Voting, Taxes and Heterogeneous Preferences: Evidence from Swedish Local Elections*

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Abstract

A standard finding in the literature on political agency is that voters punish incumbents who raise taxes. Typically, only the reaction of a representative voter is considered, with the notion that all voters dislike high taxes because the revenue is, at least on the margin, spent on rent-seeking activities. In this paper we question this interpretation by considering the heterogeneous responses to tax changes in the electorate. Using high-quality panel survey data from Swedish local politics we find that voters who, ex ante, prefer a small public sector punish incumbents who raise taxes, while voters who prefer a large public sector actually reward tax hikes. This result holds also conditional on individuals' past voting behavior and for voters who have low confidence in politicians, indicating that Swedish voters interpret tax changes based on their own policy preferences, rather than as going to wasteful activities.

Keywords: Electoral accountability, local taxation, voter preferences, political agency

JEL Classification: D72, H71

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1 Introduction

In representative democracies, voters have delegated the responsibility to implement public policies to elected politicians. Ideally, voters would like these politicians to implement policies that are in the voters' best interest. However, it is not possible for voters to perfectly control what politicians will do once they are elected, and politicians cannot always commit to a policy platform before an election. Also, voters have limited knowledge of the intentions and preferences of the politicians. By instead conditioning the decision to reelect the incumbent on past policy outcomes, voters can incentivize good behavior and weed out incompetent politicians. As a consequence, even rational and forward-looking voters may base their vote decisions on the incumbent's past behavior in office.

There is also vast empirical evidence that voters do react to past policies at the election booth. In a influential paper, Peltzman (1992) studies post-World War II U.S. gubernatorial elections and finds that voters penalize federal and state spending growth, concluding that voters are fiscally conservative. Findings in later empirical work by, e.g., Besley (2006) and Niemi et al. (1995), indicate that voters punish U.S. governors for setting high taxes, which is to some extent in line with Peltzman's conclusion.[1] In addition, Besley and Case (1995b) (U.S. states) and Revelli (2002) (U.K. districts) instead find that voters punish incumbents for setting higher taxes than politicians in neighboring regions.[2] That incumbents will be punished for setting high taxes is also an implicit assumption in the empirical literature analyzing election cycles in public spending and taxes, see, e.g., Kneebone and McKenzie (2001); Andrikopoulus et al. (2004); Dahlberg and Mörk (2011); Foremny and Riedel (2014).

But should we expect all voters to dislike high taxes? Because tax revenues can be spent on valuable goods and services, are there voters who are in fact more likely to vote for an incumbent raising taxes? To our knowledge, no paper has tested whether this is the case. The aim of this paper is to investigate such heterogeneous responses to tax changes at the municipal level in Sweden. We find that voters' responses to local taxation clearly depend on their preferences for public spending. Conditional on how they voted in the last election, we show that voters who prefer a large public sector is more likely to vote for a ruling coalition who raised taxes during the election term, while the converse is true for voters who prefer a smaller public sector. Because the average reaction to tax changes is close to zero in the electorate, our findings suggest that Swedish voters do not interpret tax hikes as indicative of rent-seeking behavior, but rather as reflecting ideological differences regarding the size of government.

[1] Lowry et al. (1998) find that voters' responses depend on the political identity of the incumbent; whereas Republican candidates are punished for unanticipated increases in the size of the budget, Democrats may actually be rewarded.

[2] See Bordignon et al. (2004) for a theoretical discussion on this type of yardstick competition.

Our paper is closely related to the political-agency literature (see Besley 2006 for an excellent overview). In political-agency models, voters react negatively to high taxes because resources collected through taxation is assumed to, at least partly, be wasted, either due to incompetent politicians or due to politicians engaging in rent-seeking activities. The argument was first put forth by Barro (1973) and Ferejohn (1986) that consider rent-seeking politicians in pure moral hazard models. Voters try to curb rent-seeking activities by conditioning their reelection decision on the incumbent's behavior. They do so by choosing an optimal threshold value where they reelect the incumbent if taxes are lower than that threshold, and vote the incumbent out of office otherwise. In this way, they give rent-seeking politicians incentives to not collect maximum rents.[3] Later models developed by Rogoff (1990), Persson and Tabellini (2000) and Besley (2006), among others, extend the analysis by also introducing elements of adverse selection. In a setting where some politicians are more competent, or less prone to engage in rent-seeking activities, than others and where voters have imperfect information about politicians' types, incumbents will implement policies in order to signal that they are "good". As a result, in separating equilibra, voters will not reelect "bad" politicians that reveal their type by setting high taxes (or spending).[4]

Of course, public resources are not only spent on wasteful activities, but can also be used to supply valuable goods and services. The influential citizen-candidate model (Osborne and Slivinsky 1996; Besley and Coate 1997) builds on the premise that politicians hold preferences over the level of productive public spending, and that their preferences determine policy outcomes.[5] Voters would therefore like to elect politicians that implement policies in line with those preferred by the voters. If the politicians' policy preferences are hidden to voters, a tax increase may be a signal to voters that the incumbent prefers a large public sector. By conditioning reelection decisions on past policies, voters may either select politicians with preferences that corresponds to those of the voters, or discipline politicians to implement policies preferred by the voters.[6]

There are hence two different interpretations for why voters would respond to tax policies. One is that politicians are rent-seeking or incompetent, and that high taxes indicate wasteful or inefficient public spending. The other is that politicians use taxed resources for productive

[3] Besley and Case (1995a) find that term-limited governors implement different policies (i.e. higher spending and taxes) which is in line with the moral hazard model.

[4] Alt et al. (2011) exploit variation in U.S. gubernatorial term limits in order to disentangle accountability and competence effects. Their findings indicate that voters use elections to throw less competent incumbents out of office. For Swedish municipalities, Pettersson-Lidbom (2006) finds that governments who are reelected, on average set lower tax rates compared to those who are voted out of office. He interpret these findings from an agency perspective where high taxes signal rent-seeking behavior.

[5] That this is the case in Sweden is indicated by empirical evidence in Pettersson-Lidbom (2008). Using a regression discontinuity design, he finds that left-wing local governments spend and tax 2–3% more than right-wing governments, a difference that cannot be attributed to voters' preferences. His conclusion from these findings is that politicians' preferences indeed matter in the Swedish context.

[6] Similar arguments are put forth in the theoretical models by, e.g., Alesina and Cukierman (1990); Cukierman and Tommasi (1998); Schultz (2002) and Acemoglu et al. (2013).

public spending, and that voters' reactions depend on to what extent the level of public spending and taxes corresponds to the preferences of the voters. In order to separate between these two potential explanations, one would ideally like to have data on both the level and quality of publicly provided services together with taxation data. However, reliable data on quality is typically not available, and using the level of spending as a proxy for quality is not satisfactory since such data cannot capture how efficiently public goods and services are provided.

In this paper, we approach the question from a slightly different angle. Specifically, if taxed resources are wasted, we would expect voters to uniformly dislike tax hikes. On the other hand, if the resources are used for productive public spending, we would expect *heterogeneous* responses among voters, depending on their preferences. That is, voters who prefer a large government sector might actually *reward* an incumbent that raised taxes the previous term. To distinguish between the two competing views, we will test whether such heterogeneous responses exist among Swedish voters. To do so, we rely on Swedish survey data containing information about voters' preferences, as well as information on how the respondents state that they cast their votes in local government council elections. Thanks to the panel dimension of the data, where each respondent is surveyed in connection to two consecutive elections, we are able to i) compare voters' preferences at the beginning of an election term with ii) the policies implemented by the incumbent while in office and, iii) with the same voters' responses to these policies in the elections at the end of the election term. We are also able to control for which party the voter voted for in the past election, implying that we identify the effect from *changes* in voting behavior. In this way we can empirically investigate whether citizens with preferences for a large public sector are less prone to punish incumbents for setting high taxes than voters with preferences for a small public sector. Our data cover the period 1982–2006, during which eight local elections took place in 269 Swedish municipalities.

