

Stockholm School of Economics  
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# **THE IMPACT OF POLITICAL COMPETITION ON DISCRETIONARY SPENDING - EVIDENCE FROM SWEDISH MUNICIPALITIES**

## **Abstract:**

In our thesis we investigate the impact of municipal political competition on discretionary spending by municipal governments. Building on previous work in the field of political economics, we offer a first empirical test of the leviathan and partisan hypothesis in the Swedish context. To test the hypotheses we employ a multiple regression analysis of panel data for 290 Swedish municipalities from 1995-2008. Moreover, we construct a yearly measure of predicted outcomes on municipal politics computed by using polls on national party sympathies at regional level. We find support for the leviathan hypothesis, but only support for the partisan hypothesis in the case of left governments. Thus we conclude that for the Swedish context, the leviathan model is the most relevant. Still, there may be hidden partisan effects for right parties for several reasons we propose. Future research should further investigate the computation of more detailed measures of political competition as well as build theoretical and empirical models that allows for the coexistence of partisan and leviathan effects.

## **Bachelor Thesis**

Andreas Gjelstrup Björdal, 21364\*

Erik Scheller, 20907\*\*

Supervisor: Kelly Regan

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\*21364@student.hhs.se \*\*20907@student.hhs.se

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***Leo McGarry:** I'm sorry but can we really justify spending \$800,000 on 'A Bio-Cultural Approach to the Study of Female Sexual Fantasy and Genital Arousal'?*

***Toby Ziegler:** How can we afford not to?’*

From *The West Wing*

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## 1. Introduction

One of the key features of basic microeconomics is modeling the competitive behavior of rational firms in the marketplace. Disregarding market failures, classic economic theory finds that higher level of competition between firms yields a more efficient outcome. A tight race between competing firms, so to speak, is good for ensuring economic efficiency. Can the same be said of politics? Is a high level of political competition good for ensuring that “efficient” policies are proposed?

This question deserves investigation, particularly in the case of local governments. In Sweden, as much as thirty five percent of public expenditure occurs on the municipal and regional level (Pettersson-Lidbom 2007). Thus, the economic importance of achieving efficient policy outcomes is apparent. At the same time, municipal governance is often less scrutinized, as are local parties. In a recent study, (Erlingsson 2006)(Erlingsson 2006) concludes that the level of corruption in Swedish municipalities has likely increased in the last decade. As Erlingsson points to, corruption is closely linked to local politicians' power to set discretionary spending (Erlingsson 2006).

From a perspective of political economics, this issue can be framed as an issue of political competition. Indeed, from this framework it is the basic principal-agent problem between voters and politicians gives rise to opportunistic behavior. A high level of political competition would increase the incentives for opportunistic politicians to pursue the voters' interests over their own.

Investigating political competition in Spanish local governments, Solé Ollé(2006) concludes that the degree of party competition is closely related to the level of discretionary spending. However, Solé-Ollé also finds support for that left-wing governments are prone to increase spending, whereas right wing governments are inclined to decrease it, given the opportunity to do so. These findings would confirm the so called “partisan hypothesis”.<sup>1</sup> Since no similar studies have yet been conducted in the Swedish context, we, for equal parts curiosity as academics and concern as tax payers, wish to contribute to the further understanding of this issue.

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<sup>1</sup> The leviathan hypothesis being that all parties, regardless of ideology, seek to increase spending when given the opportunity to do so, for example when political competition is low.

### **1.1 Purpose**

The intent of this study is thus to investigate the relationship between the level of political competition and the level of discretionary spending in Swedish municipalities. Therefore, we test the leviathan and partisan models of political competitive behavior. Furthermore, we propose to use the availability of reliable regional polls on voter sympathies to compute a yearly measure of political competition in municipalities. Thus we pose the following research questions:

- Does increased political competition decrease discretionary spending by Swedish municipal governments?
- Do the ideological preferences of the governing party affect the level of discretionary spending?

### **1.2 Delimitation**

The study is limited geographically to consider only Swedish data. It is also limited institutionally to consider the Swedish institutional context at the municipal level. Moreover, the study is limited in time to consider data from the years 1995-2008. In contrast to previous research who often study both spending and taxation, we will only estimate the impact on spending. There are two reasons for this deviation. First, from a theoretical standpoint, the measures are interchangeable; indeed, spending must equal revenue plus change in debt at day's end. Second, previous research shows these measures are highly correlated (Solé-Ollé 2006). Thus for our purpose, and given the scope, we limit our study to investigate the effect on spending.

### **1.3 Disposition**

To investigate our research questions, we will begin by establishing a current state of the research by surveying previous research and our potential contribution in section 2. Next, to illustrate the predictions by the leviathan and partisan models, we will derive these models in accordance with Solé-Ollé's modeling in section 3. Following a general discussion of methodology, the theoretical models will then be converted into econometric models in section 4. To give the reader insight into the properties of our dataset, we will elaborate on data collection and descriptive properties of our dataset in section 5. After the data section, we present and analyze the results from our main regression in section 6. The analysis of results will then be the foundation for our discussion in section 7, where we attempt to interpret our results into their institutional context to assess their validity and to what extent they can be

generalized. Finally, we will summarize our findings in section 8, highlighting conclusions, as well as any limitations to our findings and make proposals for the direction of future research on the subject.

