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# Appendix: For Online Publication

## Some More Context On Danish Municipalities

[context] There have been two large reforms of local politics in the last 50 years in Denmark. The first was conducted in 1970 as the Danish welfare state started to expand. Here the number of municipalities were reduced from more than 1000 to 275 (Ingvartsen 1991). (Although it was 277 the first two years.) The second reform was conducted in 2007 and further reduced the number of municipalities from 275 to 98. Once again, the increasing complexity of public service provision was a key argument for the reform (Christiansen and Klitgaard 2008). Since both of these reforms were comprehensive in terms of amalgamations and changes to the relative power of national ctr. local government, we let them be the bookends of our analysis, examining the relationship between citizens policy views and the ideological flavor of municipal policy between the two reforms. Because of data availability we further limit our study period, so that it goes from 1978 and 2008.

In the period we study, Danish municipalities are governed by small city councils (between 9 and 29 members) which are elected at proportional elections and with a multi-party system which, to a large extent, mirrors the party system at the national level (Blom-Hansen, Elklit, and Kjær 2009). Elections are fixed to take place every four years and do not usually coincide with elections at the national or EU level. Before 1981 elections always took place in the spring, but this was changed to November so that there would be a match between calender years and election terms. To make this change there was only three years between the elections of 1981 and 1978. Turnout is high with an average of around 70 percent since 1970.

Following each municipal election, a majority in the city council elects a mayor, and the chairmen of the various committees (Serritzlew, Skjæveland, and Blom-Hansen 2008). Mayors are the only full time professional politicians in the city councils and have a number of formal obligations (Kjaer 2015). Mayors are also responsible for the day-to-day business of the administration and chairs the important economic committee which sets taxes and the budget. The work in the city council is structured by a a number of committees. The number and size of the committees is determined by the council. Committee membership is allocated proportionality between the political parties which means that there is broad political representation in all committees. The committees can decide on matters in their area and the administrative responsibility across areas is therefore essentially divided.

## Overview of Policies Included in Our Measure

p5.5cmP3cmP4.5cm **Policy** & **Availabiliy (number of years)** & **Do Higher or Lower Values Imply Conservatism?**  
&&  
*Tax policy* &&  
Income tax (pct.) & 29 & Lower  
Property tax (per mille) & 29 & Lower  
Commercial real estate tax (per mille) & 14 & Lower

&&  
*Spending policy* &&  
Spending pr. capita (DKK) & 29 & Lower  
Spending pr. pupil in school (DKK) & 7 & Lower

&&  
*Organization of public service delivery* &&  
Public Employees (pr. 1,000 citizens) & 9 & Lower  
Privately operated services (pct.) & 14 & Higher  
Purchases with a private supplier (pct.) & 14 & Higher

&&  
*Co-payment for public services* &&  
Average cost of day care (DKK) & 16 & Higher  
Price of relief stay (DKK) & 7 & Higher  
Food delivery for the elderly (DKK) & 7 & Higher  
Stay in nursing home (DKK) & 7 & Higher

&&  
*Extent of Public Services* &&  
Public housing (pct.) & 14 & Lower  
Class size in public schools & 14 & Lower

## Details about Estimation of Municipal Fiscal Policy

We parameterize fiscal conservatism using the following measurement model, which allows us to estimate it across time and space:

Where is the level of the observed fiscal policy variable in municipality at time . the distribution of each of these observed variables is drawn from a normally distributed latent variable , which has variance . is the quantity of most interest – the latent fiscal conservatism in that municipality. is the discrimination parameter, which captures how strongly each observed policy variable loads onto the latent dimension. Finally, represents each item’s difficulty parameter, which measures how fiscally conservative a municipality is, if it were to score 0 on the policy variable .

This parameterization is in many ways similar to frequentist factor analysis. However, a major advantage to using Bayesian techniques when making inferences about the latent trait is that the simulations will impute missing data during the estimation, which allows us to include items with different numbers of observations in the model – the variables with missing observations will simply supply less information to the estimation. Additionally, the estimation is simulation based, which allows us to directly estimate uncertainty around all model parameters.

We include the 14 policy variables listed in table [[tab:policies]](#tab:policies) in the model. Before we do so, all variables are rescaled to have mean zero and variance one. Furthermore, all variables where higher values imply a more left-wing fiscal policy are reversed. This implies that when estimating policy conservatism, higher values on all variables indicate a more conservative policy. This is strictly speaking not necessary, but it makes interpretation of the model parameters simpler.

To identify the direction of the policy space, we constrain the ’s to be positive, so that municipalities scoring higher on our observed policy variables will be estimated to be more conservative. Location and scale is identified by placing standard normal priors on the distributions of all model parameters. All precision parameters are estimated using uninformative gamma priors.

Estimation is done by initiating a random walk over the parameter space defined by the model using the Gibbs sampler. We run 25,000 iterations of the model, where the first 2,500 are burn in. We run three parallel chains. To reduce autocorrelation within the chains of sampled values and improve convergence, we set a thinning interval of five, meaning that we only retain every fifth sampled value. This specification ensures convergence of the model and provides well-behaved, normal posterior distributions.