We find that voters' preferences for public spending clearly matter for how voters react to tax changes. While voters on average do not seem to dislike taxes, there is a large heterogeneity among them. Voters who prefer a smaller government sector are less likely to vote for an incumbent who raised taxes the previous election term, while voters who prefer a large government sector actually rewards tax increases. This result stands in contrast with the findings in the agency literature, suggesting that voters in Sweden do not consider tax hikes as indicative of rent-seeking activities, but rather as reflecting different policy positions.

The remainder of the paper is organized as follows: In the next section, we briefly describe the Swedish setting and the role played by local governments. Section 3 presents our data and some descriptive analysis, followed by the empirical strategy in section 4. We then present our empirical results, with the final section concluding the paper.

2 The Swedish setting

Sweden has a long tradition of strong and autonomous local governments[7] that are responsible for supplying important welfare services such as child care, schooling, care for the elderly and local infrastructure.[8] Personnel costs account for the bulk of municipal expenditures. The municipalities finance their activates through a proportional income tax,[9] intergovernmental grants from the central government and, to a lesser extent, user fees. Their right to set taxes is established in the constitution, and income from these locally set income taxes accounts for approximately 60–70% of local government revenues.[10] The system of intergovernmental grants transfers resources from the central to the local level, as well as between municipalities depending on their tax bases and cost structures. During the period of our study, there were between 279 and 290 municipalities in Sweden, with a median population of 15,600 inhabitants.

The municipalities are governed by a municipal council elected in local proportional elections (held on the same day as the central government election). Elections are held in September of every fourth year (until 1994, every third year), and the municipal election is held at the same date as the national (and county) election. The municipal council sets tax rate and budget for the upcoming year in the last months of the year. Our data cover the period 1982–2006, which implies that we have data from eight local elections. During that time period, the turnout rate has varied between 78% and 90%.

Sweden is a multiparty-system, with largely the same parties at the local and central levels. These parties are the Left Party, the Social Democrats and the Green Party typically considered as left-wing parties, and the Centre Party, the Liberals, the Christian Democrats and the Moderates, typically considered as right-wing parties.[11] Although there is no formal local government, a subset of parties typically agree on the budget and other important policy decisions. We denote this subset of parties as belonging to the ruling coalition. The executive branch of the local government is the municipal board. In contrast to the national level, the opposition parties are

[7]There are two parallel layers of local governments in Sweden, municipalities and counties, where the latter are primarily responsible for health care. In this paper, we focus on the municipalities.

[8]Since the 1990's, private providers of welfare services have been growing in importance. However, even the services provided by public companies are financed by the municipal budget and the private providers are not allowed to charge the user directly if they would like to be reimbursed by the municipality. The public sector remains the dominant provider.

[9]In addition to the municipal tax rate, which is approximately 20% of labor income, individuals also pay a proportional income tax to the counties (approximately 10%). These two taxes are often presented together as the municipality tax rate ("kommunalskatt"). For labor incomes above a certain threshold, the taxpayer also pays a central government income tax. In the tax returns, the state and local taxes are presented separately.

[10]The taxation right was temporarily overridden by a centrally mandated local tax freeze from 1991 to 1993, see below.

[11]Nowadays, the Sweden Democrats play an important role in Swedish politics, but they emerged late during our studied period and were not, at that time, represented at the national level, and with limited presence in local municipal councils.

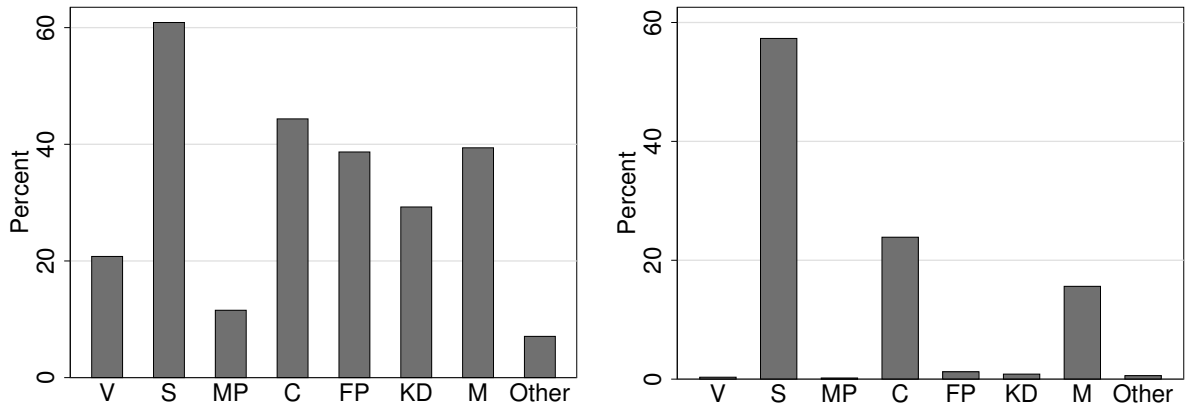

Figure 1: Percent of each party being incumbent

Note: The left panel shows the percent of municipalities in which a given party was part of the ruling coalition. The right panel shows percent of municipalities in which the chairman of the municipal board came from a given party. The acronyms are: V = Left Party, S = Social Democrats, MP = Green Party, C = Centre Party, FP = Liberals, KD = Christian Democrats, M = Moderates

generally also represented in the municipal board. Typically, the position as chairman of the board is held by the largest party in the ruling coalition.[12] This position is generally considered the most important in municipal politics, equivalent to the mayoral position in many other countries (Folke and Rickne 2016).

For our empirical analysis, we have compiled data on coalitions as well as the party of the chairman of the board from several different sources, something that is described in more detail below. The left graph of Figure 1 shows the percentage of municipalities in which each party formed part of the ruling coalition. The Social Democrats were the party who, during the studied period, were most likely to belong to a ruling coalition, followed by the four right-wing parties. The right graph shows that the chairman of the municipal board came almost exclusively from the Social Democrats, the Centre Party and the Moderates. Figure 2 illustrates that the four right-wing parties typically formed coalitions with each other, while the most common coalition partner for the Social Democrats was the Left Party, followed by the Green Party and the Centre Party. It is worth noting that it is quite common that not all of the parties that are characterized as left-wing or right-wing take part in a ruling coalition. For example, in around half the cases where the Social Democrats were in power, they ruled by themselves. Also, coalitions across the left-right wing dimension exist: In over 14% of the cases, there was a coalition involving at least one left-wing and one right-wing party.

[12]In our data, this is true for over 91% of the municipalities.

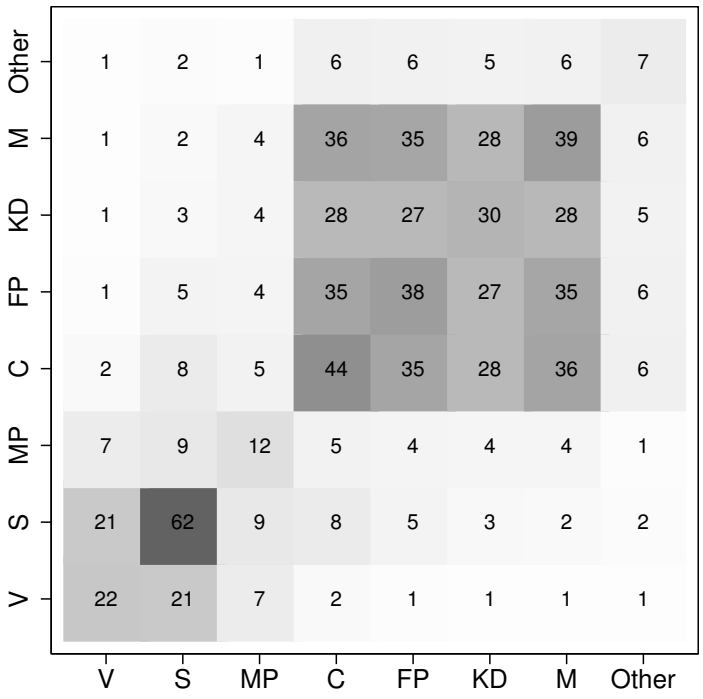

Figure 2: Party coalitions

Note: The figure shows how common it is for two parties to take part in the same ruling coalition, with the number indicating the percent of coalitions the two parties were represented in. The shading is proportional to this number. The diagonal elements from the bottom left to the top right corner correspond to the left graph of Figure 1.