## 2. Previous research

Previous research on how and to what extent political competition affects spending has thus far been inconclusive. Whilst early studies such as Dawson and Robinson ((1963)) conclude that only weak links exist between the two concepts, more recent studies such as Caplan (2001), Besley & Case (Besley, Case 2002), Solé-Ollé (2006) and Bordignon (2003) find support of political competition affecting government fiscal policy, albeit to a varying extent. As Solé-Ollé (2006) points out, the disparity of both theoretical and empirical approaches to the issue may explain this.

To begin with, there is the issue of what assumptions of agents' behavior are most appropriate. Whilst several extensive models of political competition have been developed<sup>2</sup>, the two most relevant hypotheses of modeling in the field are the *Leviathan* and *Partisan* predictions. Essentially, both the *Leviathan* and *Partisan* predictions adopt a pessimistic view of politics and predict that low political competition is adverse for the electorate insofar that partisan will set spending at levels different from voters' desired levels.

In the *Leviathan* setting, all politicians receive rents from being in office proportional to the size of public spending and thus all politicians regardless of party will enlarge government if given the opportunity (i.e. low level of competition). Conversely, in the *Partisan model*, politicians receive rents from putting forth the policy of its partisan electorate. Thus, in a partisan setting, the direction of the political rents are opposite for a left and right party.

The modeling of these hypotheses differ in set-up and formality; on one hand, whilst formal analysis such as Persson and Tabellini (2000) and Lindbeck and Weibull (1987) make for alluring algebra, simpler models such as Solé-Ollé (2006) and Caplan (2010), are more frequently seen in empirical testing; no doubt because they translate more easily into testable empirical models. This disparity between the formal and empirical modeling, combined with differing institutional and cultural contexts, likely is the cause of discrepancies in results. This makes it harder to discuss the external validity of our findings.

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<sup>2</sup> See for example Persson & Tabellini (2000), Lindbeck & Weibull (1987)

Turning instead to previous empirical findings, Solé-Ollé (2006) conducts an extensive panel data analysis based on data 1992-1999 from Spanish municipal governments to test the *leviathan* and *partisan* hypotheses. This is a most relevant study for our purposes since it uses municipal data from a European, multiparty context. Moreover, it employs a theoretical modeling in which the effects of the leviathan and partisan hypotheses are readily compared. In his study, Solé-Ollé (2006) finds that the level of political competition does affect municipal spending, taxation and debt. Solé-Ollé (2006) finds the strongest evidence in favor of the partisan hypothesis, and thus concludes that this is the most relevant model for the Spanish context.

Similarly, Caplan (2001) tests the leviathan hypothesis on US state level data 1950-1989 on state lower house and upper house seats. Caplan concludes that on average, low political competition drives costs. Interestingly, Caplan also finds that, in testing alternatives to the leviathan hypothesis, support for ideological effects. However, since these effects were most clearly present in the case of left-party (Democrats), Caplan (2001) assesses that there might be both leviathan and partisan effects at work simultaneously. These effects would stack in the case of left party, but work in opposite directions in the case of right party (Republicans), thus producing muddled results for right party. However, Caplan (2001) does not develop this notion further, and we have not been able to find other studies that pick up on this notion.

Studies have also been conducted on subsections of the local government. For example, Gardina et al(2009). test if political competition has a disciplining effect on fiscal policy using data from regional health spending in Italy, concluding that increased political competition, indeed, does keep spending at bay.

In the Swedish context, Pettersson-Lidbom (2007) has previously investigated party effects on municipal spending using panel data on Swedish municipalities. With regard to the impact of "partisan" effects on fiscal policy, Pettersson-Lidbom (2007) finds a significant party effect on the levels of spending, taxation and unemployment. For example, Pettersson-Lidbom finds that left wing governments on average spend about 2-3% more of income compared to right-wing governments. However, due to the regression discontinuity design employed in Pettersson-Lidboms study, the effect of party competition cannot be estimated. Still, this could indicate that local parties have *partisan* behavior, even at high levels of competition. We would therefore expect the partisan model to be relevant for our purpose.

Next, Aronsson et al (2000), investigate the expenditure function, testing the median voter model in a cross sectional study of Swedish municipalities. They find that this model indeed is relevant in the Swedish context. Thus, Aronsson et al study constitute previous research on the determinants of public spending in a Swedish context.

In summary, a brief survey of previous research in the field shows that no previous research is available on the Swedish context. In an international context, the key questions have been investigated previously, using local and regional data in both American and European contexts. However, due to a disparity of modeling and measurement of political competition, there is no established consensus on whether the partisan or leviathan models best describe the impact of political competition.

## **2.1 Contribution to research**

As the first study, to the best of our knowledge, on the effect of the level of political competition on discretionary spending of local governments in Swedish municipalities, we may contribute specifically to knowledge concerning the economic impact of the level of political competition in the Swedish context. Moreover, our study contributes in general to an updated understanding of the economic behavior of Swedish municipal governments, using a new dataset.

In relation to international research, we contribute with our empirical analysis by testing a measure of political competition based on predicted municipal election results for each municipality and year thus increasing variation in political competition. Thus our study offers a new take on the applicability of the leviathan and partisan hypotheses in a municipal setting, using more detailed data on political competition.

As is evident from previous research, the field of political economics is abounding with formal modeling.<sup>3</sup> However, we assess that our best possibility of making a contribution lies not in the development of another model. Rather, we chose to stay close to one specific modeling, namely that of Solé-Ollé, and use instead new empirical data as well as a more detailed measure of political competition to assist in evaluating the ongoing development of the field at large.

