

Female Representation – Is it Important for Policy Decisions?*

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Abstract

This paper studies whether the degree of female representation in Swedish local councils affects local public expenditure patterns. Theoretically, the individual preferences of elected representatives may impact public expenditure if full policy commitment is not feasible. To empirically address the question I first analyze the preferences expressed by elected local council representatives using survey data. This permits me to make precise predictions about the effects of female representation on spending. The subsequent panel study on the composition of public spending in Swedish municipalities supports the predictions derived from the survey.

Keywords: Political representation; Local public expenditure; Gender; Survey data; Panel data

JEL Classification: C23, C25, D78, H40, J16

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1. Introduction

Do all groups have to be represented in elected assemblies for their interests to be taken into account? In the public debate this is often claimed to be the case. Yet if political representation is necessary for having one's interests taken into account, it is implicitly assumed that the elected representative, at least to some degree, can pursue his or her own interests. Women are often referred to as an under-represented group in elected assemblies. In the year 2000, e.g., only two out of nine national parliament members worldwide were women (Norris (2001)). Many countries consider this to be a major problem and various strategies, including affirmative action and quotas, are aimed at boosting female representation in elected assemblies.

Theoretically, there is no clear answer as to whether the elected representative's gender is of importance for policy choices. An instance when identity is of no importance for policy choices is when political candidates and parties can commit to policy platforms ahead of the election. If politicians can commit to policy choices then electoral incentives will cause candidates to choose a policy vector preferred by a majority of voters. Typical for these models is the decisive role of the median voter (see e.g. Downs (1957)). This assumes, however, that voters and politicians are able to write down a full set of state contingent policy contracts prior to the election and that some institutions enforce these campaign promises. Elected politicians, however, always have important powers that are partly unchecked. Unbiased enforcement is rarely observed in reality. In such cases, policy choices are sensitive to the legislator's policy preferences (see e.g. Alesina (1988)).

When the electorate delegates policy decisions to political agents who are motivated by self-interest, and enforcement of electoral campaign promises is not possible, there is an agency problem between voters and their representatives (Persson et al. (2000)). Elections and political institutions may discipline political agents and if the office holder wishes to remain in office the electorate can hold the incumbent accountable for policy choices (Ferejohn (1986)). Yet politicians will still have some discretionary power over policy choices. It is therefore theoretically plausible that politicians' preferences affect policy choices; i.e. the bargaining strength of a group of politicians with similar preferences will matter for the allocation of resources.

There is also empirical evidence that the median voter model may not be an appropriate description of the political process. Levitt (1996) shows in a study of U.S senators that personal preferences have a major impact on senators' voting patterns in Congress. Moreover, several studies have shown that gender is an indicator of policy priorities. Female legislators tend to be more liberal than men and are more likely to express concerns about social policy issues (see e.g. Thomas (1991, 1994), Oskarson and Wängnerud (1995) and Setzer, Newmann and Voorhees Leighton (1997)). In a study of Swedish MPs, Esaiasson and Holmberg (1993) find that female MPs were significantly more positive towards daycare centers and an ecological society.

This study investigates if female representation shapes actual policy choices in Swedish local governments. Swedish local government is an interesting object of research since it is a representative democracy in which the budgetary process does not include a popular vote about the budget's size or content. Moreover, local governments enjoy considerable autonomy from national government. In fact, Pettersson-Lidbom (2000, 2001) finds that parties matter for spending in Swedish municipalities, implying the median voter model has limited support. Much of the empirical research on the determinants of public policy has however used the median voter model and focused on the relationship between the demographic characteristics of a political jurisdiction and the services provided by its government (see e.g. Cutler, Elmendorf and Zeckhauser (1993) and Alesina, Baqir and Easterly (1997)). This paper tries to broaden the research on the determinants of public policy by examining the impact of legislator identity on public policy.

Earlier studies of legislator identity as a determinant of policy choices include Sorensen (1995), Pande (1999), Besley and Case (2001) and Chattopadhyay and Duflo (2001). When investigating the effect of reservation policies on policy choices in India, Pande (1999) finds some results suggesting that reserved places for minorities affect targeted transfers and Chattopadhyay and Duflo (2001) find that mandatory representation for women affects local-level spending patterns. Using panel data for U.S. states, Besley and Case (2001) find that female representation increased spending on family assistance and strengthens child support. Sorensen (1995) first asks politicians what their preferences are and then investigates whether the number of politicians of a certain group has an effect on actual spending decisions. His

results are ambiguous. Thus, even if there are differences in preferences, they do not necessarily have any effect on actual policy.

Using survey data on the preferences of politicians in local governments, I first investigate if and how the preferences of men and women differ. This approach allows me to derive a set of precise hypothesis about the effects of gender on policy choices. This is of great merit: instead of postulating *à priori* in what way men and women's preferences differ, I derive clear predictions about the effect of female representation on spending from the preference study. I then analyze the actual allocation of spending in all Swedish municipalities during the period 1988-1997, taking potential dynamics and endogeneity problems into account. The results indicate that the share of women in a local council indeed has a significant effect on spending decisions. As predicted by the preference study, a larger share of women in the majority increases spending on childcare relative to elderly care. Moreover, increased female representation in those municipalities ruled by left-wing parties has a positive impact on spending on education relative to elderly care. No such effect is found in right-wing parties. At a more general level, the results indicate that legislator identity influences policy choices.

The paper is organized as follows. I first (section 2) examine the relationship between gender and preferences using survey data on the elected representatives in 28 Swedish municipalities. Then (section 3) I study the effect of female representation on actual local public expenditure in all Swedish municipalities, using the predictions derived in section two. Results are presented for both the within and GMM-estimator. Section four addresses the question of causality using an instrumental variable approach. Since causality is an important issue in this type of study the section receives considerable attention. In section five I study the effect of gender on the municipality's responses to different shocks, and finally section six concludes.

2. How do men and women's preferences differ?

To obtain predictions about the effect of female representation on policy choices, men and women's preferences need to differ in a systematic way. In order to establish possible gender differences in preferences, I employ a unique data set on the preferences expressed by elected

representatives in Swedish municipalities in 1993.¹ The study focuses on spending on elderly care, education and childcare. There are three main reasons for choosing these sectors. First of all they constitute the lion's share of municipal spending²; secondly, the availability of data is good; and thirdly, the municipalities are almost the sole providers of these services.

2.1. Data

Elected representatives in 28 municipalities (about 10 percent of the local councils) and 4 counties were asked to participate in the survey.³ Since the focus is on the local council, only respondents who are members or replacement deputies in the local council are included, leaving me with around 1035 observations. The primary purpose of the original survey was to study elected representatives' views on their political role and working routines in the local councils. However, the data collected also includes background information on gender, age, party affiliation, participation in organizations and position in the elected council. And most importantly, for my purpose, it includes the politicians' views on certain issues and in what areas they thought that the municipality should do more.