3 Data

We base our empirical application on three types of data: the Swedish National Election Study, which is a survey conducted in connection with Swedish elections, data over political coalitions and the chairman of the municipal board, and register data from Statistics Sweden on municipal tax rates, and other municipal characteristics. The period we analyze is 1982–2006, during which eight elections took place.

3.1 The Swedish National Election Study

The Swedish National Election Study randomly surveys approximately 3,500 eligible voters aged 18–80, where half are interviewed before the election and the other half after. The interviews are mainly conducted as face-to-face interviews, and to get as high response rate as possible, there is also an option to take a shorter survey, and in some cases to take it over the phone. Those interviewed before the election are also sent a short post-election survey by mail. The response rate to the survey is unusually high: during our studied period, 77% answered at least part of the survey.

The survey is constructed as a rotating panel, so that each respondent is surveyed in connection with two consecutive elections. The survey covers a wide range of political and economic issues. In addition, the survey is complemented with register data on age and gender. Furthermore, the data also include register-based information on turnout, meaning that we know whether each individual actually voted in the municipal election, information that is also available for non-respondents. Since the empirical strategy, presented in next section, rely on observing individuals both at the beginning and the end of an election term, we only use data for individuals who took part in two consecutive surveys. In the appendix we provide additional information regarding the sampling and to what extent these respondents are representative of the population of interest.

The question we use to capture voters' preferences for public consumption is formulated in the following manner:

> What is your opinion on the proposal to reduce the size of the public sector?
>
> -2. A very good proposal
>
> -1. A relatively good proposal
>
> 0. Neither a bad nor a good proposal
>
> 1. A relatively bad proposal
>
> 2. A very bad proposal

Although the question does not concern the size of the local public sector but the public sector in general, we consider it appropriate for capturing respondents' preferences for local public services, given that the local sector accounts for the lion's share of the public sector in Sweden, and provides the most important welfare services, such as child care, schooling and care for the elderly.

Figure 3 shows the shares for each response for the preference variable, where we code the responses from -2 to 2 such that 2 is the most positive attitude towards the public sector. The first graph is for the entire sample, while the second and third show the variable for left-wing voters and right-wing voters. As expected, left-wing voters are much more likely to have a positive attitude towards public spending compared to right-wing voters.[13]

3.2 Municipality data

Out of Sweden's 290 municipalities, we exclude the 21 municipalities that were involved in a split or merger during the period of study. For the remaining 269 municipalities, we have aggregated municipality data from Statistics Sweden on municipal tax rates, the number of seats held by each party in the municipal council, as well as some other socioeconomic characteristics of the municipalities.[14]

During the 1990s, there was a gradual transfer of responsibilities from the county to the municipal level, primarily concerning elderly care, which was combined with an increase in the municipal tax rate and a corresponding decrease in the county tax rate. Because the total local tax rate (municipal + county tax rates) remained unchanged, we find it unlikely that voters would react to changes in the municipal tax rate that occurred only because of the reform. We therefore remove these tax changes in the data. In the appendix we describe these reform changes in more detail and how we adjust the data.

Figure 4 depicts the evolution of the municipal tax rate (after our adjustments). Between 1982 and 2006, the municipal tax rate increased, on average, with around one percentage point.[15] Consistent with the overall increase in the municipal tax rate, the graph also shows that in most years more municipalities increased than decreased the tax rate.

There is also a number of years where no municipality increased the tax rate. Between 1991–1993 there was a nationally mandated tax freeze where the municipalities were not allowed to

[13]It is not obvious how one should treat individuals responding "Neither a bad nor a good proposal". In the empirical analysis, we interpret their responses as being satisfied with the current level of public consumption (and taxes). Alternatively, we could consider these individuals as being indifferent between a large and small public sector. If these individuals are excluded, the main finding of the paper is unchanged (results available upon request).

[14]We use, among other variables, unemployment rate as a control variable. That variable comes from the Swedish unemployment agency, Arbetsförmedlingen.

[15]The county tax was included in the municipal tax for the municipalities of Gotland (whole time period), Göteborg and Malmö (until the year 1998).

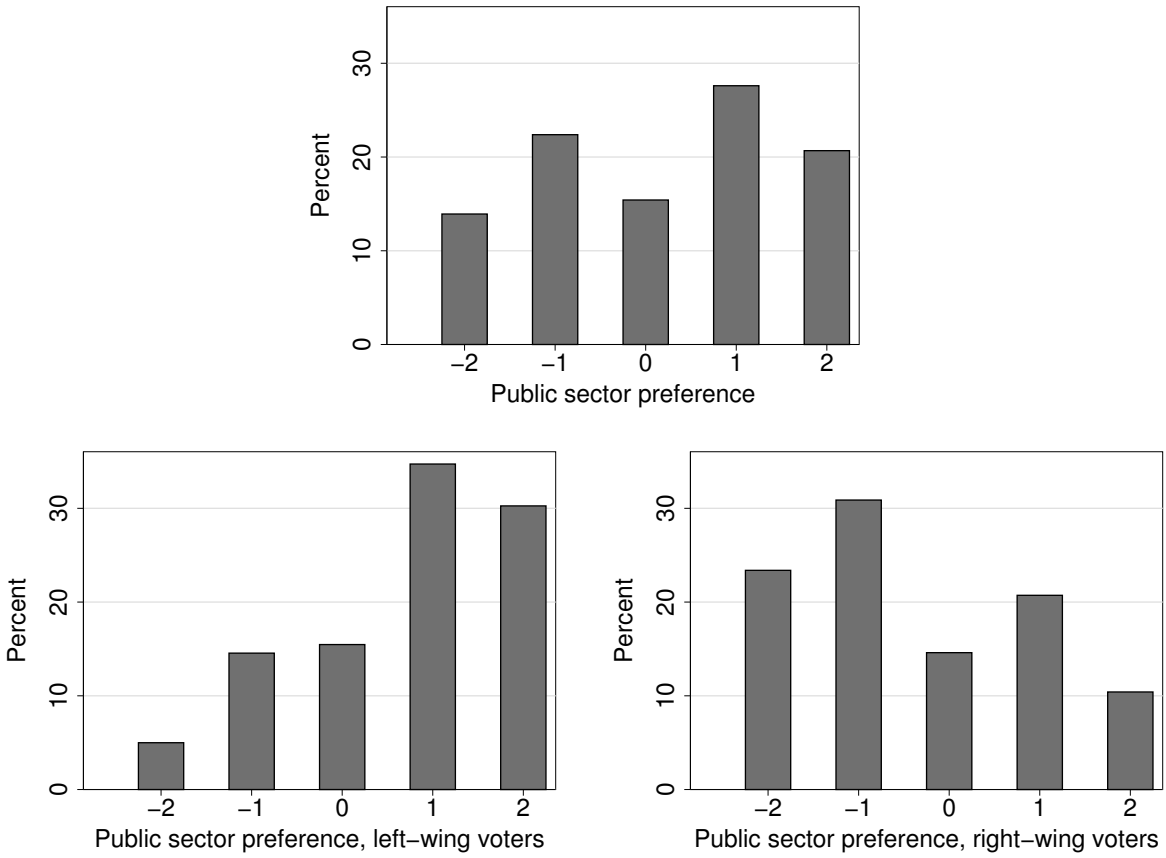

Figure 3: Distribution of the preference variable

Note: The Figure depicts the percent of respondents in each preference category for all respondents (top panel), and left-wing and right-wing voters, respectively (bottom panel).

increase the local tax rate above the 1990 level. In addition, for the years 1994, 1997 and 1998, the central government incentivized municipalities with intergovernmental grants to not raise taxes, something that had a very similar effect as the tax freeze (see Statskontoret 2011). In a sensitivity analysis below, we address this particular issue.