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<sup>3</sup> Compare to (Persson, Tabellini 2000)

### 3. Theory

Let us begin with outlining the necessary theoretical framework in order to provide a theoretical context to the *leviathan* and *partisan* models. These are subsequently derived, whereby their respective predictions can be identified. But first, a brief introduction of the field of political economics.

#### 3.1 Theoretical framework

Political economics is the overarching name for the subfields of public choice, public finance and rational choice ((Persson, Tabellini 2000)). It should be noted, straight out, that this field is far from unified, yet using this perspective allows us to apply some fundamental insights of economic theory in modeling electoral competition ((Persson, Tabellini 2000)).

Our theoretical starting point is a probabilistic model of electoral competition. This model differs from the classic downsonian model<sup>4</sup> first and foremost in that voters may be influenced by other factors than their preferred economic policy ((Persson, Tabellini 2000)). In a probabilistic voting model, parties announce policy platforms, and voters may abstain voting and be influenced in by other factors than their own economic benefit from the proposed policy platforms (Persson, Tabellini 2000).<sup>5</sup> This means that the central prediction of the median voter theorem does not apply, insofar that the median voter is not necessarily decisive for policy decisions.<sup>6</sup> This is a major advantage of a probabilistic model, considering the formal and empirical shortcomings of the median voter theorem and its associated downsonian model of electoral competition. Furthermore, it guarantees that an equilibrium solution can be found, regardless of dimensionality of voter's policy preferences (Persson, Tabellini 2000). Simply put, this is a more realistic modeling of voter behavior than the downsonian model of electoral competition (Persson, Tabellini 2000).

Next, having decided upon employing a probabilistic voter model, there are two major views on the impact of political competition that can be identified from public choice theory. To begin with, there is the view, exemplified here by the *leviathan* and *partisan* models,

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<sup>4</sup> The Downsian model is based on the notion of spatial electoral competition over a single dimension. We assume two parties and a mass of voters with single peaked symmetric preferences on the one dimension of the size of public spending. For further discussion of the downsonian model of electoral competition see Roemer((2001)). For a summary of the critique and defense of the downsonian electoral model see Branson ((Bronson, Allen 2004)) and Stigler ((Stigler 1972))

<sup>5</sup> E.g. ideology, compare to, (Caplan B 2001, Persson, Tabellini 2000).

<sup>6</sup> The median voter theorem was first developed by Duncan Black (1948). However, it is closely linked to the spatial model of electoral competition, as developed by Hotelling (1929) and Downs (1957).

which claim that it is low levels of competition that creates inefficient policy outcomes. This views politicians as utility maximizers who, either out of rents from being in office and the size of the public spending (*leviathan* model), or out of their partisan policy preferences (*partisan* model), set policy different from the voter's optimum. George J. Stigler was a strong proponent of this view. Investigating the similarities of economic and political competition (Stigler 1972) he concludes that the common function of political and economic competition is to keep the rents of politicians in check.<sup>7</sup>

However, there is also theory in political economics which claims that it is high levels of political competition that offset spending from the optimum level. For example, a higher voter turnout in a competitive race may raise the proportion of voters with lower income, who often favors high spending.<sup>8</sup> Consequently, a higher level of competition could increase spending due to shifting median voter preferences (towards more spending). Also, we may consider interest group theory, which claims that a close race would focus disproportionate attention to those voters most likely to swing (so called swing-voters), be it sub-urban middle class families, senior citizens, or young voters. This implies greater accommodation to special interest groups, who demand spending which benefit their interests, and thus higher level of competition would lead to higher spending (See(Austen-Smith 1987)and (Mueller, Murrell 1986)We will not, however, conduct explicit modeling of interest group theory. Rather we regard this view as a basis for generating non-null hypotheses, and for criticizing our findings.

### 3.2 The Leviathan and Partisan models

The leviathan model regards all parties, regardless of ideology, as maximizing rents from being in office, so called "ego rents", and rents proportionate to the size of government spending (Persson, Tabellini 2000), called "leviathan rents". As such, parties have incentives to, at all time increase the size of the public sector. In the leviathan model, higher taxes and a higher level of public spending can directly be translated to more rents for the party in power. However, according to Persson and Tabellini (2000), efficient outcomes may be achieved in spite of leviathan type parties; the inclination to increase spending must be weighed against the increased probability of losing voters because of spending diverging from voters' preferred level. Indeed, provided the level of political competition is sufficiently high, party's

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<sup>7</sup> For example (Wittman 1995) also considers political competition a principal mean of ensuring accountability by reducing the principal-agent issue at hand.

<sup>8</sup> Compare with (Saint-Paul 1996)

rents will be driven towards zero through a process akin to Bertrand competition (Persson, Tabellini 2000).

The partisan model takes a different view and regards politicians and political parties as promoting different ideologies (Persson, Tabellini 2000). Instead of receiving rents proportional to the size of government, they receive benefits from enacted partisan policy. For all practical purposes, this can be viewed as left wing governments receiving positive rents from increased spending, whereas right wing governments receive positive rents from decreased spending. In this case, a higher degree of competition leaves less room for the winning party to impose its preferred partisan policy (Persson, Tabellini 2000). In other words, a high level of political competition means that right wing parties will be unable to push spending down as much as they want while left wing parties cannot increase spending to the degree they want.