For each area, the respondent could choose from three different answers: "it is important to do more than the municipality is doing now"; "the municipality's efforts are sufficient"; or "the municipality's efforts can be reduced".⁴ The answers will be interpreted as the politicians' spending preferences for different sectors. Since municipalities in Sweden have power over the size of budget, and no budget constraint was built into the questions, it is possible that some politicians answered that the municipality should do more (or less) in all areas. To remedy this problem, differences between answers are used and ordered into five categories. For example, the variable Childcare/Elderly care will take value 1 if the politician states that more should be done in elderly care and less in childcare. It will take value 2 both if he/she indicates it is important to do more in elderly care while work in childcare is sufficient, and if

¹ The data set is handled and distributed by The Swedish Social Science Data Service at Gothenburg University. Henry Bäck, Department of Social Science, Stockholm University, originally collected the material in "Kommunalpolitikerundersökningen" 1993. Neither Swedish Social Science Data Service, nor Henry Bäck bear any responsibility for the analysis, or interpretation of the data as presented in this paper. The results of the preferences study should be representative for the period since a lack of data will restrict the following study of actual public expenditure to the ten-year period 1988-1997.

² Over 70 percent of local public spending is spent on these three sectors (www.scb.se).

³ The municipalities were chosen by the original researcher to mirror the demographic, economic and political differences across municipalities in Sweden. Female representation is slightly stronger in the municipalities included in the survey than the ones outside of the survey. However, the means are not statistically different at the 10 percent confidence level.

he/she answers that elderly care spending is sufficient and can be reduced in childcare. If the respondent states that he/she would like to do more in all areas, it will be interpreted as this person does not place higher priority on any one area in relation to another and the variable Childcare/Elderly care will take value 3, and so on.

As can be seen in the summary statistics shown in Table A:1, the mean of the variable Elderly/Child is 2.672. On average, elderly care is thus regarded as a slightly more important sector than childcare. Whenever the mean is lower than 3, the sector in the numerator is, on average, regarded as less important than the sector in the denominator. Judging by the means, politicians would like to spend more on elderly care and education, at the expense of childcare.

2.2. Results

The effects of gender on the stated preferences are examined in an ordered logit model, controlling for age, party affiliation and municipality. The results presented in Table 1 show that there is a clear effect of gender. Women, relative to men, regard childcare and education as more important sectors than elderly care. Furthermore, both age and party affiliation are clearly correlated with preferences. In comparison to right-wing politicians, left-wing politicians rank childcare as the most important area. As expected, older politicians, relative to younger ones, think that elderly care is more important than other sectors. Women in local councils are on average younger than their male colleagues are. The results, however, show that there is an effect of gender even after controlling for age. Including a dummy for each municipality does if anything strengthen the result. The dummy should pick up municipality specific factors, such as the municipality's earlier spending pattern and its age structure, that can potentially influence the politicians' preferences. Then again, regardless of where the politicians come from, gender is correlated with preferences.⁵

[Table 1 here]

⁴ See Appendix for the exact question.

⁵ The Wald statistic is always statistically significant in the samples including municipality dummies. Excluding the dummies, however, reduces its value in several specifications. In particular, the model does then not perform well in the estimations presented in Table 2, column 2, and Table 3, column 2.

The sample is then divided along party lines to check whether the effects are different in left- and right-wing parties.⁶ Table 2 and 3 present the results for left- and right-wing parties respectively. The effect of gender in left-wing parties is the same as for the total sample (see Table 1). In right-wing parties, however, women and men do not express different opinions concerning the relative importance of education contra elderly care.

[Table 2 and 3 here]

To sum up, the gender effect on the ranking of childcare verses elderly care appears to exist in both samples although the effect differs somewhat between left-wing and right-wing politicians. In left-wing parties, gender seems to affect the importance of childcare and education relative to elderly care. In right-wing parties, however, the main difference is the preference for childcare relative to the other sectors.

Due to the construction of the independent variables some variation in preferences may be lost. Specifically, some respondents may have different preferences over the two sectors but state they prefer more (or less) spending in both sectors. In that case, my variable will indicate that the respondent does not prefer any sector relative to the other, suggesting that the data fails to pick-up all the variation in preferences. To find out more about this effect I study the gender profile for those cases where the respondent prefers more (or less) spending in both sectors. Interestingly, women are overrepresented (underrepresented) as respondents preferring more (less) spending in both sectors. Thus women, relative to men, favor increased spending in all three sectors.

The study of politicians' preferences indicates certain differences between men and women. If politicians can pursue their own interests, the strength of women in the local council should be reflected in the municipalities' spending decisions. Table 4 summarizes the hypotheses that will be tested using data for actual municipal expenditures.

[Table 4 here]

⁶ Parties categorized as 'left-wing' are the Left Party and the Social Democratic Party, and 'right-wing' are the Moderate Party, the Liberal Party, the Christian Democratic Party, the Centre Party and New Democracy. This categorization follows Petersson (1992).

Notice that it would be incorrect to interpret the above result as saying that women regard, for example, childcare as the service with highest priority; what it says is that women regard childcare as more important than men do. As a matter of fact, both female and male politicians express preferences for more spending on elderly care at the expense of childcare. Thus, if the elected politicians could affect policy in accordance with these preferences it should be reflected in a trend: over time, more resources should be allocated to elderly care and education at the expense of childcare.

3. Local public spending

3.1 Object of study — Swedish local governments

Section two established a relationship between spending preferences and gender. The next step is to find out if politicians' preferences are important for actual spending. The object of the empirical study is Swedish municipal spending, which constitutes more than 40 percent of Swedish public spending. Local governments in Sweden are interesting units for study of collective choice since they enjoy significant independence from national government. In fact they have the constitutional right of self-governance. Moreover, several empirical studies have shown that they indeed act independently from national government (see e.g. Pettersson-Lidbom (2000 and 2001)). Another attractive feature is that local governments, contrary to country level studies, operate in the same political framework, i.e., politicians are likely to have roughly the same effect in all municipalities.

This study covers 278 municipalities in Sweden and spans 1988-1997.⁷ As mentioned earlier, it focuses on spending on elderly care, education and childcare. Since the preference study only provides predictions about the effects on the relative spending on different sectors, the ratios of spending will be used as dependent variables.

3.2 Specification of empirical model

⁷ It includes all municipalities except for the ones that were split or created during the period, and three municipalities with responsibilities usually handled by the county council.

Empirically, the purpose is to estimate the impact of female politicians on municipality spending patterns, while controlling for the municipality's demographic composition. This allows me to examine whether the politician's identity matters for policy choices. It can also be seen as a weak test of different political economy models: if politicians can commit to policy, then the bargaining strength of women in the local council should not affect policy decisions. With incomplete commitment, however, variations in political representation should have an effect.