3.3 Coalition data

Our third set of data concerns coalitions at the local level. Previous literature analyzing Swedish politics has tended to classify the parties into belonging to a left-wing and right-wing bloc (see, e.g., Alesina et al. 1997, Pettersson-Lidbom 2008). In this paper we use data on actual coalitions. For the last three elections terms (1994–2006) such data is available from SKL (Swedish Association of Local Authorities and Regions). The data contain information on who formed a part of the ruling coalition after the election, and before the next election. In the analysis, we exclude municipalities where the coalition changed during the election period. For the previous four election periods (between 1982–1994), we fielded our own survey to all Swedish municipalities where we asked which parties formed ruling coalitions during the election period. In total, we received responses from 208 of the 269 municipalities in our sample (77% response rate). For data on which party the chairman of the municipal board comes from, we have acquired the database "Kommunfakta" which contains this information. As can be seen from Figure 2, coalitions do not always follow the traditional left-right dimension.

4 Empirical Strategy

In this paper, we are interested in testing whether voters' reaction to tax changes depend on their preferences for public consumption. More specifically, is it the case that voters that prefer a large public sector are more inclined to reelect the incumbent local government if it has increased taxes during its term in office, than voters that prefer a smaller public sector? To answer this question, we estimate the following model:

$$vote\_inc_{ijt} = \gamma_t + \beta_1 \Delta tax_{jt} + \beta_2 pref_{ijt-1} + \beta_3 \left(\Delta tax_{jt} \times pref_{ijt-1}\right) + \Delta \mathbf{Z_{jt}} \boldsymbol{\rho} + \Delta \mathbf{Z_{jt}} \times pref_{ijt-1} \boldsymbol{\delta} + \beta_4 vote\_inc_{ijt-1} + \varepsilon_{ijt}, \quad (1)$$

where the outcome variable, $vote\_inc_{ijt}$, is a dummy variable indicating whether the respondent i in municipality j at time t voted for one of the parties in the ruling coalition. Because one way for citizens to show their discontent with their ruling politicians is to abstain from voting we include also citizens who either abstained from voting, or who cast a blank vote. $pref_{ijt-1}$

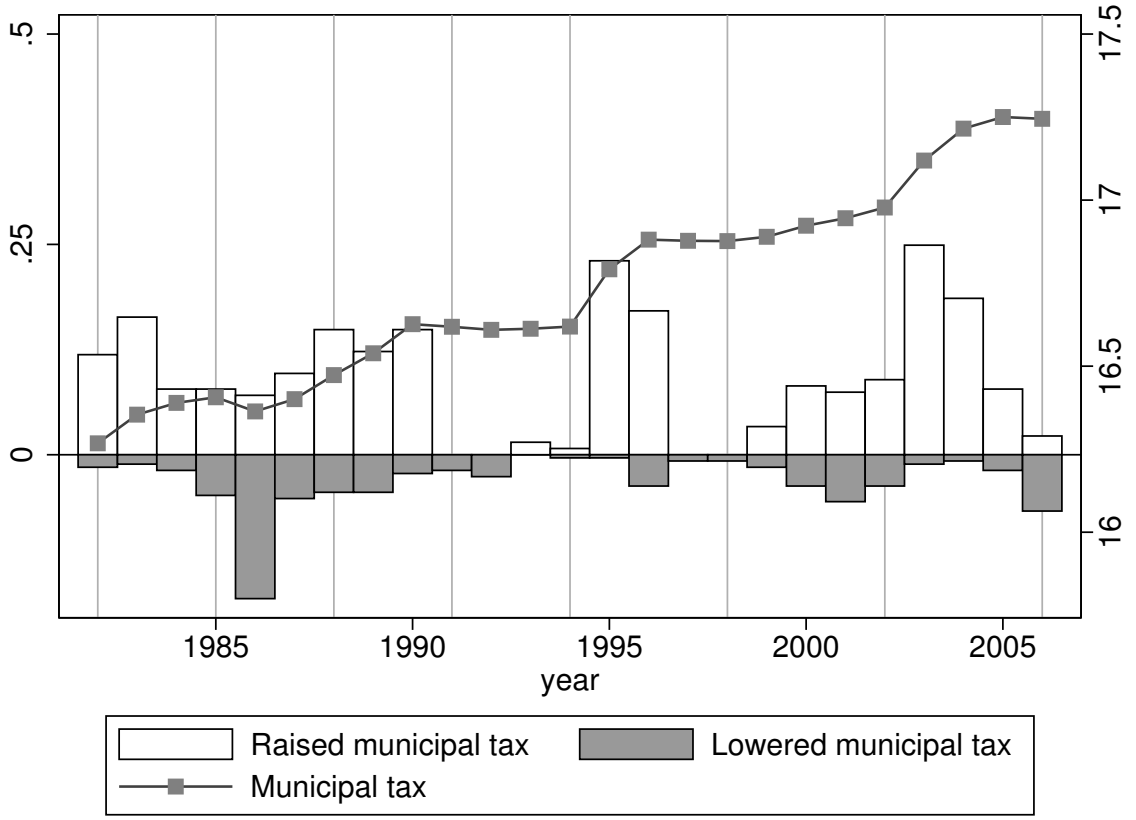

Figure 4: Evolution of municipal tax rate

Note: The Figure depicts the evolution of the municipal tax rate over time, excluding reform effects (the relevant y-axis is on the right-hand side). The bars show the share of municipalities that lowered and raised taxes during each year after reform effects have been removed (the relevant y-axis is on the left-hand side). The vertical lines indicate election years.

is respondent i's (living in municipality j) preference regarding the public sector reported at the time of the previous election. This variable takes values from -2 to 2, where 2 indicates a preference for a relatively larger public sector. Δtax_{jt} denotes the change in the municipal income tax rate from the previous election. The variable of interest is the interaction between $pref_{ijt-1}$ and Δtax_{jt}. Our hypothesis is that there is a positive interaction effect between these two variables ($\beta_3 > 0$), indicating that voters who prefer a large public sector are relatively more likely to vote for incumbents who raised taxes compared to voters who prefer a smaller public sector. We also include time-specific intercepts, γ_t.

Important for our application is that $pref_{ijt-1}$ is determined before Δtax_{jt} which means that we can study voters' reactions to tax changes depending on their preferences for the size of the public sector *before* the tax changes are realized. It is of course possible that taxes change during the election term in response to changing economic circumstances, not realized at the time of the previous election. For instance, a negative shock to the economy, lowering the taxable income, might necessitate the municipalities to raise taxes to maintain public services. To control for such changing circumstances, not known by voters at time $t-1$, we include a vector of time-varying municipal covariates in the vector $\Delta\mathbf{Z_{jt}}$, which measure changes since last election. This vector includes controls that are likely to affect the municipal tax rate: changes in taxable income, unemployment rate, population size and share of young (aged 0 to 14) and old (aged 80 and above). Because Δtax_{jt} is included both by itself, as well as interacted with $pref_{ijt-1}$, $\Delta\mathbf{Z_{jt}}$ must be included in the same way to flexibly control for changes in Δtax_{jt} due to changing economic circumstances.

Finally, we also control for whether the respondent voted for the *current* incumbent in the previous election, $vote\_inc_{ijt-1}$. By doing this, we control for voting preferences which are fixed over time, and instead estimate changes in voting behavior depending on how taxes changed during the election term.

5 Results

5.1 Baseline estimates

We begin our empirical analysis by replicating the finding from previous literature that voters, on average, are less likely to vote for incumbents who raise taxes. The first column in Table 1 shows that an increase in the municipal tax rate with one percentage point is associated with a decrease in the probability of voting for the incumbent with approximately two percentage points. However, this effect is not statistically different from zero. There is therefore only weak

evidence of voters on average disliking taxes.[16]

In the second column, we estimate the interaction model. Here we find a large positive, statistically significant, interaction effect between tax changes and voter preferences, in line with our hypothesis. Once municipality controls are included (column 3), the point estimate drops somewhat but is still statistically significant. In the fourth column we include the control for past voting behavior to estimate the baseline model (Equation 1). The point estimate drops further, but continues to be statistically significant. As expected, the inclusion of past voting behavior removes much of the variation in the outcome variable, something that can be seen in the jump in R^2.