### 3.3 Key assumptions

Having chosen to employ the leviathan and partisan models still are several ways to set up a probabilistic model of electoral competition.<sup>9</sup> For reasons of clarity, consistency and comparability of results, we chose to use the probabilistic model used by Solé-Ollé (2006). This model involves two classes of players: parties and voters. In order to derive model we must make some critical assumptions about the player's behavior. We will revisit these assumptions in our model critique (section 3.5)

#### 3.3.1 Parties and politicians

Fundamentally, we assume that parties are rational agents. Also, we treat parties as having internally uniform and coherent preferences. Hence, parties are "well behaving" rational agents in our modeling. Thus, parties use expected values of outcomes to evaluate strategies for maximizing their own utility. Moreover, we assume that there are only two parties, or solid political blocks, and that all spending is financed through taxation.

In the *leviathan* model, we further assume that parties are opportunistic in the sense that they only care for being in office and the associated rents with public expenditure (Persson, Tabellini 2000). While in office, parties receive two types of rents, ego-rents, and *leviathan*-rents. Ego rents are unrelated to size of government whilst leviathan rents are directly related to budget size (Solé-Ollé 2006, Persson, Tabellini 2000)

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<sup>9</sup> Compare for example Weibull & Lindbäck(1987), Caplan(2001), Dixit & Londregan(1998), Persson Tabellini (2000)and Sole-Olle(2006)

In the *partisan* model, parties are instead assumed to care for the type of policy enacted in that they favor different levels of public expenditure as a function of their ideological preferences (Solé-Ollé 2006). As such, parties receive utility corresponding to how well the enacted policy corresponds to the parties' preferences, regardless of what party is in office.

### **3.3.2 Voters**

In accordance with Solé-Ollé (2006), and similar to Lindbeck and Weibull (1987), Persson and Tabellini(2000), we assume that voters are rational and identical except for difference in preferences of party. Thus, the voters are inherently "partisan" to a varying degree, but can be swayed to swing if given sufficient incentives. Also, we assume that voters are identical in all other regards, including income, and have quasi-linear utility functions. We also assume voters to be distributed along a continuum of real numbers  $\varepsilon$ , where  $\varepsilon$  denotes a given preference for party  $R$  over party  $L$  (voters differ only in this aspect). The density function of voters' preferences over range  $\varepsilon$ ,  $f(\cdot)$ , is assumed to be symmetric and single peaked with mean  $\bar{\varepsilon}$ . While this makes for a rather rudimentary modeling, as will be shown, this suffices to obtain theoretical predictions consistent with the predictions of more complex models (Solé-Ollé 2006)

### **3.3.3 Political competition**

We assume that political competition is played out in terms of policy proposals. In this case, we assume that parties make binding commitments to political platforms which only vary in terms of the proposed overall size of public expenditure. As we will show, different citizens derive different utility from these proposals depending on their preferences for parties. Moreover, for our theoretical model we assume parties to participate in a plurality election (Solé-Ollé 2006) This implies simply that the winner of the election is the party with the most votes which also holds all power in office (i.e. winner-takes-it-all). Also, this allows us to simplify the conditions that drive competition, insofar that parties under these assumptions (in the leviathan model) only receive rents if winning the election.

### **3.3.4 Order of play**

To conclude this section, allow us to outline how the game of electoral competition is played in this setting (Solé-Ollé 2006, Persson, Tabellini 2000). First the competing parties make, simultaneously and non-cooperatively, publicly known, binding commitments to their respective platforms. Then, elections are held where voters vote to maximize target function

considering both utility of policy platforms and other relevant factors. Last, parties implement announced policy platforms.

### 3.4 Deriving the leviathan and partisan hypothesis

Given the aforementioned assumptions, we may now formally derive the leviathan and partisan hypotheses. This derivation closely follows the work of Sole-Olle(2006). As before, this is because of comparability, consistency and clarity. The two parties, called  $R$  and  $L$ , compete for office by making simultaneous, non-cooperative, and binding commitments regarding the level of government spending,  $e^L$  and  $e^R$ . We can express voter utility as:

$$v(e) = u(y - e) + \mu(e)$$

Where

$v$  = utility

$y$  = income

$e$  = government spending

Thus, voter utility decreases with the level of taxation (the first term) and increases with government spending (the second term). Next, define voters' optimal level of spending:

$$v_e(e) = \mu_e - u_y = 0$$

That is, voters prefer spending to be set so that marginal utility of public spending equals marginal utility of private spending. This will be our benchmark for the spending predictions of the leviathan and partisan model developed beneath.

Voters weigh increased utility from  $e^L$  against their partisan preference for party  $R$ . A voter will thus vote for party  $L$  iff  $v(e^L) - v(e^R) > \varepsilon$ . Thus, there will be a cut-off point,  $\varepsilon_i = v(e^L) - v(e^R)$  indicating the share of voters voting for party  $L$ . Assuming a single-peaked, symmetric distribution of preferences; we find that the mean  $\bar{\varepsilon}$  is also the median. This is the median/mean voter's preference for party  $R$ . Thus, share of votes for party  $L$  is  $F(v(e^L) - v(e^R) - \bar{\varepsilon})$ . The parties maximize expected rents according to:

$$v^L(e) = F(v(e^L) - v(e^R) - \bar{\varepsilon})(r + \gamma \cdot e^L)$$

$$v^R(e) = (1 - F(v(e^L) - v(e^R) - \bar{\varepsilon}))(r + \gamma \cdot e^R)$$

Where

$F(\bullet)$  = cumulative frequency distribution over  $\varepsilon$

$r$  = ego rents

$\gamma$  = leviathan multiplier

$\varepsilon$  = voter preferences for party  $R$  over  $L$

The first term is the probability of winning, while the second is the leviathan and ego rents from being in office. According to Persson & Tabellini (Persson, Tabellini 2000), it can be shown that under this setup, the parties' platforms will converge to form a Nash equilibrium where the electoral platforms are equal (i.e. proposed spending is equal). F.O.C for party L is:

$$f \cdot v_e(e^L) \cdot (r + \gamma \cdot e^L) + F \cdot \gamma = 0$$

Two predictions arise from this. First, in equilibrium, the proposed spending will exceed the median voter's preferred level of spending given  $\gamma > 0$  (implying that  $v_e(e^L)$ , voter's marginal utility from public spending is negative in equilibrium). Second, an increase in the level of political competition, modeled as an increase in  $f(-\bar{\varepsilon})$ , raises the parties cost of increasing spending beyond voters' optimum ( $f(-\bar{\varepsilon})$  is the density of voters, in equilibrium, who would shift to party R at an increase in spending).

In a partisan model, the parties derive utility not from being in office but from policy outcomes (Solé-Ollé 2006, Persson, Tabellini 2000) This can be expressed as:

$$v^L(e) = u(y - e) + \mu((1 + \alpha)e)$$

$$v^R(e) = u(y - e) + \mu((1 - \alpha)e)$$

Where

$\alpha$  = "ideology coefficient"

This means that the parties receive different marginal utility of public spending than the voters. For party L, marginal utility is higher, and for party R marginal utility is lower. Accordingly,  $v_e^L > v_e^V > v_e^R$ . First order conditions of the expressions above become:

$$v_e^L = \mu_e(1 + \alpha) - u_y$$

$$v_e^R = \mu_e(1 - \alpha) - u_y$$

Given the assumptions about voter behavior, party objectives can be written as:

$$v^L(e) = F(v(e^L) - v(e^R) - \bar{\varepsilon}) \cdot v^L(e^L) + (1 - F(v(e^L) - v(e^R) - \bar{\varepsilon})) \cdot v^L(e^R)$$

$$v^R(e) = (1 - F(v(e^L) - v(e^R) - \bar{\varepsilon})) \cdot v^R(e^R) + F(v(e^L) - v(e^R) - \bar{\varepsilon}) \cdot v^R(e^L)$$

Where

$F(\bullet)$  = cumulative frequency distribution over  $\varepsilon$

$\varepsilon$  = voter preferences for party R over L

The first term in both equations above represents the expected utility gained if the party wins the election (and sets the level of spending) while the second term represented the expected utility of losing the election (and the other party sets the level of spending).<sup>10</sup> First order conditions of the expressions above become:

$$v^L(e) = f \cdot v_e \cdot (v^L(e^L) - v^L(e^R)) + F \cdot v_e^L = 0$$

$$v^R(e) = f \cdot v_e \cdot (v^R(e^R) - v^R(e^L)) + (1 - F) \cdot v_e^R = 0$$

Where

$f(\bullet)$  = the density of  $F(\bullet)$  as defined above

Considering the F.O.C. for party  $L$ , the first term in the equations above represents the increased probability of losing the election due to spending levels set too high above the voters' preferred level. The second term represents the increased utility of the higher level of spending.

In the partisan model, there will be an equilibrium with policy divergence<sup>11</sup> ( $e^L \neq e^R$ ), although voters' utility will be equal from the alternatives ( $v(e^L) = v(e^R)$ ). Thus, full convergence in terms of utility is achieved at equilibrium, even though policies diverge. An increase in the level of competition,  $f(-\bar{e})$ , will decrease spending for left wing governments and increase spending for right wing governments, since the cost of not pursuing voters preferred level increases (Solé-Ollé 2006).<sup>12</sup> Note that if there is not binding commitments, each party will diverge fully from voters preferred level (Solé-Ollé 2006).

In summary, we have shown two models and their predictions of the level of political competition will impact discretionary spending. In the *leviathan* model, party ideology makes no difference, since all parties care for are rents associated with being in power and will thus set spending above preferred level. In contrast, the *partisan* model of party competition predicts that parties will differ symmetrically around the preferred level of spending.

<sup>10</sup> Indeed, in this case, the losing party does gain utility even if not in office.

<sup>11</sup> Since the second term of the F.O.C is positive, the first must be negative. Consequently,  $e^L > e^R$  and  $v_e^L < 0$  for party  $L$  ( $v_e^R > 0$  for party  $R$ ).

<sup>12</sup> In order to maintain the F.O.C. when  $f(-\bar{e})$  increases, the party will increase (decrease) its proposed level of spending in order to reduce the probability of defeat.

### 3.5 Model critique

Whilst our theoretical model does have many advantages, not least its parsimonious and consistent rendition of the *leviathan* and *partisan* hypotheses, it does have some points of potential shortcomings, both from a theoretical and empirical standpoint.

First, whilst the model is a probabilistic model of electoral competition, it is based on rather simplistic assumptions. The triviality that voters in reality do vary in income (which often implies tailed distributions in most cases) and preferences on more issues than party ideology means that the assumption of single peaked, symmetric distribution of preferences on a single dimension (inherent party preference) is unrealistic and may yield invalid conclusions (Bronson, Allen 2004).