How should we measure the bargaining strengths of elected representatives in local councils? One major determinant of individual representatives' bargaining strength is the structure of the decision-making process. If the ruling parties alone determine the allocation of resources, only the bargaining strength of women in the majority is important for policy decisions. I will use the share of women in the majority as one proxy for women's bargaining strength when decisions are assumed to be taken by majority parties alone. An alternative view of the decision process is that all elected representatives can affect resource allocation. This amounts to assuming that all elected representatives have some bargaining power in the budget process, possibly because they can highlight these issues in council meetings and in the media even though they are not part of the majority. In this case the share of women in the council is the appropriate proxy. The two proxies are of course highly correlated, but hopefully the two hypotheses about the decision making process can be separated empirically.⁸ Another issue is that the new assembly is gathered shortly before the following year's budget is decided upon. It is possible that the effect of increased women's representation does not show up until the next budget.

The study of politicians' preferences in section 2 clearly indicated that the representative's age is correlated with spending. Sadly, no panel data is available for the age composition of the local councils, and therefore it is not possible to analyze the effect of politician's ages on spending decisions. Since the women are younger than the men, it may lead me to falsely attribute effects on spending to gender instead of age. But even if that were to be the case, it would still mean that the identity of the politician matters for policy choices.⁹

⁸ The correlation between share of women on the council and share of women in the majority is 0.834.

⁹ There is data on the age composition of the local council available for one cross-section. Studying the effect of politicians' age on these data give conflicting result. It seems as municipalities ruled by older politicians in a left-wing majority spend less on childcare relative to elderly care. However, there is some evidence of the opposite,

When trying to explain spending on different services, one must try and control for differences in the need for the service. Since services such as childcare, education and elderly care are directed towards certain age groups, it is natural to control for demographic structure. It is also possible that large age groups can exert political pressure on the local council to spend more on a service that benefits that particular group. In a typical median voter model, for example, it is of great importance for the spending pattern which service the median voter benefits the most from (see e.g. Strömberg (1999)). When estimating the ratio of spending on childcare to spending on elderly care, for example, the following explanatory variables are used: share of population between the ages of 0-6; share of population between the ages of 65-79; and share of the population older than 80. The percentage of left-wing votes will also be included, since it is likely to affect the municipality's allocation of resources. The rationale is twofold. First, given that politicians can affect resource allocation, and that party affiliation has been shown to correlate with preferences, the bargaining strength of the party should have an effect. Second, the votes cast for left-wing parties may also reflect the preferences of the population.

An important question concerns problems of simultaneity: there may be an omitted variable, such as a community-specific preference for equality, affecting both spending decisions and female representation. The issue of possible simultaneity will be addressed below. Note, however, that voters in Sweden can not directly show their preferences for a female or male politician by voting for that candidate. In the Swedish system¹⁰, voters vote for a party list, not a candidate, and a voter has virtually no power to affect the names on the list, the order of which is decided entirely by the party. Moreover, parties on the local level have been under pressure from the national level to increase the share of women on the party list.

As mentioned earlier, the demographic composition of the electorate has also been used to describe the identity of the median voter in empirical studies. Thus, age variables pick up both cost differences and median voter effects. Female participation rates will also be included to pick up further cost differences, since the need for childcare should be greater when many women work outside of the home. Population density is included in case it affects the relative

that municipalities with older politicians increased spending on childcare and education at the expense of elderly care. Thus, the results suggest that the possible effect of gender is not likely to be due to age effects.

¹⁰ In the 1998 election, and outside the time period of this study, incremental change was introduced that for the first time enabled the electorate to vote for an individual candidate.

price of the different services. To control for further possible median voter effects, a battery of other variables will be included, such as the share of women in the population, the share of women in the population with higher education, and municipality mean income. For an overview of the variables, see their summary statistics in Table A:2. The general idea is that if policy decisions are entirely decided by the electorate, only variables describing the municipality's demographic composition should explain the spending pattern, and the composition of the local council should have no explanatory power.

According to Table 4 there are three equations to estimate, one for each spending ratio. The general specification is:

$$y_{it} = \beta z_{it} + \gamma \mathbf{X}_{it} + \lambda_t + v_i + \varepsilon_{it}$$

where y_{it} denotes a particular spending ratio in a municipality in a specific year; z_{it} the representation of women in the local council; and \mathbf{X}_{it} is the vector of control variables mentioned above. For the rest, λ_t is a time-specific effect, constant over municipalities, v_i is a municipal-specific effect, constant over time, and ε_{it} is the usual residual.

The advantage of using panel data is, of course, that we may hold constant municipality-specific and time-specific influences on spending. Municipality fixed effects control for time invariant differences across municipalities that may influence policy choices. Year effects should pick up two types of effects. First, if politicians can act according to their own preferences, the trend should comply with the politicians' average preferences. The analysis of preferences in section 2 focused on the difference between men and women. For example, women, relative to men, were found to regard childcare as a more important area than elderly care. Both men and women, however, did in fact state elderly care to be the highest priority sector. We therefore expect that over time municipalities will allocate a larger share of budget to elderly care and that the year dummies will pick up this effect. Second, the year effects will also take into account any impact on the policy outcome of common shocks to the municipalities. Examples may include changes in laws and changes in those services the municipality has to provide. Then again, the use of fixed municipality and year effects also have drawbacks; while they may correctly measure left-out variables, they may falsely cause

me to attribute changes in spending patterns to fixed effects that should be attributed to variables, such as women's representation, that vary across municipalities and time.

3.3 Results

3.3.1 Fixed effects

Table 5 presents the basic panel regressions for the full set of municipalities, using the share of women in the majority lagged one period as a proxy for women's representation. As the municipality specific effects are correlated with the explanatory variables the random effects assumption is not appropriate, which makes the within estimator the preferred estimator. According to the preference study in section 2, the effect of women's representation in the majority should affect spending on childcare and education relative to elderly care and have no impact on spending on childcare relative to education. The results indeed suggest that female representation has a positive effect on spending on childcare and education relative to elderly care. However, it also has an effect on spending on childcare relative to education, which is not in accordance with the prediction from section two.

With regards to the controls, a larger share of elderly in the population has a significant impact on spending, favoring elderly care relative to childcare and education. The demand for childcare is positively affected by women's workforce participation rate, while demand for education is positively correlated with the share of educated women in the municipality. Another interesting result is that the share of left-wing votes enters with the sign predicted in section 2. A larger share of left-wing politicians increases spending on childcare relative to elderly care and education, as does mean income, while population density and the share of women in the municipality have no impact on the relative spending levels in the three sectors.

[Table 5 here]

Is it the representation in the ruling majority or the representation in the council that is of importance for the allocation of resources? Table 6 presents the result when using the two different proxies for women's bargaining power. The coefficients for the control variables are suppressed to save space. Both proxies have an effect on spending decisions. So far, it is difficult to say anything about the decision process, i.e., if the share of women in the council

or the share of women in the majority matters for the allocation of resources. Or if the impact of changes in female representation is instantaneous or take a year to show.