To get a sense of whether the estimated effect is large or small, it helps to relate it to changes in the tax rate. Our estimate indicates that an increase (decrease) in the municipal tax rate with one percentage point is associated with a relative increase (decrease) in the probability of voting for the incumbent of around 15 percentage points for the voters most positive, compared to those least positive, towards the public sector.[17]. This sounds like a very large effect, but note that a one percentage point change in the municipal tax rate is a large change; a change of at least that magnitude is observed in around 8% of the data. The corresponding number for a standard deviation change in the municipal tax rate is more than 6 percentage points. Because the preference variable is scaled between -2 and 2, the nonsignificant main effect of a change in the local tax rate implies that individuals who think it is neither a bad nor a good proposal to reduce the size of the public sector do not react to tax changes.

In the baseline specification we do not include any individual level controls. The reason for this omission is that, as opposed to municipality controls, it is not clear what type of endogeneity problem individual controls solve. Nevertheless, in column 5 we show that the inclusion of individual controls for education, work status, age, gender, cohabiting status and presence of children in the home do not affect the result in any significant way. Because there is no clear theoretical reason for the individual controls we do not include them in the rest of the paper.

In the model in equation (1) there is a linear interaction between a tax change and public sector preference. With this approximation, the point estimate implies that there is a linear change in probability of voting for the incumbent to a tax change depending on preferences. In Figure 5 we show point estimates and confidence intervals when $vote\_inc_{ijt}$ has been regressed on Δtax_{jt} (and year effects, municipal controls and voting for incumbent in last election) for each preference category separately. As comparison, the estimated marginal effect from the baseline model (column 4 of Table 1) is also included.

The figure illustrates that it is the voters who are at the extremes of the preference distribution

[16] Adding municipal controls do not make any difference for the results.

[17] $0.037 \times (2 - (-2)) \approx 0.15$

Table 1: Voting for incumbent coalition

	(1)	(2)	(3)	(4)	(5)
Δ Tax	-0.020	-0.018	-0.016	-0.019	-0.019
	(0.019)	(0.020)	(0.022)	(0.018)	(0.018)
Pref., $t-1$		0.025***	0.067***	0.0031	0.0095
		(0.0085)	(0.016)	(0.011)	(0.011)
Δ Tax $\times$ Pref., $t-1$		0.059***	0.045***	0.037***	0.036***
		(0.014)	(0.015)	(0.011)	(0.010)
Voted inc., $t-1$				0.64***	0.64***
				(0.013)	(0.013)
Year effects	✓	✓	✓	✓	✓
Municipality controls			✓	✓	✓
Individual controls					✓
Obs.	4,749	4,749	4,749	4,581	4,392
R^2	0.00	0.02	0.02	0.43	0.45

Note: The dependent variable is an indicator for voting for any party in the incumbent coalition. The municipality controls are included both by themselves, as well as interacted with the preference variable. Standard errors, shown in parentheses, are clustered at the municipal level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

that react to tax changes. The probability that voters think it is a very good proposal to reduce the size of the public sector is reduced with almost 11 (more than 4) percentage points for a one percentage point (standard deviation) increase in the tax rate. Conversely for voters that are most positive towards the public sector a one percentage point (standard deviation) increase in taxes is associated with a 9 (almost 4) percentage points increase is support for the incumbent. The point estimates are not statistically significantly different from zero for any of the three middle categories.

5.2 Sensitivity analysis

We now turn to testing the sensitivity of our results. As illustrated in Figure 4, during the years 1991–1994 and 1997–1998, the municipalities could not freely increase that municipal tax rate, either because of a tax freeze or because of the central government grant system. In the first column of Table 2 we therefore exclude the election period of 1991–1994, because this is the only election period when municipalities could not raise taxes at all. The results are not affected in any way by this restriction.[18]

[18]If all election periods where the restriction was in place during at least part of the period (i.e., 1988–1998) are removed, the interaction effect is even stronger. That result is available upon request.

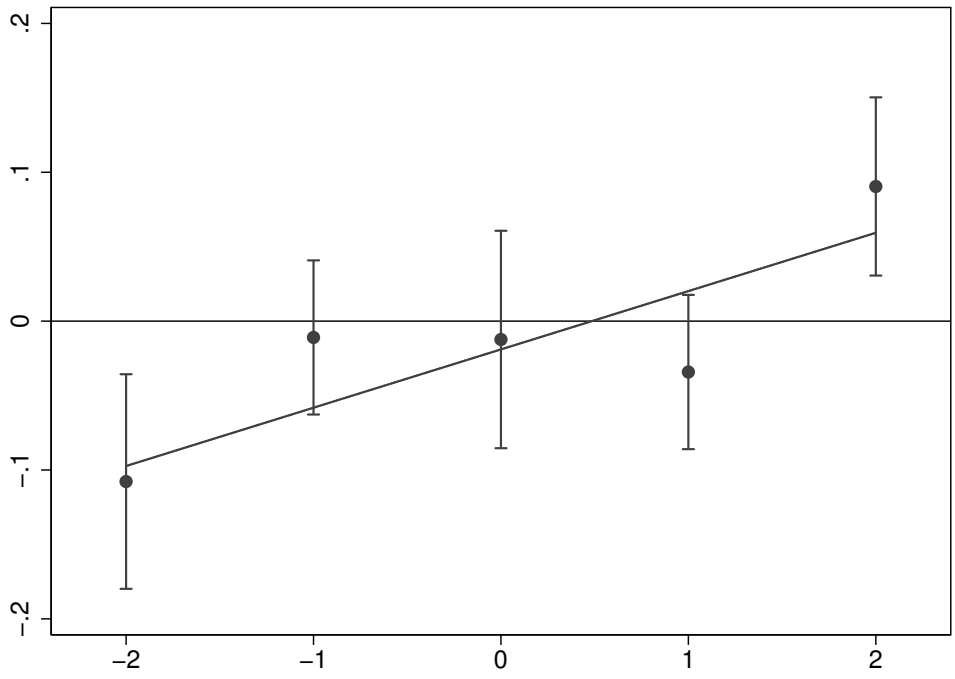

Figure 5: Effect of change in municipal tax rate, by preference category

Note: Each of the five preference categories is shown on the x-axis. The figure show the point estimates and 95% confidence intervals for the estimated effect of a tax change on voting for the incumbent coalition for each preference category separately. Standard errors are clustered at the municipal level. Municipal controls, year effects and control for voting for current incumbent in last election are included for each regression. The regression line show the marginal effect of a tax change from the estimation in column 4 of Table 1.

Table 2: Sensitivity analyses

	(1) Excl. 1994	(2) Trad. blocs	(3) Chairman's party	(4) Right-left pref.	(5) Same municipality	(6) Municipality reweighting	(7) Total local tax	(8) County tax
Pref., $t-1$	0.0083	0.027**	0.012	-0.0027	0.0066	0.00038	-0.00086	-0.0011
	(0.012)	(0.012)	(0.010)	(0.0075)	(0.015)	(0.013)	(0.013)	(0.013)
Δ Tax	-0.024	-0.00059	-0.021	-0.021	-0.014	-0.017	-0.012	-0.0098
	(0.017)	(0.016)	(0.018)	(0.018)	(0.020)	(0.017)	(0.011)	(0.016)
Δ Tax $\times$ Pref., $t-1$	0.037***	0.019**	0.016	0.028***	0.034***	0.037***	0.020***	0.012
	(0.011)	(0.0091)	(0.012)	(0.0063)	(0.011)	(0.012)	(0.0060)	(0.0094)
Voted inc., $t-1$	0.64***	0.67***	0.66***	0.65***	0.64***	0.62***	0.64***	0.65***
	(0.014)	(0.014)	(0.014)	(0.013)	(0.015)	(0.016)	(0.013)	(0.013)
Year effects	✓	✓	✓	✓	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓	✓	✓	✓	✓
Obs.	4,000	3,996	4,581	3,782	3,498	4,581	4,581	4,198
R^2	0.43	0.46	0.46	0.45	0.43	0.41	0.43	0.43

Note: In columns 1 and 4–8, the dependent variable is an indicator for voting for any party in the incumbent coalition, whereas in column 2 it is an indicator for voting for the traditional bloc having more than 50% of the seats, and in column 3 it is an indicator for voting for the chairman of the municipal board's party (the same division is also made for the indicator for voting in the last election). The tax variable is the municipal tax rate in columns 1–6, the total local tax (municipal + county) in column 7, and county tax only in column 8. In column 1, the year of 1994 is excluded. In column 4, the preference variable is ideological placement on a right-left scale from -5 to 5. In column 5, the sample is restricted to individuals living in the same municipality both survey years and in column 6, the sample is reweighted according to the discussion in the appendix. The municipality controls are included both by themselves, as well as interacted with the relevant preference variable. Standard errors, shown in parentheses, are clustered at the municipal level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

It is possible that there are measurement error in the way we define coalitions, especially for the earlier period when we performed our own survey (1982–1994). We therefore consider two alternatives to defining the incumbent. First, we define the incumbent coalition by using the traditional way of dividing Swedish political parties into one left-wing and one right-wing bloc, where any municipality where neither bloc has a majority is excluded. Results in the second column indicate that with such a division, the point estimate decreases substantially, but is still statistically significant at the 5% level. This decrease is consistent with the traditional blocs being proxies for the real coalitions.