Second, as Bronson ((2004)) point out, the idea that local politicians are able to accurately measure the density of voters at swing, and thus gauge public opinion perfectly is not very plausible. The same can be said for the assumption of internally uniform and coherent parties, which any politician or political scientist would tell you, is simply absurd. For example, internal party competition may be fierce even though external competition is not. Whilst we cannot say how the presence of internal competition would impact the model, it would imply that the parties optimization problems are only approximately representative. However, as previous research shows, even simplistic theoretical modeling of political behavior may yield predictions consistent with empirical results (Bronson, Allen 2004, Roemer 2001).

Moreover, the assumption of only two parties may seem unrealistic, and rightly so. Indeed, outside of the US context, most democracies feature more than two competing parties (Hague, Harrop 2007). This is often more so on the local level, where local parties may also be present. The reason for this is simply that multiparty models are much more complicated to develop and even more complicated to test empirically, often requiring advanced statistical methods to account for inherent complexity.<sup>13</sup>

The assumption that spending is increased solely through taxes is also somewhat unrealistic. However, according to Solé-Ollé, it does not affect the central predictions of the model, which we have confirmed by comparing to e.g. Persson & Tabellini (Persson, Tabellini 2000). Thus we will keep things clear and consistent by not relaxing this assumption.

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<sup>13</sup> Compare e.g. (Adams 1999)

Moreover, there is the issue of how reasonable it is that the concept of political competition is measured by  $f(-\bar{\epsilon})$ . This is not a question of how reasonable it is that spending depends on the density of voters who would change block at equilibrium (which we previously considered). Rather, we are questioning how well this measure corresponds to the concept of political competition, which potentially holds a multitude of interpretations. However, if we take a “level perspective”, we consider that the level of political competition as a concept indeed does fits with the model. Thus we should keep in mind to view political competition here in a narrow fashion.

In applying this theoretical framework, we also need to acknowledge the restrictions facing local politicians in comparison to their colleges on the national level. Boyne (1996) list several reasons why competition on the local level may be less significant for economic policy than competition at the national level. First, some local governments meet no real competition from other parties in the sense that “local political monopolies” may exists. Second, the incentives to engage in tough competition are weaker on the municipal level because of smaller rents for local politicians.<sup>14</sup> Moreover, election outcomes in local election are largely driven by of swings in party opinions on the national level (Holmberg 1993). Last, as Boyne (1996) notes, local politicians are limited by national politics in what positions to take.

Indeed, these possible limitations to the role of local political competition may dampen the effect of political competition on spending in the municipal setting and decrease the intensity of competition. Still, overall there are no general features of municipal politics that would lead us to believe that our modeling would not apply to our chosen data or yield invalid results *prima facie*.

Therefore; we believe that whilst our model is relatively rudimentary, it will yield predictions consistent with more advanced modelling. Moreover, considering the empirical focus of this study, an instrumental view on formal modelling leads us to conclude that indeed, without further caveats, the model is best judged by its ability make correct predictions, and without further ado, we move on to empirical method.

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<sup>14</sup>For example, salaries and other sources of rents are lower at local level compared to regional and national level.

## 4 Method

In this section, we outline the methodological framework of the study, and evaluate the method's impact on reliability and validity. Next, the theoretical model and its predictions are made operative by specifying relevant econometric models and deducing testable hypotheses.

### 4.1 Methodology

To attack the research question, we employ a hypothetico-deductive (H-D) method akin to the natural sciences approach to economics prescribed by Popper ((Redman 1993) Thus we employ an essentially positivistic<sup>15</sup> epistemological (Bryman 2008). This view of knowledge serves as a philosophical underpinning for the validity of our method. Also, the method is frequently employed in the field of economics (Redman 1993). The H-D method, simply put, is the view that hypotheses and evidence are confirmed by their logical consequences. Thus the H-D method considers a hypothesis confirmed I logically entailed and verified evidence can be found.<sup>16</sup> We translate this logic to the following steps:

1. Theoretical framework provides foundation for theoretical modeling of research question
2. Theoretical modeling generates theoretical predictions
3. Theoretical predictions are used operatively as hypotheses
4. Theoretical modeling is used as basis for empirical modeling
5. Hypotheses are tested empirically in attempt to falsify
6. Results are compared to hypotheses and analyzed for generating conclusions

Using this overarching methodology, we employ a quantitative, econometric research strategy in investigating the hypotheses proposed. In order to provide the best possible answer to our research questions, a research design based on panel data is the most suitable. There are several reasons for this (Baltagi 2008). First, panel data allows control for individual heterogeneity. Since Swedish municipalities are expected to be heterogeneous, a time series or cross sectional approach alone would most likely not provide unbiased estimates (Baltagi 2008). Also, using panel data will allow us to control for time and municipal-independent

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<sup>15</sup> Adhering to the principles of *deductionism*, *inductionism* and *phenomenalism*; i.e. that we can, by using deductive and/or inductive logic, arrive at true conclusions regarding what we can observe with our senses. (Bryman 2008)

<sup>16</sup>On a more technical note, (Grimes 1990) shows that the logic of the H-D method is most fruitfully shown as “ $e$  confirms  $h$  if (1)  $e$  is true, (2)  $h$  and  $\sim e$  are each consistent, and (3) [ $h$  is a narrow consequence<sup>16</sup> of  $e$ ,]  $h \rightarrow e$ ”

variables. Moreover, intuitively it seems appropriate to use panel data if one is to find an effect of political competition on municipal expenditure that is valid across place and time. Also, using panel data allows for using more detailed measures and municipal effects. Consequently panel data may avoid bias from data aggregation compared to using aggregated time series (Baltagi 2008).