[Table 6 here]

3.3.2 Dynamic specification.

Earlier studies estimating the demand for local public services in a median voter framework have typically assumed exogenous regressors and a static set-up. Dynamics may be present since the adjustment to changes in demand might be sluggish. Many of the explanatory variables may well be endogenous due to migration and other factors.¹¹ Recent work in this area has shown that regressors may well be endogenous and the adjustment process may well be sluggish (see e.g. Bailey and Connolly (1998) and Dahlberg and Jacob (2000)). When estimating a model that has endogenous regressors and/or is dynamic, the within estimator is no longer appropriate. In fact, the within estimator will be biased and inconsistent in a dynamic set-up unless the panel consists of many time periods. When estimating dynamic models one can use transformations that allow the use of lagged endogenous and predetermined variables as instruments for the transformed equations. Efficient GMM of this type are discussed in, for example, Arellano and Bond (1991) and Blundell and Bond (1998). Here I make use of the GMM system estimator described in Blundell and Bond (1998).

The results using the dynamic panel data estimator are presented in Table 7. Only the results using female representation for the previous period are displayed, since the other proxies are never statistically significant at conventional significance levels. Again, the other explanatory variables are suppressed to save space. All coefficients are from the first-step estimations, since studies have found that the second-step standard errors tend to be biased downward (see e.g. Blundell and Bond (1998)). The Sargan test of over-identifying restrictions is used to control the model specification and the validity of the instruments. Since this test tends to over-reject in the presence of heteroscedasticity, the two-step estimator should be used to evaluate the specification. The consistency of the GMM estimator hinges heavily upon the

¹¹ If there is Tiebout migration, income and demographic structure may, for example, be endogenous. In particular, Dahlberg and Jacob (2000) have shown in a study of demand for public services in Swedish municipalities that demographic variables, income and population density are not strictly exogenous. On the other hand, Ahlin and Johansson (2001) find no evidence of Tiebout sorting in a study of the demand for local public school expenditures in Sweden using survey data.

assumption of no second-order autocorrelation in the first-differences errors. Therefore, Table 7 also shows the test statistic of an AR(2) test.

In specification A all the explanatory variables are considered to be exogenous. According to the Sargan test the model is correctly specified and the instruments are valid in the two last columns but not in the first one. To remedy the problem in the first specification all regressors are treated as predetermined (specification B). Yet the result stays qualitatively the same. The results show that a significant dynamic effect is present in all specifications. Further, only female representation from the previous period seems to have any effect on spending patterns. There seems to be a positive effect of female representation on spending on childcare and education relative to elderly care. However, only the effect in the first column is statistically significant. To judge the size of the effect, consider a 10 percent increase of the share of women in the ruling majority. This leads to an immediate 0.8 percent increase in resources spent on childcare relative to elderly care while the long-term effect is estimated at 1.6 percent.

[Table 7 here]

Next, I let the impact of female representation vary across left- and right-wing majorities to investigate the hypothesis more closely. As the relative preferences between men and women differ across left- and right wing parties, the impact should differ across majorities. The results in Table 8 certainly lend more support for the hypotheses tested in this paper. As predicted, there is a positive effect of women's representation in both left- and right-wing majorities on the resources spent on childcare relative to elderly care. There is no effect on spending on childcare relative to education, and a positive effect on spending on education relative to elderly care only in municipalities ruled by a left-wing majority.¹²

[Table 8 here]

How large is the effect of female representation? Consider a municipality ruled by a left-wing majority in 1988 and with a median share of women in the majority. Assume that this municipality is still on the median in the end of the period. This means that the municipality has raised its female representation by 55.3 percent (from 31.0 to 48.1 percent women in the

majority). This implies a short-run increase of spending on childcare relative to elderly care of 4.8 percent and education relative to elderly care of 2.0 percent. The long-run effect is 9.6 percent on childcare relative to elderly care and 2.9 percent on education relative to elderly care. Another way to judge the effect is to consider a municipality with female representation at the 25th percentile a certain year and see how large the effect on spending would be if it increased female representation to the size of the 75th percentile. In 1993, for example, this experiment would entail an increase from 32.8 to 44.2 percent, i.e. a 34.8 percent increase of the share of women in the majority. The result – a direct effect of 3.0 percent and a long-run effect of 6.1 percent increase of spending on childcare relative to elderly care. Spending on education relative to elderly care would go up with 1.3 percent in the short run and by 1.8 percent in the long run.

The demographic variables enter roughly as expected in the dynamic specification. The share of left-wing votes only has a positive effect on spending on childcare relative to education and not, as in the fixed-effects estimation, on spending on childcare relative to the other sectors. Women's participation in the workforce increases spending on childcare and elderly care at the expense of spending on education. For the rest, the share of educated women, population density and mean wage have a positive effect on spending on childcare. Including dummies for left- and right-wing majorities does not alter the result. The other proxy for female representation – the share of women in the council – is never significant in GMM estimations. Thus it is the share of women in the majority that matters for the impact of female representation.

4. Causality

The question of causality naturally arises in this type of study. Is it the share of women in the local council that affects spending decisions, or is there an underlying factor that determines both? The striking result that the effect differs between municipalities governed by a left- and right-wing majority in a fashion predicted by the preference study makes the results more reliable. However, the possibility of endogeneity still remains. If endogeneity occurs through an unobservable municipality-specific effect, the problem disappears when using the within

¹² Dividing the sample by majority leads to no statistically significant results.

estimator or the GMM estimator. Thus, endogeneity may only be a problem if some time-varying variable simultaneously determines women's representation and spending decisions.

4.1. The instrument

Optimally, one would like to consider a "natural experiment" in the form of a truly exogenous change of female representation or find a variable that is correlated with women's representation but not with spending decisions.¹³ A change to the municipality that may affect female representation is a change in the number of seats in the local council. In the three elections included in this study, the probability for a nominated man to be elected was greater than for a nominated woman, as men were placed higher up on the party lists (Statistics Sweden (1999)). An increase of the number of seats is thus likely to have increased the chance of women being elected when nominated.

An increase to the number of seats may thus be a relevant instrument. But is it exogenous? Indeed it is the local councils themselves that determine the size of the councils. However, the minimum number of seats is stipulated by law and depends on the number of voters in the municipality.¹⁴ Moreover, the decision to change the number of seats must be taken before the end of March in the election year (almost 6 months before next election), and the change will be implemented the coming election period (Kommunallagen 5 Chapter 1-3 §).¹⁵

A possible problem with this instrument is that it may correlate with the demand for the different services. Growing municipalities may have an increasing share of children relatively to elderly, and thus growing demand for childcare and education relative to elderly care. On the other hand, the law only requires a larger number of seats when the number of voters (not inhabitants) in the municipality exceeds a certain threshold. And indeed, if one examines the change of municipalities' demographic composition in the period preceding the change of seats in the council there seems to be no such correlation. The change in the share of population between the age of 0-6 in the period 88-91(91-94) is not correlated with the

¹³ See Pande (1999) and Chattopadhyay and Duflo (2001) for examples of studies attempting to make use of an experiment.

¹⁴ The number of seats should be odd and at least 31 in municipalities with less than 12 000 voters, 41 in municipalities with 12 000 - 24 000 voters, 51 in municipalities with 24 000-36 000 voters, 61 in municipalities with more than 36 000 voters, and 101 in the local council in Stockholm.