Second, we let the incumbent be defined as only the party the chairman of the board comes from (in the third column). The point estimate is less than half of the baseline estimate and not statistically significant. An interpretation of this result is that voters do not only hold the leading party accountable for tax policy, but also other parties in a ruling coalition.[19]

One possibility is that voters who prefer a small public sector do so because they believe the public sector works inefficiently and that politicians are rent-seeking. In the fourth column we replace the preference variable with respondents' placement on a ideological scale, ranging from -5 (far to the right) to 5 (far to the left). While this variable might also be dependent on beliefs about government efficiency, it is likely less so than the public sector preference variable. We find the same pattern here with a positive and statistically significant interaction effect. A one percentage point increase (decrease) in the municipal tax rate is associated with a relative increase (decrease) on the probability of voting for the incumbent of more than 28 percentage points for the voters most far to the left compared to those most far to the right. The corresponding number for a standard deviation change is almost 12 percentage points.

In the estimations so far, we have not put any restrictions in place that the respondents should live in the same municipality during the election period to avoid selection bias in our results. Nonetheless, it is a possibility that individuals who recently moved in to a municipality are not aware of the tax changes during the election period. In column 5 we therefore restrict our sample to respondents who lived in the same municipality at the time of both surveys. As shown in the table, the results do not change much with this restriction.

In all our results, each individual has the same weight. An alternative would be to reweigh the sample according to the number of individuals entitled to vote in respectively municipality, to deal with possible selection bias in the survey at the municipal level. In column 6 we reweigh the sample in this way. As shown in the table, this reweighting does not affect the results in any significant way.[20]

[19]It should be noted that fewer individuals vote for the chairman's party (32%), compared to any party in the ruling coalition (46%), so in percentage term, the drop in point estimate is smaller.

[20]In the appendix we also show that the means of observable characteristics do not changes much when the sample is reweighted.

We focus on responses to the municipal tax because that is the tax that is set by the municipality. However, it is perhaps more likely that voters observe the total local tax (the municipality and county tax) since those two taxes are often combined. Furthermore, by considering the total local tax, we do not have to take the reform effects into account since the reforms only implied differences in responsibility between the municipality and county level. In column 7, we therefore use the total local tax instead of the municipal tax.

The point estimate of the interaction effect when using the total local tax is smaller in size, but also more precisely estimated. This decrease can mainly be explained by the standard deviation of the total local tax being greater than the municipal tax (0.69 compared to 0.41). A standard deviation increase (decrease) in the total local tax rate is associated with a relative increase (decrease) on the probability of voting for the incumbent of more than 5% for the voters most positive, compared to those least positive, towards the public sector, an estimate very close to the baseline estimate.[21]

Finally, in the eighth column, we only consider responses to the county tax. If voters are well-informed, we should not expect voters to hold the municipal coalition accountable for changes in the county tax. Indeed, while the estimate of the interaction effect is positive, it is smaller in size than the baseline estimate and not statistically significant, suggesting that voters hold the municipal coalition accountable for the municipal tax rate, but not the county tax rate.[22]

5.3 Heterogeneous effects

Finally, we perform a number of heterogeneity analyses in order to dig deeper into the mechanism at hand. First, if voters have low confidence in politicians it would make more sense for them to interpret a tax increase as a signal of rent-seeking activities, rather than as being used for productive public spending. Hence, we would expect the interaction effect to be less pronounced for individuals with lower trust in their elected officials if they believe taxes are wasted anyway. We therefore split the sample into two groups, one for individuals who have fairly high or very high confidence in politicians and the other for individuals who have fairly low or very low

[21]It should be noted that in all estimations in this paper, standard errors are clustered at the municipal level. For the estimations in the last two columns, the tax rate vary partly, or completely, at the county level. It therefore seems likely that cluster effects exist at the county level. Indeed, if standard errors are clustered at the county level, the standard errors increase somewhat for the last two columns (results are available upon request). However, because there are only 21 counties, the cluster-robust covariance matrix is unlikely to be correctly estimated. We therefore cluster at the municipal level, but note that the standard errors in the last two columns are likely lower-bound estimates.

[22]In terms of size of the point estimate, a standard deviation increase (decrease) in the county tax rate is associated with a relative increase (decrease) on the probability of voting for the incumbent of around 2.4% for the voters most positive, compared to those least positive, towards the public sector.

confidence in politicians.[23]

Table 3: Voting for incumbent coalition

	Confidence		Coalition seats		Coalition type		
	(1) Low	(2) High	(3) Min.	(4) Maj.	(5) Left	(6) Right	(7) Other
Δ Tax	-0.014	-0.024	0.0093	-0.026	0.016	-0.047*	-0.054
	(0.025)	(0.037)	(0.028)	(0.022)	(0.020)	(0.025)	(0.050)
Pref., $t-1$	-0.019	-0.0045	0.046	-0.0037	0.036***	-0.10***	0.00015
	(0.020)	(0.027)	(0.030)	(0.012)	(0.014)	(0.025)	(0.037)
Δ Tax $\times$ Pref., $t-1$	0.069***	0.018	0.013	0.046***	0.0089	0.054***	0.067**
	(0.016)	(0.021)	(0.010)	(0.014)	(0.012)	(0.018)	(0.028)
Voted inc., $t-1$	0.56***	0.67***	0.67***	0.64***	0.63***	0.64***	0.57***
	(0.019)	(0.022)	(0.022)	(0.015)	(0.019)	(0.025)	(0.034)
Year effects	✓	✓	✓	✓	✓	✓	✓
Municipality controls	✓	✓	✓	✓	✓	✓	✓
Obs.	1,939	1,341	912	3,669	2,468	1,174	939
R^2	0.33	0.48	0.47	0.42	0.47	0.48	0.35

Note: The dependent variable is an indicator for voting for any party in the incumbent coalition. The municipality controls are included both by themselves, as well as interacted with the preference variable. Standard errors, shown in parentheses, are clustered at the municipal level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The first two columns in Table 3 show the opposite pattern to what we expect. The interaction effect is greater for individuals with low confidence in politicians. One explanation for this is that low-trust individuals are more mobile in terms of voting, something that can be seen by past voting behavior being a weaker predictor of current voting behavior.

In many instances, the incumbent coalition does not have a majority of the seats in the municipal council, and can therefore not decide themselves on any tax changes. A question is therefore if voters are less likely to hold minority coalitions accountable for tax changes compared to majority coalitions. In columns 3 and 4, we split the sample according to whether the incumbent coalition has a minority or majority of the seats in the council. The interaction effect is only positive and significant for the latter, suggesting that voters are more likely to hold a majority accountable for tax policy.