## Some Descriptive Features of Municipal Fiscal Policy

Figures [[fig:timeline]](#fig:timeline) and [[fig:lines]](#fig:lines) present some descriptive features of the annual measure of fiscal policy conservatism. In particular, it looks at how the measure is distributed across time and space, revealing some interesting patterns in municipal fiscal policy.

Fiscal policy conservatism dropped slightly in the period. The drops are located in ’78 to ’81 and from ’93 to 2000: periods where the Social Democratic Party was in power nationally. This makes sense as liberal national fiscal policies are likely to spill over into local politics through intergovernmental grants etc.

Aside from the national trends, however, the most notable feature of the time series seems to be the large variation we identify in fiscal policy. Some municipalities are, apparently, very fiscally conservative while others are not. Although the within-differences are less dramatic, we also see some municipalities start out more conservative and then become more liberal and vice versa.

Figure [[mostleast]](#mostleast) presents an overview of the 50 most and the 50 least conservative municipalities across the entire period. This list what most observers of Danish politics would expect. The most conservative municipalities are in Western Jutland and North of Copenhagen whereas the least Conservative (i.e., Socialist) municipalities are west of Copenhagen and in an around the other large cities (Aaalborg, Aarhus, Odense).

Distribution of Municipal Fiscal Policy Conservatism from 1978 to 2006 (densities).

Distribution of Municipal Fiscal Policy Conservatism from 1978 to 2006 (densities).

Distribution of Municipal Fiscal Policy Conservatism from 1978 to 2006 (densities).

Distribution of Municipal Fiscal Policy Conservatism from 1978 to 2006 (densities).

The Most and Least Conservative Municipalities

The Most and Least Conservative Municipalities

## Validating Our Measure Of Citizens’ Policy Preferences

In figure [[validation2]](#validation2), we gauge the extent to which it matters that our measure relies on data from municipal rather than national elections. To do this, we correlate municipal-level net support for conservative parties at the 2005 municipal election with municipal-level net support for the same conservative parties at a national election held six months earlier. This analysis reveals a strong, but in no way deterministic, correlation of 0.56. Accordingly, we might miss meaningful variation, if we used election returns from national, rather than local, elections to estimate local policy preferences.

To get an indication of how well our electoral measure capture voters underlying preferences, we look at the 2013 Danish Municipal Election Survey (Elklit, Elmelund-Præstekær, and Kjær 2017). In this survey, more than 30 respondents (avg. 46) from each municipality were asked to place themselves on an eleven point ideology scale going from left to right. We calculate the municipality-specific mean of these responses and correlate these with the municipality-specific net support for conservative parties in the 2013 municipal election. As can be seen from figure [[validation1]](#validation1), the two are strongly correlated, which suggests that we are in fact tapping into relevant variation in policy views, when we measure citizens preferences over parties. Further, its important to note that the correlation is biased downwards, because we have random measurement error in our sample based measure of policy views. The reader should also note that due to the municipal reform of 2006 (see section [[context]](#context)) we can only have 98 observations corresponding to the 98 (amalgamated) municipalities.

How strongly correlated are the electorate’s preferences at municipal and national elections? Data from the 2005 municipal and national elections.

How strongly correlated are the electorate’s preferences at municipal and national elections? Data from the 2005 municipal and national elections.

Does the electorates preference over parties reflect preferences over policy? Data from the 2013 municipal election.

Does the electorates preference over parties reflect preferences over policy? Data from the 2013 municipal election.

## Regression Table for Main Results

In Table [[main\_res]](#main_res) we report a regression table summarizing numerically the same information as the coefficient plot in the main text does graphically. Columns one through four use as the dependent variable the full measure of fiscal conservatism, while the remaining four columns use the reduced measure, which only include spending pr. capita, as well as taxes in income and property. All models include population size (logged) as a control. Column one shows the result from the pooled model, while column two includes twoway fixed effects. In the third column, we interact the time fixed effects with dummies for region and the log of population size. Finally, column four uses the first difference of all variables in the model instead of demeaning by municipality. Columns five through eight replicates these models with the reduced measure of fiscal policy conservatism.

[main\_res]

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [-1.8ex] |  |  |  |  |  |  |  |  |
| [-1.8ex] |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| [-1.8ex] |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| [-1.8ex] | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|  |  |  |  |  |  |  |  |  |
| [-1.8ex] Right Vote | 0.416 | 0.129 | 0.145 |  | 1.110 | 0.317 | 0.335 |  |
|  | (0.059) | (0.037) | (0.048) |  | (0.122) | (0.081) | (0.099) |  |
|  |  |  |  |  |  |  |  |  |
| FD Right Vote |  |  |  | 0.065 |  |  |  | 0.143 |
|  |  |  |  | (0.038) |  |  |  | (0.085) |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| [-1.8ex] Municipality FE? | No | Yes | Yes | No | No | Yes | Yes | No |
| Municipality FD? | No | No | No | Yes | No | No | No | Yes |
| Time FE? | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Time X covariates? | No | No | Yes | No | No | No | Yes | No |
| Observations | 1,908 | 1,908 | 1,908 | 1,363 | 1,908 | 1,908 | 1,908 | 1,363 |
| R | 0.057 | 0.874 | 0.924 | 0.672 | 0.071 | 0.843 | 0.914 | 0.869 |
| Adjusted R | 0.056 | 0.853 | 0.906 | 0.670 | 0.070 | 0.816 | 0.893 | 0.869 |
|  |  |  |  |  |  |  |  |  |
| [-1.8ex] |  |  |  |  |  |  |  |  |