¹⁵ I have asked the municipalities when the decision was taken and the answers indicate that the decision to change the number of seats often is taken between a year and 6 months before the election.

percent change of the number of seats in the local council 1992(1995). Continuing this correlation for all the age categories I find that they are all very weak. If anything, the change in the share of elderly is positively correlated and the share of school children negatively correlated with the change of seats. The instrument thus does not appear to pick up lagged changes in demand.

Another concern may be that municipalities decreasing the number of seats do so to lower spending. Thus, a change in the number of seats could be positively correlated with change in the overall budget. If the decrease in the budget hits different sector asymmetrically, the change in council seats may be correlated with spending in different sectors. However, there is no significant correlation between changes in the budget and changes of the number of seats in the council.

Since the probability of being elected once nominated was greater for men than women during this period, a sudden increase (decrease) in the number of seats should increase (decrease) the chance for women to be elected. Moreover, this effect is likely to differ across municipalities. Studies on national and international level suggest that women do best in multi-member constituencies with a high number of seats per district (Norris and Lovenduski (1995)). In the context of Swedish local councils, this would imply that a sudden change in the number of seats would have a greater impact on female representation in smaller local councils. Further, since right-wing majorities consist of up to four parties whereas left-wing majorities include only two parties, the effect should be larger in local councils with a right-wing majority. A change to the number of seats in the local council is therefore expected to have greatest impact on female representation in small local councils with a right-wing majority. In total I make use of four different instruments for the share of women in the majority: percent change of seats in; small right-wing majority; small left-wing majority; large right-wing majority; and large left-wing majority local councils. A problem is that there have not been many changes during the three election periods included in the study. When using the share of women in the majority as proxy for female representation, there are 35 (out of 879) changes in the number of seats.

4.2. Results

The results in Table 9 indicate that there is indeed an independent effect of female representation on childcare and education verses elderly care spending. Both female representation in this and in the previous period are significant.¹⁶ Compared to any previous results the point estimates are now much larger, suggesting elasticities that are from 3 to 6 times larger than before. A 10 percent increase of women in the majority leads to a long-term increase of about 5 percent increase of spending on childcare relative to elderly care. A possible explanation for this larger effect is that younger politicians may also be placed further down the party list and as a result the instrument may pick up the effect of both gender and age. If the instruments are only weakly correlated with the endogenous explanatory variable, then even a weak correlation between the instruments and the error can lead to large inconsistency in IV estimates (Bound et al (1995)). The F statistics of the instruments in the first-stage estimations, reported in Table 9, suggest that the instruments are indeed correlated with female representation. Moreover, the Hansen overidentifying test indicates that there is no problem with correlation between the instrument and the error in the original equation.

When also instrumenting for the lagged dependent variable using the techniques described in section 3.3.2 female representation is only significant on spending on childcare relative to elderly care. I have also run the same regressions using only one observation every election period (reducing the time periods to 4). Dynamics is a less present in these specifications suggesting that the lagged dependent variable can be excluded. These results support the conclusion from Table 9: Female representation has a positive exogenous effect on spending on childcare and education verses elderly care.

Since the effect of female representation should differ between right and left-wing majorities, I have also tried to divided the sample by majority. Female representation enters as predicted in right-wing majorities but the effects in left-wing majorities are not statistically significant on conventional levels. One plausible explanation is that the change of seats in the local council is a poor instrument in small left-wing majority councils. Examining the first-stage regressions more closely indicate that the effect of the change of seats in the local council on female representation is, as predicted, strongest in small right-wing local councils and

¹⁶ The other proxy for female representation, the share of women in the council, has roughly the same effect as the share of women in the majority. The results are not displayed to save space.

somewhat weaker in larger local councils. However, there seems to be no impact of a change of seats in small left-wing majority councils. Either it is a result of the limited number of changes of seats in the local councils, or the above reasoning for using the change of seats in the local council as instrument for female representation does not apply to the same degree in left-wing parties.¹⁷

[Table 9 here]

5. Response to Shocks

When ranking the municipalities according to the share of women in the local council there is little variation over time. Thus, some municipalities always have a relatively large share of women in the council and some municipalities never do. Consequently, there may be additional effects of female representation which are difficult to uncover in a fixed effects estimation since they can not be separated from other time-invariant municipality specific features. One way to uncover such hidden effects is to ask whether municipalities respond differently to similar shocks, depending on the female representation in the council. This part of the analysis focuses on expenditure on childcare relative to elderly care, since women relative to men in both left-wing and right-wing parties regarded childcare as the more important sector. Notice that this section is quite tentative and can be seen as a first attempt to look for empirical regularities rather than as formally testing a well-specified hypothesis.

5.1 Unobservable shocks

It is plausible that some shocks, political and economic events, affect all municipalities in Sweden. Examples could be changes in the municipality's responsibilities, business cycle effects and political changes in national government. Suppose that these changes are difficult to measure or cannot be observed. In a recent paper, Blanchard and Wolfers (2000) suggests

¹⁷ This can perhaps explain why there is no effect of female representation on spending on education relative to elderly care when the lagged dependent variable is instrumented for using the techniques described in section 3.3.2. If the instruments only work for right-wing majorities there should be no effect on spending on education verses elderly care because men and women's preferences did no differ across those sectors in right-wing parties.

what statistical method to use in a case like this. Persson and Tabellini (2001) use the same methodology when studying the effect of political institutions on economic policy.

Following their method I would like to estimate the specification:

$$y_{it} = \alpha + \beta z_{it} + (1 + \eta (z_{it} - z_t)) \varphi \lambda_t + \gamma X_{it} + v_i + \varepsilon_{it}$$

y_{it} denotes, as in the panel specification, the spending outcome in a municipality in a particular year, z_{it} is the proxy for women's bargaining power in the local council, X_{it} is the vector of control variables specified in section 3 and v_i is the municipality specific effect. As before, the set of year dummies are used to estimate the common effect of common events. Now, the institution specific effect of common events λ_t is proportional to $\eta (z_{it} - z_t)$ where z_t is the year average across municipalities. Thus, if municipalities with a large share of women in the ruling majority react differently to shocks the estimated coefficient η will be significant. Because of the form of the specification, η has to be estimated using non-linear least squares.

5.2 Observable shocks

Another approach is to focus on different spending responses to changes in observable variables, which should have an effect on spending decisions. Here I concentrate on demographic changes and different dynamic adjustment processes. To investigate these questions, the institutional variable – the deviation of share of women in the majority from year mean – is interacted with the demographic variables and the lagged dependent variable.

The specification becomes:

$$y_{it} = \alpha + \beta z_{it} + (\mu + \eta (z_{it} - z_t)) S_{it} + \gamma X_{it} + \lambda_t + v_i + \varepsilon_{it}$$

This is identical to the earlier expression except for S_{it} , which include the lagged dependent variable and the demographic variable. Instead of using the different age groups a new demographic variable (the number of inhabitants in the age 0-6 divided by age 65 and older (DEM)) is constructed. The coefficient η will be estimated using the fixed effects estimator.