Using panel data is not without difficulties however. As Bryman(2008) argues, all longitudinal undertakings face the issue of attrition and/or non-response. Even though non-response is avoided to a large extent since municipalities are obliged to submit data to government authorities, attrition could occur since municipalities can be merged and split over time. As we will show, however, this attrition is absent in our data. In summary, we therefore assess that a panel data design is the most appropriate design for this study.

## 4.2 Empirical framework

Now that our methodological foundations have been established, we move on to specifying our econometric models. Upon doing so, we also add a specification for the instance that politicians do not make binding commitments. Last we will build a set of determinants which are believed to have a significant impact on our model.

### 4.2.1 Empirical models

In constructing the empirical framework, our starting point is the *leviathan* and *partisan* models of political competition. Again, and for reasons previously stated, we follow by and large the modeling proposed by Solé-Ollé (Solé-Ollé 2006). In both these models, we show that the parties have a target level of spending,  $e^T$ . In the case of perfect political competition we find that:  $e_{i,t}^T = e_{i,t}^V$ , where  $e_{i,t}^V$  denotes voter's target level of spending.  $e_{i,t}^V$ , in turn, is a linear function of its determinants, denoted  $X_{i,t}$ . Thus:  $e_{i,t}^V = X_{i,t}$ , where  $X_{i,t}$  is a vector of determinants (listed below), which are linear in parameters (thus each variable has its own coefficient, multiplied by rho). The coefficients on these variables (obtained by dividing the estimated coefficient by rho) represent the long run impact on spending of a change in one of the variables (Solé-Ollé 2006).

Next, using the partial adjustment model<sup>17</sup> proposed by Solé-Ollé (2006), budgetary decisions by the local government are set adaptively with regard to voters' target level and

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<sup>17</sup> We model government behavior as partially adaptive with regards to desired spending. Thus fiscal variables are only adjusted a portion of the difference between lagged spending and target spending. Compare Solé-Ollé ((2006)) and Say et al. ((Seay 2004)).

lagged level of spending. This is our target expression into which we will substitute parties target level(s). This gives:

$$e_{i,t} = \alpha_{0,t} + \beta_{i,0} + (1 - \rho)e_{i,t-1} + \rho e_{i,t}^T + \varepsilon_{i,t} \quad (1)$$

Where  $e_{i,t-1}$  previous year's level of is spending,  $\rho$  represents the part of imbalance between target level and lagged level,  $t-1$ , that will be adjusted in spending at time  $t$ . Where  $\beta_{i,0}$  is a municipality fixed constant.  $\alpha_{0,t}$  is the constant which is allowed to be different for each year and  $\varepsilon_{i,t}$  is a well behaved error term, apart from being heteroskedasticity (Solé-Ollé 2006).<sup>18</sup>

Next, let us introduce the testable models based on the *leviathan* and *partisan* predictions are adapted to fit the empirical model. Starting with the *leviathan* model, we find that the target level of local government spending,  $e_{i,t}^T$ , is higher than the voter's preferred level,  $e_{i,t}^V$ , by an amount proportional to the level of competition,  $\omega_{i,t}$ . This can be shown as:

$$e_{i,t}^T = e_{i,t}^V + \gamma_0 \omega_{i,t} \quad (2)$$

Where  $\omega_{i,t}$  is the degree of political competition, where  $\omega_{i,t} = 0$  represents maximum level of political competition.  $\gamma_0$  is the "leviathan coefficient", and is expected to be positive (Solé-Ollé 2006). This represents the marginal increase in spending from a change in the level of political competition. Substituting (2) into (1) gives non-linear specification:

$$e_{i,t} = \alpha_{0,t} + \beta_{i,0} + [(1 - \rho)e_{i,t-1} + \rho(X_{i,t} + \gamma_0 \omega_{i,t})] + \varepsilon_{i,t} \quad (3)$$

As Solé Ollé(2006) notes, the only essential advantage of a non linear model as described above to a linear version is that the long run parameters standard errors can be estimated. For simplicity we therefore choose to instead estimate the linear specification:

$$e_{i,t} = \alpha_{0,t} + \beta_{i,0} + (1 - \rho)e_{i,t-1} + \rho X_{i,t} + \rho \gamma_0 \omega_{i,t} + \varepsilon_{i,t} \quad (4)$$

By estimating this equation, we obtain  $(1 - \rho)$ . This gives us  $\rho$ , which in turn gives us the size of the long run coefficients on  $X_{i,t}$  and  $\omega_{i,t}$  by simple division. Note that the coefficient on  $\omega_{i,t}$ , adjusted for  $\rho$ , is  $\gamma_0$ . The estimated coefficients on  $X_{i,t}$  are the coefficients on the determinants each multiplied by  $\rho$ .