Finally, we also split the sample according to whether the incumbent coalition consists only of left-wing or right-wing parties, or whether it consists of other coalitions. Here we find that

[23]The respondents were asked the following: "Generally speaking, how high is your confidence in Swedish politicians? Is it very high, fairly high, fairly low or very low?" The question was asked from 1988 and onwards.

the interaction effect does not exist for left-wing coalitions, but that it exists for right-wing and other coalitions. It is not obvious why this difference exist. For the "other" coalitions, the difference can partially be explained by them almost always being majority coalitions (93% in the sample, compared to 78% for left-wing coalitions). This explanation does not work for right-wing coalitions however, where only 73% are majority coalitions. An interesting avenue for future research would be to explain these differences in reactions to tax policy depending on the political alignment of the coalition in power.

6 Concluding discussion

In this paper, we set out to reach an improved understanding for how voters think about taxes. Do they perceive taxes as going to selfish politicians to collect rents, or do voters see them as financing valuable welfare services? Our point of departure was the political-agency literature where rational voters react to past policies in order to select good politicians or to discipline bad politicians. By investigating whether voters' responses to tax changes differ depending on their preferences for public services, we claim to test whether voters use elections to punish rent-seeking behavior, or as a means to divide funds between public and private consumption. Different from previous studies, we have therefore not focused on average responses in the electorate, but instead on the heterogeneity among voters.

Using survey data where voters are interviewed in two consecutive elections, together with administrative data, we were able to estimate how Swedish voters react to changes in the local tax rate. We find that that voters who prefer a large government sector are indeed more likely to react positively (negatively) to tax increases (decreases), compared to voters who prefer less government spending. This result is true even if we control for past voting behavior and also robust to a number of different sensitivity checks.

If there is one group of voters where we might expect taxes as being seen as indicative of rent-seeking behavior, it would be for voters who have little confidence in their elected politicians. Surprisingly, our findings do not lend support to this conjecture. In contrast, the reaction to tax changes depend to a larger extent on the policy preferences for this group, compared to voters with more confidence in their politicians.

Our conclusion based on our results is therefore that voters do not consider tax hikes to be an indicator of bad incumbent behavior, as suggested in much of the rent-seeking literature. Instead, our findings suggest that responses to tax changes are more likely to follow citizens' preferences for public spending. It should be noted, however, that it is far from clear to what extent this result would translate to different institutional settings. Sweden is a country where support for government intervention is comparatively high, and with low levels of corruption. An interesting

avenue for future research would therefore be whether heterogeneity among voters exist even in other institutional contexts.

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Appendix

A Reforms

During the studied period, responsibilities were gradually transferred from the county level to the municipal level for some welfare services, primarily elderly care. As a consequence of the reforms, the municipal tax rate increased, while the county tax rate decreased with the same amount, leaving the total tax burden unchanged. These reforms took place at different times in different counties.[24]

In our data, we do not observe when these reforms took place, but we observe both changes to the municipal and county tax rates. For us to classify a tax change as due to a reform, two conditions need to be fulfilled: (i) a majority of municipalities within a county and year increased/decreased taxes with the same amount, and (ii) the county tax rate went in the opposite direction. The only exception to this rule is Blekinge län in 1996 where the five municipalities in the county raised taxes with different amounts: 1.74, 2.49, 2.64, 2.74 and 2.75 percentage points. Because the county tax rate was lowered with 1.74 at the same time, we consider the reform to be 1.74. Table 4 shows the reforms for each county and election period.

[24] At a given point in time, a municipality belongs to one and only one county.

Table 4: Reform changes in municipal tax rate[1]

County	82–85	85–88	88–91	91–94	94–98	98–02
Stockholms län	0	0	0	1.8	1.7	0.08
Uppsala län	0	0	0	2.2	1.79	0.19
Södermanlands län	0	0	0	2.67	1.3	0.31
Östergötlands län	0.25	0	0	1.85	1.64	0.16
Jönköpings län	0	0	0	2	1.64	0.19
Kronobergs län	0	0	0	2.75	1.75	0.21
Kalmar län	0	0	0	2.7	2.13	0.23
Gotlands län[2]	0	0	0	0	0	0
Blekinge län	0	0	0	1.95	1.74	0.1
Kristianstads län	0	0	0	2.3	1.65	-
Malmöhus län	0	0	0	2.27	1.34	-
Skåne län	-	-	-	-	-	[3]
Hallands län	0	0	1.5	2.05	0.25	0.23
Göteborgs och Bohus län	0	0	0	3.77	0.19	-
Älvsborgs län	0	0.4	0	2.85	1.46	-
Skaraborgs län	0	0	0	2.7	1.37	-
Västra Götalands län	-	-	-	-	-	[3]
Värmlands län	0	0	0	3.05	1.75	0.2
Örebro län	0	0	0	2.2	1.52	0.2
Västmanlands län	0	0	0	2.9	1.6	0.19
Dalarnas län	0	0	0	3.93	0.12	0.26
Gävleborgs län	0	0	0	2	1.74	0.16
Västernorrlands län	0	0	0	3.05	2	0.24
Jämtlands län	0	0	0	2.55	2.38	0.14
Västerbottens län	0	0	0	2.65	2.25	0
Norrbottens län	0	0	0	3.35	1.37	0.06

[1] No reforms occured 02–06.

[2] Gotlands län has been a municipality and county for the whole time period. It has therefore not been directly affected by the reforms.

[3] In 1998, Kristianstads län and Malmöhus län merged into Skåne län whereas Göteborgs och Bohus län, Älvsborgs län and Skaraborgs län merged into Västra Götalands län. The reform effect for the municipalities in the former Kristianstads län during the period 98–02 was 0.16 and for the municipalities in the former Malmöhus län was 0.13. Similarly, for the counties that merged into Västra Götalands län, the reform effect was 0.43 (Göteborgs och Bohus län), 0.18 (Älvsborgs län) and 0.22 (Skaraborgs län).

B Sampling

The Swedish National Election Study is a survey with high response rates. For the years we analyze, the response rate varied between 69% and 82%. Nevertheless, because we require the respondents to be interviewed in two consecutive elections, the response rate in our sample is lower. Furthermore, not all respondents answer all questions, and we also put restrictions on which municipalities are included in the sample. An important question is therefore to what extent our sample is representative of Swedish citizens.

Figure 6 shows the attrition in the different stages of the survey. In total, there were 13,305 individuals which were randomly selected to be included in the sample for the first time during the election surveys 1982–2002, and eligible for inclusion a second time in the next election (for our studied period 1985–2006). 77% of these answered the survey. However, they did not necessarily answer all questions in the survey because respondents who refused to answer the full survey had the opportunity to answer shortened versions. For the first survey wave, the question we are primarily interested in is the question of preference for public spending. In total, there were 8,420 respondents who stated such a preference.

Out of these, we can match 81% to answers in the following election. The rest is missing, either because they did not answer the second survey, or because their ID number is missing (this is true for 456 observations of the 1988 survey). For the second survey, the question of interest is the vote decision. We are able to use data when either the respondents stated who they voted for, or when registers showed that they did not vote. This restriction further reduces the sample size to 6,464. Therefore, approximately half of the observations remain after all these restrictions have been put in place. Unrelated to individual selection, we also exclude a number of municipalities because they where part of a split or a merger during the studied period, because there was either an unclear majority situation, or because majorities shifted during the election period. These considerations reduce the sample to the final size of 4,749, which is our baseline sample.

To analyze how this attrition affects the characteristics of the respondents, Table 5 shows means of a number of variables for different samples. All characteristics are measured at the time of the first survey. The first column shows data which are available from registers, therefore including individuals who refused, or were unable, to take part in any survey. The second column shows the means for individuals who answered the first survey, whereas column 3 shows the same for our final baseline sample.

In column 4 we reweight the sample based on expected number of respondents per municipality. Let n_{jt} be the number of eligible voters in municipality j at election year t and $\hat{n}_{jt}$ be the

number of respondents in our baseline sample. The weight we use is

$$w_j = \frac{\sum_t n_{jt}}{\sum_j \sum_t n_{jt}} \Big/ \frac{\sum_t \hat{n}_{jt}}{\sum_j \sum_t \hat{n}_{jt}}. \tag{2}$$

That is, we increase (decrease) the weight for respondents from municipalities where fewer (more) respondents than expected were drawn. If the incidence of non-responses vary systematically by municipality, we might expect this reweighting to significantly change the characteristics of the respondents.