5.3 Results

The results, presented in the two first columns of Table 10, indicate that municipalities with greater female representation respond differently to the unobservable shocks.¹⁸ Over the period all municipalities have decreased spending on childcare relative to elderly care and municipalities with a greater share of women in the local council have decreased spending even more than other municipalities. Thus, the effect of female representation goes the opposite direction to the effect found earlier in the study. This result looks interesting, but is hard to interpret without a prior hypothesis. To judge the size of the effect, consider a municipality with a share of women in the majority one standard deviation from mean. How much more did this municipality decrease spending on childcare relative to elderly care in comparison to the mean municipality? The short-term effect is 0.2 to 0.3 percent and the long-term effect is 0.3 to 0.5 percent depending on proxy for female representation. Although local governments with a larger share of women respond stronger to the unobservable negative shocks on spending on childcare relative to elderly care, the share of women in the local majority still has a positive direct impact on the spending ratio. The effect is only statistically significant in the second column.

The last two columns display the results of the effect of observable shocks. The estimates in the first specification indicate that municipalities with stronger female representation are associated with more inertia in spending than other municipalities. The results in the last column suggest that they respond more to demographic shocks. Again female representation has a positive direct impact on the spending on childcare relative to elderly care.

[Table 10 here]

The results from this section indicate that the composition of the local council can influence how they react to different types of shocks. Although the results are interesting they call for a theory that can give a direct hypothesis to take to the data.

¹⁸ In spite of the problems associated with the inclusion of a dynamic effect the lagged independent variable is included, as section 4 showed that there is a significant dynamic effect present in the data.

6. Conclusion

I have studied the question whether women's representation has any effect on the actual allocation of resources. First, this study confirms the general findings of other work that men and women's preferences differ (see e.g. Thomas (1991), Oskarson and Wängnerud (1995) and Setzer, Newmann and Voorhees Leighton (1997)). Specifically, it finds that women, compared to men, prefer more spending on childcare relative to elderly care. In left-wing parties women express a stronger preference than men for education relative to elderly care, but no such difference is found in right-wing parties. Secondly, the results show that female representation matters for the allocation of the budget, as predicted when examining the preferences. The results are summarized in Table 11. More generally, the results contradict the prediction from the Downsian model that the politician's identity, or in this case gender, should not influence policy decisions.

[Table 11 here]

The paper also provides indirect evidence on the decision process in the local council. Specifically, I employ two proxies for women's bargaining power in the local council. Most results indicate that it is the representation in the majority, rather than the whole council, that matters. Because of the high correlation between the two, other results are inconclusive. Finally, the paper makes an effort to identify non-linear effects of female representation on municipality spending. The results differ somewhat depending on proxy for female representation, but they suggest that municipalities with a large share of women in the council seem to be associated with greater inertia in spending and respond more to demographic shocks than municipalities with a lower share of women in the council.

The focus here has been on gender as a determinant of spending. Clearly, the composition of the local council in other dimensions should also have an effect on policy. For example, a municipality with older politicians is likely to spend more on the elderly *ceteris paribus*. Other characteristics, such as ethnic group and occupation may also be correlated with preferences and therefore have an impact on policy decisions. There is clearly room for further studies along similar lines.

Appendix

Question from the survey of local government politicians (Kommunalpolitikerundersökningen 1993 SSD 0459).

For each of the three sectors, childcare, education and elderly care, the respondents answered the following question:

Do you think that it is important that your municipality does more than at present, or its effort is essentially sufficient as it is, or if the municipality's effort can be reduced, or if you do not have an opinion.

- A. Important to do more
- B. Sufficient as it is
- C. Can be reduced
- D. Do not know / no opinion.

(Own translation)

Table A:1 Descriptive statistics for study in section 2

<i>Variable</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>N obs</i>
Female	0.316	0.465	1067
Age	51.185	10.006	1067
Childcare/ Elderly care	2.666	0.664	1034
Childcare/ Education	2.703	0.658	1036
Education/ Elderly care	2.960	0.653	1035

Data source: Kommunalpolitikerundersökningen 1993 SSD 0459

Table A:2. Data description and descriptive statistics for study in section 3

<i>Variable</i>	<i>Mean</i>	<i>Std.d</i>	<i>N obs</i>
Data source: Swedish Association of Local Authorities “Vad kostar verksamheten i din kommun?” 1988-1997			
Childcare /elderly care: Spending on childcare divided by spending on elderly care.	0.801	0.643	2730
Childcare /education: spending on childcare divided by spending on education.	0.469	0.123	2729
Education /elderly care: Spending on education divided by spending on elderly care.	1.668	0.999	2728
Data source: Swedish statistics (www.scb.se) “Sveriges officiella statistik”			
Women in the local council: The number of women in the local council divided by the number of seats in the local council.	0.352	0.076	2780
Women in the majority: The number of women in the majority divided by the number of seats belonging to the majority. There is a left-wing majority if SAP + VP obtains more than 50 percent of the votes and a right-wing majority if M +Fp+Kd+C obtain more than 50 percent of the votes.	0.357	0.100	2139
Left-wing votes: The share of votes cast on SAP and VP.	0.473	0.122	2780
Ages 0-6: The share of the population between 0 and 6.	0.091	0.010	2780
Ages 7-16: The share of the population between 7 and 16.	0.125	0.014	2780
Ages 17-19: The share of population between 17 and 19.	0.040	0.005	2780
Ages 65-79: The share of population between the ages 65 and 79.	0.139	0.029	2780
Ages 80 and older: The share of population older than 80.	0.047	0.013	2780
Population density: Population divided by area.	111.610	377.035	2780
Women with higher education: The number of women with three years or more of higher education divided by the population.	0.021	0.010	2780
Women in the population: The share of women in the population.	0.499	0.033	2780
Change of number of seats in the council	-0.002	0.033	2780
Data on all the above variables are from the beginning of the year.			
Data source: Swedish Statistics “Årsbok för Sveriges kommuner” 1990-2000			
Mean income: Taxable personal income per person. Deflated using KPI to 1991 years prices.	8233.9	11143.5	2780
Women’s participation rate: The share of working women age 20-64 in November.	76.121	6.037	2497

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Table 1. Politicians preferences over sectors. Ordinal logistic regression model

	<i>Childcare/ Elderly care</i>	<i>Childcare/ Education</i>	<i>Education/ Elderly care</i>
Female	0.380 ^{***} (2.73)	0.085 (0.61)	0.272 ^{**} (2.11)
Age	-0.026 ^{***} (-3.86)	0.010 (1.51)	-0.037 ^{***} (5.42)
Left-wing	0.991 ^{***} (7.37)	1.011 ^{***} (7.52)	-0.022 (-0.18)
N obs.	1034	1036	1035
Wald χ^2	141.12 ^{***}	139.11 ^{***}	92.75 ^{***}

*** Indicate statistical significance at 1%-level, ** at 5%-level and * at 10%-level. t-statistics in parentheses. All regressions include municipality dummies and are reported with robust standard errors.

