091), 5.32.37, 5.22.07 (grp. 008 (from 2012)), 5.57.76
Children with special needs	Municipal net current expenditures for children and young people with special needs per 0-22 year old. Following account numbers are used pre-reform: 5.20, 5.21, 5.23 and 5.24. Post-reform: 5.28.20, 5.28.21, 5.28.23, 5.28.24 and 5.22.07 (grp. 002-005 (from 2012))
Labor market	Municipal net current expenditures for labor market activities per capita (including income transfers, excluding services for insured unemployed). Following account numbers are used pre-reform: 3.45, 5.01, 5.04, 5.05, 5.41, 5.60, 5.61, 5.65, 5.67, 5.68, 5.69, 5.71, 5.91, 5.92, 5.98. Post-reform: 3.30.45, 3.38.77, 5.46.60, 5.46.61, 5.46.65, 5.48.67, 5. 48.68, 5. 48.69, 5.48.70, 5.57.71, 5.57.72, 5.57.73, 5.57.74, 5.57.75, 5.57.76, 5.57.77, 5.58.80 (excluding grp. 004, 005), 5.58.81, 5.68.90, 5.68.97, 5.68.98
Administration	Municipal net current expenditures for administration per capita. Expenditures for administrative and political organization in main account 6 Administration and common tasks. More specifically the final accounts for account numbers 6.42.40, 6.42.41, 6.42.42, 6.45.50, 6.45.51, 6.45.53, 6.45.54, 6.45.55, 6.48.60, 6.48.61, 6.48.62, 6.48.63, 6.48.66, 6.48.67 and 6.48.68. Expenditures for elections, staff pensions and wage funds not included. Expenditures for amalgamation committees in 2006 not included

Table A.1: SERVICE AREA AND ACCOUNTS

Notes: Data are available from Statistics Denmark at www.statistikbanken.dk, table REG100. The categorization of spending into different policy areas is based on Blom-Hansen et al. (2016) with some adaptations.



Figure A.1: EXPENDITURE: CULTURE



Figure A.2: EXPENDITURE: ROADS



Figure A.3: EXPENDITURE: DAY CARE



Figure A.4: EXPENDITURE: SCHOOLS



Figure A.5: EXPENDITURE: ELDER CARE



Figure A.6: EXPENDITURE: CHILDREN WITH SPECIAL NEEDS



Figure A.7: EXPENDITURE: LABOR MARKET ACTIVITIES



Figure A.8: EXPENDITURE: ADMINISTRATION

A.2 Moving behavior between municipalities



Figure A.9: Average moving behavior, 2007–2021



Figure A.10: Average moving behavior in age group 0–5 years, 2008–2021



Figure A.11: Average moving behavior in age group 6–14 years, 2008–2021



Figure A.12: Average moving behavior in age group 15–19 years, 2008–2021



Figure A.13: Average moving behavior in age group 20–29 years, 2008–2021



Figure A.14: Average moving behavior in age group 30–44 years, 2008–2021



Figure A.15: Average moving behavior in age group 45-59 years, 2008-2021



Figure A.16: Average moving behavior in age group 60+, 2008–2021

A.3 Supplementary Analyses

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Administration	-1.365^{**} (0.285)							
Children With Special Needs		-1.967^{**} (0.354)						
Culture			$\begin{array}{c} 0.290 \\ (0.521) \end{array}$					
Day Care				$0.494 \\ (0.333)$				
Elder Care					0.081 (0.103)			
Labor Market Activities						-1.782^{**} (0.270)		
Roads							3.841^{**} (0.670)	
Schools								0.598^{**} (0.222)
Observations R ² Dyad Fixed-Effects Time Effects Socioeconomic variables Demographic variables Economic variables	133084 0.0295 ✓	133084 0.0299 ✓ ✓	133084 0.0289 √ √	133084 0.0289 ✓ ✓	133084 0.0289 ✓	133084 0.0325 √ √	133084 0.0299 √ √	133084 0.0292 ✓ ✓