The table illustrate how observable characteristics differ between samples. Standard errors of the means are shown in parentheses. Given the large sample size, standard errors are generally very small.[25] The most obvious difference is that non-respondents tend to vote to a lesser extent compared to respondents. Here it should also be noted that the average turnout rate during the studied period was around 83%, meaning that even the original sample (Sample I) does not seem to be completely random. In general, the differences between those who answered the first survey (Sample II) and both (Sample III) are quite small. For the independent variable of interest (public sector preference), the difference is negligible. The reweighting based on expected number of voters at the municipal level (column 4) does not seem to change observable characteristics much. There is therefore no clear evidence of systematic sample selection at the municipal level.

[25]The sample size differs for the different variables due to not all individuals answering all questions.

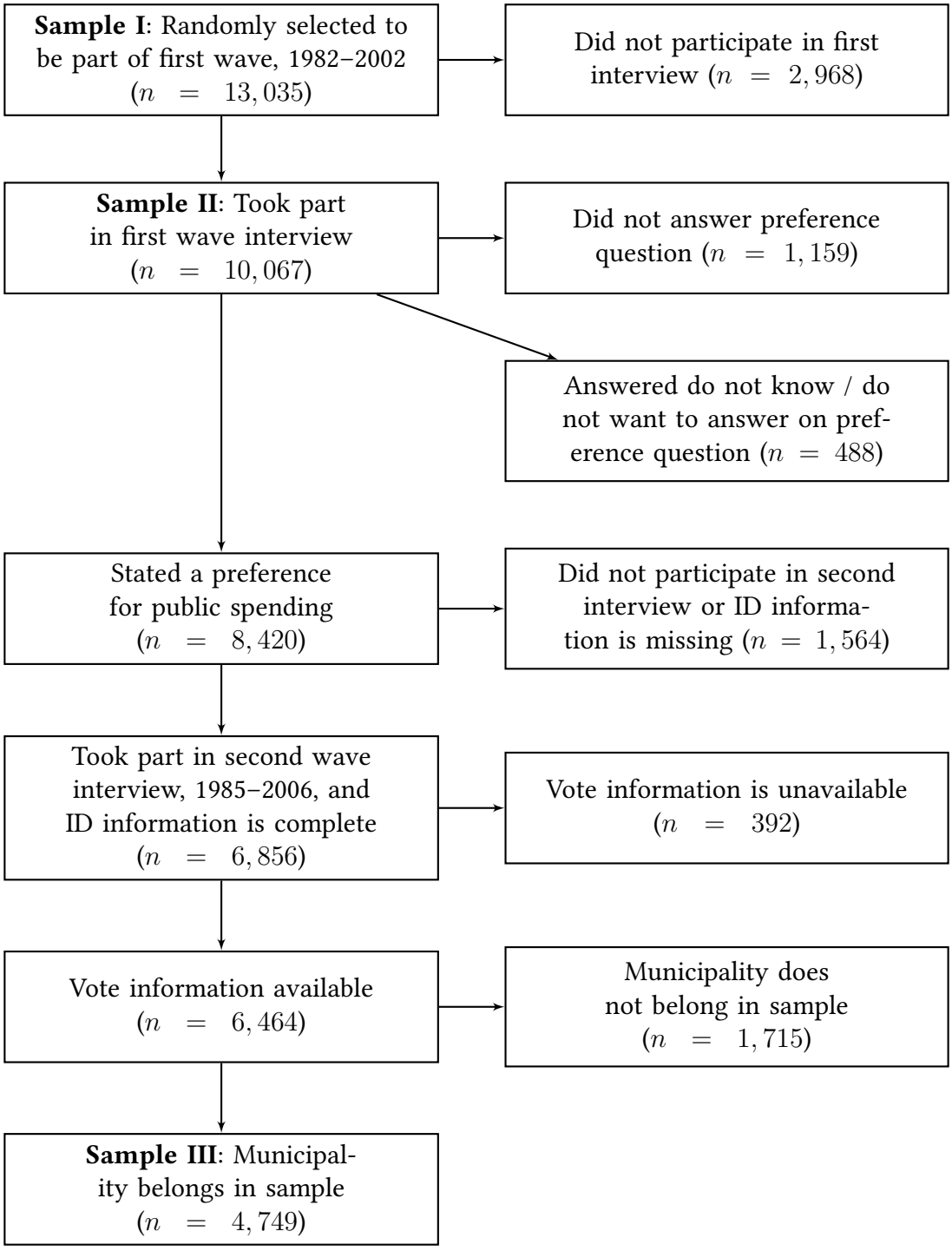

Figure 6: Flow chart of attrition

Table 5: Descriptive statistics of different samples

	(1) Sample I	(2) Sample II	(3) Sample III	(4) Sample III
Voted in municipal election	0.87	0.90	0.93	0.93
	(0.0030)	(0.0030)	(0.0038)	(0.0040)
Age	46.0	45.3	44.1	44.1
	(0.15)	(0.17)	(0.23)	(0.24)
Female	0.50	0.49	0.47	0.47
	(0.0044)	(0.0050)	(0.0072)	(0.0076)
Public sector pref.		0.18	0.19	0.20
		(0.015)	(0.020)	(0.020)
Education level 1		0.23	0.19	0.18
		(0.0044)	(0.0058)	(0.0055)
Education level 2		0.091	0.095	0.091
		(0.0030)	(0.0043)	(0.0043)
Education level 3		0.096	0.090	0.084
		(0.0031)	(0.0042)	(0.0042)
Education level 4		0.065	0.066	0.064
		(0.0026)	(0.0036)	(0.0037)
Education level 5		0.17	0.18	0.18
		(0.0039)	(0.0056)	(0.0060)
Education level 6		0.13	0.13	0.14
		(0.0035)	(0.0050)	(0.0054)
Education level 7		0.22	0.24	0.26
		(0.0043)	(0.0063)	(0.0069)
Cohabiting		0.68	0.71	0.70
		(0.0048)	(0.0066)	(0.0071)
Children living at home		0.36	0.38	0.37
		(0.0050)	(0.0071)	(0.0074)
Do not work		0.33	0.29	0.30
		(0.0048)	(0.0066)	(0.0070)
Work national public sector		0.076	0.083	0.081
		(0.0027)	(0.0040)	(0.0040)
Work local public sector		0.19	0.20	0.20

Table 5: Descriptive statistics of different samples

	(1) Sample I	(2) Sample II	(3) Sample III	(4) Sample III
		(0.0041)	(0.0058)	(0.0061)
Work private sector		0.40	0.42	0.42
		(0.0051)	(0.0072)	(0.0074)
Confidence in politicians		2.29	2.31	2.32
		(0.0088)	(0.012)	(0.012)
Right-left placement		-0.070	-0.034	-0.053
		(0.026)	(0.036)	(0.039)
Voted for V		0.048	0.054	0.058
		(0.0021)	(0.0033)	(0.0038)
Voted for S		0.33	0.35	0.33
		(0.0047)	(0.0069)	(0.0070)
Voted for MP		0.037	0.045	0.045
		(0.0019)	(0.0030)	(0.0032)
Voted for C		0.097	0.11	0.11
		(0.0030)	(0.0046)	(0.0045)
Voted for FP		0.082	0.088	0.089
		(0.0027)	(0.0041)	(0.0044)
Voted for KD		0.036	0.039	0.039
		(0.0019)	(0.0028)	(0.0030)
Voted for M		0.16	0.16	0.17
		(0.0036)	(0.0054)	(0.0058)
Voted for other		0.029	0.036	0.039
		(0.0017)	(0.0027)	(0.0030)
Voted blank		0.015	0.013	0.014
		(0.0012)	(0.0016)	(0.0019)
Vote was unclear		0.071	0.031	0.031
		(0.0026)	(0.0025)	(0.0027)

Note: The table presents the means of a number of variables for the individuals in the different samples (all measured at the time of the first election, see Figure 6 for explanation of the different samples). The standard errors of the means are shown in parentheses. In the fourth column, the sample has been reweighted with municipal weights, for which the standard errors have been adjusted.