Table 2. Left-wing politicians preferences over sectors. Ordinal logistic regression model

	<i>Childcare/ Elderly care</i>	<i>Childcare/ Education</i>	<i>Education/ Elderly care</i>
Female	0.372 [*] (1.71)	-0.065 (-0.29)	0.384 [*] (1.80)
Age	-0.043 ^{***} (3.49)	0.016 [*] (1.66)	-0.051 ^{***} (4.60)
N obs.	481	480	481
Wald χ^2	96.92 ^{***}	86.41 ^{***}	72.81 ^{***}

*** Indicate statistical significance at 1%-level, ** at 5%-level and * at 10%-level. t-statistics in parentheses. All regressions include municipality dummies and are reported with robust standard errors.

**Table 3. Right-wing politicians preferences over sectors.
Ordinal logistic regression model**

	<i>Childcare/ Elderly care</i>	<i>Childcare/ Education</i>	<i>Education/ Elderly care</i>
Female	0.411** (2.15)	0.291 (1.57)	0.114 (0.63)
Age	-0.016* (1.95)	0.008 (0.88)	-0.027*** (-3.00)
N obs.	553	556	554
Wald χ^2	47.13***	51.50***	67.87***

*** Indicate statistical significance at 1%-level, ** at 5%-level and * at 10%-level. t-statistics in parentheses. All regressions include municipality dummies and are reported with robust standard errors.

Table 4. Predicted effect of women's representation in local council on spending

	<i>Effect of women's representation in the local council</i>		
	Whole sample	Left-wing parties	Right-wing parties
Spending on childcare/elderly care	+	+	+
Spending on childcare/education	0	0	0
Spending on education/elderly care	+	+	0

Table 5. Basic specifications. Fixed effects estimations.

	<i>Childcare/ Elderly</i>	<i>Childcare/ Education</i>	<i>Education/ Elderly</i>
Women in the majority (-1)	0.083 ^{***} (3.89)	0.034 ^{**} (2.17)	0.049 ^{**} (2.48)
Age 0-6	0.004 (0.04)	0.491 ^{***} (5.63)	
Age 7-16		0.172 [*] (1.73)	0.340 ^{***} (2.74)
Age 17-19		0.025 (0.47)	0.113 [*] (1.77)
Age 65-79	-0.993 ^{***} (-7.81)		-0.670 ^{***} (-5.44)
Age 80 and older	-0.579 ^{***} (-6.49)		-0.549 ^{***} (-6.52)
Left-wing votes	0.239 ^{***} (3.58)	0.169 ^{***} (3.50)	0.062 (1.00)
Women participation rate	0.672 ^{***} (3.66)	0.659 ^{***} (4.97)	-0.061 (-0.36)
Population density	-0.096 (-0.90)	-0.049 (-0.63)	0.000 (0.00)
Mean income	0.562 ^{***} (2.73)	0.414 ^{***} (2.69)	0.354 [*] (1.83)
Women with higher education	0.010 (0.10)	-0.153 ^{**} (-2.09)	0.177 [*] (1.89)
Women in the population	-0.069 (-0.89)	0.017 (0.31)	-0.075 (-1.06)
N obs.	1698	1698	1698
Within R ²	0.867	0.190	0.892

*** Indicate statistical significance at 1%-level, ** at 5%-level and at 10%-level. t-statistics in parentheses. All specifications are in ln-form and include time-dummies.

Table 6. Different proxies of women's representation. Fixed effects.

	<i>Women in majority</i>	<i>Women in majority (-1)</i>	<i>Women in council</i>	<i>Women in council (-1)</i>
Childcare/ Elderly	0.067 ^{***} (3.19)	0.083 ^{***} (3.89)	0.090 ^{***} (3.56)	0.054 ^{**} (2.11)
Childcare/ Education	0.034 ^{**} (2.20)	0.034 ^{**} (2.17)	0.038 ^{**} (2.07)	0.019 (1.02)
Education/ Elderly	0.031 (1.57)	0.049 ^{**} (2.48)	0.058 ^{**} (2.53)	0.042 [*] (1.83)

*** Indicate statistical significance at 1%-level, ** at 5%-level and at 10%-level. t-statistics in parentheses. All specifications include the same control variables as in Table 5.

Table 7. Dynamic specification. GMM

<u>Specification</u>	<i>Childcare/ Elderly care</i>		<i>Childcare / Education</i>	<i>Education/ Elderly care</i>
	<u>A</u>	<u>B</u>	<u>A</u>	<u>A</u>
Women in majority (-1)	0.033** (2.13)	0.079*** (2.59)	0.003 (0.30)	0.025 (1.54)
Dependent var. (-1)	0.508*** (4.22)	0.499*** (6.95)	0.611*** (5.62)	0.292*** (3.10)
Sargan ^a (second-step)	60.27** (0.042)	229.9 (0.970)	50.28 (0.207)	44.56 (0.406)
AR2 ^b (first-step)	-0.495 (0.620)	-0.425 (0.671)	-0.952 (0.341)	-0.959 (0.338)
N obs.	1663	1663	1661	1661
Women in majority	0.010 (0.51)	0.038 (1.05)	-0.003 (-0.24)	0.004 (0.21)
Dependent var. (-1)	0.466*** (4.16)	0.477*** (6.67)	0.546*** (5.55)	0.255*** (3.12)
Sargan ^a (second-step)	73.70*** (0.002)	240.5 (1.000)	54.52 (0.112)	45.59 (0.365)
AR2 ^b (first-step)	-0.062 (0.950)	0.010 (0.992)	-0.944 (0.345)	-0.452 (0.652)
N obs.	1625	1625	1624	1624

- (i) All specifications include the same control variables as in Table 5 and standard errors are robust. *** indicate statistical significance at 1%-level, ** at 5%-level and * at 10%-level.
- (ii) The GMM estimates have been obtained using the software DPD for Ox 3.00.
- (iii) The GMM estimates are all one step.
- (iv) In specification A all explanatory variables are considered to be exogenous and in specification B they are treated as predetermined.
- a) Sargan gives the test statistic and p-value of the Sargan test for over-identifying restrictions. The second step estimations is presented since the test statistic from the first-step has been shown to over-reject in the presence of heteroscedasticity. The null hypothesis is that the instruments are valid/the model is correctly specified.
- b) AR2 is the test statistic and p-value for no second order correlation. The null hypothesis is that there is no second order serial correlation.

Table 8. Dynamic specifications (GMM) allowing for different effects in left-wing and right-wing majorities.