## Are Changing Socio-demographics Driving Our Results?

In Table [[tab:balance]](#tab:balance), we show how the electoral support for right-wing parties relates to changes in municipal socio-demographics. None of the correlations are strong. The largest coefficient is on percentage of college educated, where we estimate that an increase of one percentage point is related to a decrease in support for right-wing parties of approximately 1/20 of a standard deviation. Unsurprisingly, with these low correlations, we cannot reject the null that the coefficients individually nor collectively are zero. Besides this, it should be noted that the model’s overall explanatory power is very low, as indicated by the negative adjusted .

Support for Right-Wing Parties and Socio Demographics.

|  |  |
| --- | --- |
| [-1.8ex] |  |
| [-1.8ex] |  |
|  |  |
| [-1.8ex] | Electoral Support for Right-Wing Parties |
|  |  |
| [-1.8ex] Education | 0.007 |
|  | (0.005) |
|  |  |
| Immigrants | 0.0001 |
|  | (0.0001) |
|  |  |
| Unemployed | 0.003 |
|  | (0.002) |
|  |  |
|  |  |
| [-1.8ex] Wald Stat | 2.22 |
| Municipality? | Yes |
| Year FE? | Yes |
| Observations | 818 |
| Adjusted R | 0.500 |
|  |  |
| [-1.8ex] |  |

## Does Fiscal Policy Affect Voter Preferences?

As an additional test of reverse causality, we use the lag of municipal policy as the explanatory variable in a series of fixed effects models predicting electoral support for right-wing parties. We use one through four year lags and report the result of each of these models in [[fig:granger]](#fig:granger). All coefficients are small, and in none of the models we can reject the null that municipal policy does not predict voter behavior. This strengthens our claim that voter preferences explain policy and not the other way around.

Reverse Causality? Fiscal Conservatism does not predict future support for Right-Wing parties. Confidence intervals are 95 percent, computed using robust standard errors clustered at the municipality level.

Reverse Causality? Fiscal Conservatism does not predict future support for Right-Wing parties. Confidence intervals are 95 percent, computed using robust standard errors clustered at the municipality level.

## Is it Just The Mayoralty?

There are two important reasons why we would expect municipal policy to be responsive to voter preferences. First, when the electorate chooses to elect more right-wing candidates, we would expect them to enact more fiscally conservative policies. Second, we might observe that parties are differentially responsive to voter preferences. We investigate these mechanisms in Figure [[fig:mech]](#fig:mech).

In panel A, we include a categorical control for whether the mayoral party is the Liberal Party, the Social Democrats, or some third party. In doing so, we condition the effect of electoral support for right-wing parties on, whether those parties control the most important municipal policy-making position. This gives us the effect of support for right-wing parties among the voters after taking into account, which politicians they elect. Identifying the direct effect of electoral support net of selection by including a post-treatment control in this way requires very strong assumptions that are unlikely to be met **REFERENCE**. Still, it is striking how little the coefficient on the policy preferences of the electorate changes, when controlling for the mayoral party. Additionally, it is interesting that policy does not seem to be different when the mayoralty changes from one party to another.

Are Results Driven by Selection? The figure shows results after including control for the mayoral party. Baseline estimates are included for comparison.

Are Results Driven by Selection? The figure shows results after including control for the mayoral party. Baseline estimates are included for comparison.

Are All Parties Equally Responsive? The figure shows the marginal effects from a model including an interaction between mayoral party and electoral support for right-wing parties.

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In panel B, we allow the effect to vary across our three different categories of mayoral party. The differences in the estimates are very small, and we cannot reject that policy under all three mayoralties respond equally to voter preferences.

## Effects on Individual Policy Indicators

As our measure of municipal policy is made up of many different fiscal policies, it is interesting to investigate, which factor(s) drive the effect. To do so, we regress a four year lead of all policy items presented in Table [[tab:policies]](#tab:policies) individually on the electoral support of right-wing parties including time and year fixed effects. Figure [[fig:item]](#fig:item) present the results. While some variables are uncorrelated with voter preferences, a majority are quite strongly correlated with preferences, but the individual correlation is estimated with a lot of uncertainty. This suggests that combining the items has added value over only using one, as we reduce statistical noise in the estimation process.

Effect of Right-Wing Electoral Support Across Components of our Measure. Note that all measures of taxes and spending are reversed to capture that higher values equal more conservative policy. Confidence intervals are 95 percent, computed using robust standard errors clustered at the municipality level.

Effect of Right-Wing Electoral Support Across Components of our Measure. Note that all measures of taxes and spending are reversed to capture that higher values equal more conservative policy. Confidence intervals are 95 percent, computed using robust standard errors clustered at the municipality level.

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