Table A.2: REGRESSION RESULTS: INCLUDING EACH EXPENDITURE CATEGORY ONE AT A TIME

Notes: The table shows... ** p < 0.01, * p < 0.05, + p < 0.10.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Administration	-1.315^{**} (0.334)	-1.240^{**} (0.331)	-1.221^{**} (0.336)	-0.960^{**} (0.323)	-1.693^{**} (0.575)	-1.674^{**} (0.568)	-1.622^{**} (0.559)	-0.978^+ (0.531)
Children With Special Needs	-1.864^{**} (0.406)	-1.857^{**} (0.394)	-2.042^{**} (0.423)	-1.122^{**} (0.405)	-3.270^{**} (0.747)	-3.065^{**} (0.699)	-3.444^{**} (0.718)	-2.287^{**} (0.692)
Culture	1.722^{**} (0.650)	1.980^{**} (0.660)	2.086^{**} (0.662)	1.733^{**} (0.652)	3.204^{**} (1.131)	2.917^{**} (1.108)	3.092^{**} (1.104)	2.605^{*} (1.092)
Day Care	-0.084 (0.459)	1.242^{**} (0.475)	1.226^{**} (0.458)	0.887^{*} (0.447)	-0.386 (0.844)	1.808^{*} (0.836)	1.699^{*} (0.800)	$1.078 \\ (0.790)$
Elder Care	$0.179 \\ (0.124)$	-0.133 (0.142)	-0.064 (0.127)	-0.169 (0.132)	-0.024 (0.225)	-0.348 (0.243)	-0.278 (0.226)	-0.522^{*} (0.232)
Labor Market Activities	-1.868^{**} (0.289)	-0.933^{**} (0.206)	-0.789^{**} (0.208)	-0.937^{**} (0.208)	-2.508^{**} (0.463)	-1.159^{**} (0.339)	-1.009^{**} (0.336)	-1.269^{**} (0.338)
Roads	4.304^{**} (0.807)	3.273^{**} (0.720)	3.194^{**} (0.677)	2.489^{**} (0.666)	6.902^{**} (1.437)	5.282^{**} (1.281)	$4.984^{**} \\ (1.200)$	4.170^{**} (1.182)
Schools	0.813^{**} (0.301)	$0.393 \\ (0.249)$	0.438^+ (0.232)	0.450^{*} (0.227)	$0.986^+ \\ (0.511)$	$0.383 \\ (0.427)$	0.421 (0.394)	$\begin{array}{c} 0.554 \\ (0.385) \end{array}$
Observations R ² Dyad Fixed-Effects Time Effects Socioeconomic variables Demographic variables Economic variables	119770 0.0386 √ √	119770 0.0461 ✓ ✓	119770 0.0758 ✓ ✓ ✓	119770 0.0788 ✓ ✓ ✓	66542 0.0655 ✓	66542 0.0732 ✓ ✓	66542 0.1021 ✓ ✓ ✓	66542 0.1066 ~ ~ ~ ~

Table A.3: REGRESSION RESULTS: INCLUDING ONLY MUNICIPALITY DYADS WITH HIGH MOBILITY

Notes: The table shows... ** p < 0.01, * p < 0.05, + p < 0.10. Columns 1–4 includes dyads with mobility above the 10% quantile, and columns 5–8 includes dyads with mobility above the median.

	(1)	(2)	(3)	(4)
Administration	$0.383 \\ (0.323)$	0.410 (0.320)	0.604^+ (0.330)	0.753^{*} (0.334)
Children With Special Needs	0.274 (0.283)	$0.159 \\ (0.284)$	0.599^+ (0.306)	1.230^{**} (0.331)
Culture	$0.025 \\ (0.523)$	-0.204 (0.555)	-0.260 (0.568)	-0.383 (0.574)
Day Care	-0.256 (0.413)	$0.030 \\ (0.440)$	-0.056 (0.439)	-0.187 (0.438)
Elder Care	0.486^{**}	0.412^{**}	0.285^{*}	0.265^{*}
	(0.110)	(0.115)	(0.117)	(0.117)
Labor Market Activities	1.190^{**}	1.292^{**}	1.264^{**}	1.204^{**}
	(0.144)	(0.141)	(0.148)	(0.147)
Roads	-1.552^{**}	-1.401^{**}	-1.373^{**}	-1.694^{**}
	(0.507)	(0.512)	(0.485)	(0.497)
Schools	-0.483^{*}	-0.358^+	-0.403^{*}	-0.408^{*}
	(0.188)	(0.194)	(0.199)	(0.197)
Dyad Average \times Administration	-0.018^{*}	-0.018^{*}	-0.018^{*}	-0.017^{*}
	(0.008)	(0.008)	(0.008)	(0.008)
Dyad Average \times Children With Special Needs	-0.026^{**}	-0.026^{**}	-0.026^{**}	-0.026^{**}
	(0.008)	(0.008)	(0.008)	(0.008)
Dyad Average \times Culture	$0.014 \\ (0.014)$	$0.014 \\ (0.014)$	0.013 (0.014)	$0.014 \\ (0.014)$
Dyad Average \times Day Care	0.018^+ (0.010)	$0.018^+ \\ (0.010)$	$0.018^+ \\ (0.010)$	0.018^+ (0.010)
Dyad Average \times Elder Care	-0.003	-0.003	-0.004	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)
Dyad Average \times Labor Market Activities	-0.036^{**}	-0.036^{**}	-0.035^{**}	-0.035^{**}
	(0.003)	(0.003)	(0.003)	(0.003)
Dyad Average \times Roads	0.067^{**}	0.067^{**}	0.067^{**}	0.067^{**}
	(0.014)	(0.014)	(0.014)	(0.014)
Dyad Average \times Schools	0.009^{*}	0.009^{*}	0.009^{*}	0.009^{*}
	(0.004)	(0.004)	(0.004)	(0.004)
Observations \mathbb{R}^2	$133084 \\ 0.2159$	$133084 \\ 0.2164$	$133084 \\ 0.2187$	$133084 \\ 0.2198$
Dyad Fixed-Effects Time Effects Socioeconomic variables Demographic variables	\checkmark	\checkmark		$ \begin{array}{c} \checkmark \\ \checkmark \\ \checkmark \\ \checkmark \\ \checkmark \end{array} $

 ${\bf Table \ A.4: \ Interacting \ average \ dyad \ mobility \ with \ expenditures}$

Notes: The table shows... ** p < 0.01, * p < 0.05, + p < 0.10.

Figure A.17: Model estimation for different number of leads and lags in the independent variables



Notes: This figure illustrates parameter estimates for the components of β in the model described in (1), where we change the timing of the independent variables from t - 5 to t + 5. Filled markers indicated significance at the conventional 95% confidence level.