Specification	<i>Childcare/ Elderly care</i>		<i>Childcare/ Education</i>	<i>Education/ Elderly care</i>
	<u>A</u>	<u>B</u>	<u>A</u>	<u>A</u>
Women in left-wing majority (-1)	0.035* (1.86)	0.086*** (3.01)	-0.001 (-0.09)	0.037* (1.84)
Women in right-wing majority (-1)	0.032** (2.08)	0.080*** (2.58)	0.004 (0.37)	0.023 (1.43)
Childcare/ Elderly (-1)	0.505*** (4.19)	0.506*** (6.98)		
Childcare/ Education (-1)			0.616*** (5.76)	
Education/ Elderly (-1)				0.289*** (3.05)
Age 0-6	-0.000 (-0.00)	-0.127 (-1.00)	0.230*** (3.46)	
Age 7-16			-0.145** (-2.47)	0.443*** (5.22)
Age 17-19			-0.060 (-1.55)	0.107* (1.65)
Age 65-79	-0.328*** (-3.60)	-0.439*** (-2.90)		-0.224*** (-2.81)
Age 80 and older	-0.177** (-2.73)	-0.158 (-1.57)		-0.278*** (-3.80)
Left-wing votes	0.037 (1.21)	-0.027 (-0.58)	0.054** (2.16)	-0.020 (-0.72)
Women participation rate	0.429** (2.52)	0.384 (1.50)	0.314* (1.91)	-0.406*** (-3.02)
Population density	0.028*** (3.09)	0.021* (1.66)	0.018*** (2.79)	0.007 (1.21)
Mean income	0.094 (1.08)	0.011 (0.08)	0.161*** (3.19)	0.105 (1.24)
Women with higher education	0.070** (2.10)	0.050 (1.00)	0.041* (1.88)	0.038 (1.47)
Women in population	-0.021 (-0.46)	-0.181 (-0.98)	0.047 (1.00)	-0.059** (-2.14)
Sargan ^a (second-step)	60.60** (0.039)	234.8 (0.977)	50.43 (0.203)	44.76 (0.433)
AR2 ^b	-0.506 (0.613)	-0.434 (0.664)	-0.947 (0.344)	-0.973 (0.330)
N obs.	1663	1663	1661	1661

Same specifications as in Table 7. *** Indicate statistical significance at 1%-level, ** at 5%-level and * at 10%-level. See Table 7 for more information about the table.

- a) Sargan gives the test statistic and p-value of the Sargan test for over-identifying restrictions. The null hypothesis is that the instruments are valid/the model is correctly specified.
- b) AR2 is the test statistic and p-value for no second order correlation. The null hypothesis is that there is no second order serial correlation.

Table 9. IV-regressions

	<i>Childcare/Elderly care</i>		<i>Childcare/Education</i>		<i>Education/Elderly care</i>	
	FE	FE	FE	FE	FE	FE
Women in majority (-1)	0.481 ^{***} (3.52)	0.328 ^{***} (3.01)	0.102 (0.70)	0.115 (1.11)	0.337 ^{***} (2.58)	0.198 [*] (1.85)
Dependent var. (-1)		0.400 ^{***} (8.31)		0.414 ^{***} (11.98)		0.342 ^{***} (6.82)
F(excluded instruments) ^a	4.53 (0.00)	7.44 (0.00)	4.38 (0.00)	4.53 (0.00)	4.34 (0.00)	4.18 (0.00)
Hansen OIR test ^b	0.17	0.33	0.68	1.67	0.51	0.33
	FE	FE	FE	FE	FE	FE
Women in majority	0.273 ^{**} (2.34)	0.264 ^{***} (3.01)	-0.070 (-0.43)	0.061 (0.59)	0.343 ^{**} (2.93)	0.216 ^{**} (2.30)
Dependent var. (-1)		0.399 ^{***} (8.56)		0.409 ^{***} (11.26)		0.356 ^{***} (7.01)
F(excluded instruments) ^a	6.22 (0.00)	4.26 (0.00)	6.00 (0.00)	7.41 (0.00)	6.09 (0.00)	7.30 (0.00)
Hansen OIR test ^b	4.36	1.63	7.19 [*]	1.14	0.38	0.81

- (i) *** Indicate statistical significance at 1%-level, ** at 5%-level and * at 10%-level. t-statistic in parentheses, errors are robust and the control variables are the same as in Table 7.
- (ii) FE stands for fixed effects and the instruments are the percent change in the number of seats in the local council in; small left-wing majority; small right-wing majority; large left-wing majority and large right-wing majority the local council. A local council is large if the number of seats is larger the 45 (the median) and otherwise it is small.
- a) F statistic (and p-value) of the identifying instruments in the first-stage estimation.
- b) The test statistic is obtained by running the residuals from the second stage regression on the instruments and multiplying the R² from this regression by the number of observations. Under the null hypothesis that the instruments are not correlated with the error term, the test is distributed χ_2 with (j-k) degrees of freedom, where j is the number of instruments and k the number of variables instrumented for. Critical value for the test (3 d.f.): 10%=6.25 and 5%=7.82

Table 10. Effect of female representation on the response to shocks.

	<i>Unobservable shocks</i>			<i>Observable shocks</i>	
	NLS	NLS		FE	FE
Women in majority(-1)	0.071 (1.19)			0.078*** (2.94)	
Women in majority		0.052** (2.21)			0.272*** (5.63)
Dep. var. (-1)	0.426*** (17.73)	0.421*** (18.12)		0.434*** (18.09)	0.420*** (18.09)
($z_{it} - z_t$) \times time dummies [η]	0.054*** (2.59)	0.104* (1.68)	--		
Cumulative time-effect 97-89 [$\phi_{97} - \phi_{89}$]	-0.379*** (-8.46)	-0.357*** (-7.08)	--		
			($z_{it} - z_t$) \times dep var. (-1)	0.094*** (2.92)	0.049 (1.49)
			DEM	0.215*** (2.73)	0.249*** (3.22)
			($z_{it} - z_t$) \times DEM	0.029 (0.78)	0.320*** (4.63)
Cumulative effect 97-89 for a municipality with a share of women 1 std. above mean in time t. $\eta[\phi_{97} - \phi_{89}] \times 1$ std.	Short-run effect -0.2%	Short-run effect -0.3%			
	Long-run effect -0.3%	Long-run effect -0.5%			
N obs.	1544	1626		1544	1626
Adj. R ²	0.955	0.954	Within R ²	0.890	0.887

- (i) *** Indicate statistical significance at 1%-level, ** at 5%-level and * at 10%-level. The set of control variables is the same as in Table 5.
- (ii) The specifications with unobservable shocks are estimated using non-linear least squares (NLS) and the ones with observable shocks using fixed effects (FE).
- (iii) One std. in the share of women in the majority is 8.5 percent.
- (iv) ($z_{it} - z_t$) is the deviation of women in the majority from year mean.
- (v) DEM is the number of inhabitants in the age 0-6 divided by the number of inhabitants older than 65.

Table 11. Predicted and actual effect of women's representation in local council on spending

	<i>Effect of women's representation power in the local council</i>					
	Spending on childcare/elderly care		Spending on childcare/education		Spending on education/elderly	
	<u>Theory</u>	<u>Data</u>	<u>Theory</u>	<u>Data</u>	<u>Theory</u>	<u>Data</u>
The whole sample	+	+	0	0	+	Mixed result
Left-wing parties	+	+	0	0	+	+
Right-wing parties	+	+	0	0	0	0