Similarly, the *partisan* model can be adapted to test its theoretical predictions. Since in the *partisan* model, the two parties, in this case party blocks, are assumed to respond in opposite directions to a change in spending (Solé-Ollé 2006). Thus:

$$e_{i,t}^T = e_{i,t}^V + [\gamma_0 \theta_{i,t} + \gamma_1 (1 - \theta_{i,t})] \times \omega_{i,t} \quad (5)$$

<sup>18</sup> Overall, we apply the standard time series assumptions for OLS regression analysis as shown in Wooldridge ((Wooldridge 2009))

Where  $\theta_{i,t}=1$  for left government elect, else 0. Consequently,  $(1-\theta_{i,t})=1$  for right government, else 0. The  $\gamma$  coefficients are the “partisan coefficients”, and are expected to be positive and negative respectively ( $\gamma_1 < 0 < \gamma_0$ ). In the case of maximum political competition, spending outcome is the same as in the leviathan model, regardless of which political block is in power. If competition is lower than maximum level ( $\omega_{i,t} > 0$ ), the target level is higher than the voter’s preferred level if a party L (party R) is in place. Substituting (5) into (1) gives testable partisan specification:

$$e_{i,t} = \alpha_{0,t} + \beta_{i,0} + (1 - \rho)e_{i,t-1} + \rho[X_{i,t} + (\gamma_0\theta_{i,t} + \gamma_1(1 - \theta_{i,t})) \times \omega_{i,t}] + \varepsilon_{i,t} \quad (6)$$

As above, this can be linearized as:

$$e_{i,t} = \alpha_{0,t} + \beta_{i,0} + (1 - \rho)e_{i,t-1} + \rho X_{i,t} + \rho\gamma_0\theta_{i,t}\omega_{i,t} + \rho\gamma_1(1 - \theta_{i,t})\omega_{i,t} + \varepsilon_{i,t} \quad (7)$$

Thus far, we have assumed that commitments to policy platforms are binding. However, it might be so that commitments are not binding (Solé-Ollé 2006, Persson, Tabellini 2000). In this case, we find that, given that parties have partisan preferences, it is not surprising to find that there will be equilibrium with full policy divergence. In other words, parties will make promises to win office, then break these promises and set policies to maximize their own utility based on their partisan preferences. This gives our “mixed model” specification, which allows us to discern the party effect whilst controlling for the level of competition:

$$e_{i,t} = \alpha_{0,t} + \beta_{i,0} + (1 - \rho)e_{i,t-1} + \rho X_{i,t} + \rho\gamma_0\omega_{i,t} + \rho\gamma_1\theta_{i,t} + \varepsilon_{i,t} \quad (8)$$

#### 4.2.2 Testable hypotheses

We may now express the specific testable hypotheses, which are the operationalization of the theoretical predictions. Besides the leviathan and partisan hypotheses, we may also formulate an alternative hypothesis, in line with interest group theory predictions, in that increased competition increases spending. This is simply included for completeness and to provide for a suitable alternative.

|                         |                                                     |
|-------------------------|-----------------------------------------------------|
| Null hypothesis:        | $H_{null} : \gamma = 0, \gamma_0 = 0, \gamma_1 = 0$ |
| Leviathan hypothesis:   | $H_{lev} : \gamma_0 > 0$                            |
| Partisan hypothesis:    | $H_{part} : \gamma_0 > 0, \gamma_1 < 0$             |
| Mixed hypothesis:       | $H_{lev} : \gamma_0 > 0, \gamma_1 > 0$              |
| Alternative hypothesis: | $H_{alt} : \gamma_1 < 0$                            |

#### 4.2.3 Notes on specifications

We must consider the potential issues with using fixed effects. Although Solé-Ollé recognizes the importance of municipality specific effects, he specifies his population model as only including years specific fixed effects<sup>19</sup> due to the limitations in variation of the explanatory variable of interest because too few actual elections (only two elections) are included in his data. This is a major drawback when using actual election results, which remain constant for four consecutive years. Essentially, having the political competition variable constant over several years sequentially would make this variable sensitive to the introduction of fixed effects (which are also constant over several years). This issue illustrates the need to pursue a different approach to measuring political competition.

One must also consider that the linear in parameters specification of Solle Olle's model implies that the parameter  $\rho$  must be removed from the coefficients by means of division. This means that the standard errors on the long term coefficients are not reliable. However, significance levels are unchanged.

Caveats aside, we would suggest that fixed effects for time independent effects are indeed relevant to use. Intuitively, there are several unobserved factors which could influence voter demand for spending as well as the impact of political competition. For example, we could expect that local political culture is unobserved, municipality specific and relatively constant over time, yet likely correlated with both the explained variable and other explanatory variables. Thus, including fixed effects would allow us to control for such unobserved variables. Most importantly, we believe that using four actual election outcomes (compared to Sole Olle using two elections), disregarding our computed measure with year-by-year predictions of electoral competition, we have may test using municipal specific effects in all our econometric specifications.

#### 4.2.4 Voter demand variables

In selecting determinants,  $X_{i,t}$ , a balance must be struck between consideration of the empirical context, namely Swedish municipalities, and determinants established by previous research. Our starting point is the determinants as shown by Sollé-Ollé (2006). We modify this list based on their relevance to the Swedish context and availability of data. Solle Olle uses controls for *income per capita*, *property value*, *current governmental transfers per head*,

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<sup>19</sup> Which is why we have also chosen to use this specification when outlining the empirical model

*level of capital transfers per head, debt charges per capita, population size (dummy form), share of young and share of old.*

First, *property value* is not relevant as a determinant in a Swedish context as property tax was not a source of municipal revenue in Sweden until 2008. However, once the property tax largely was transferred to municipalities, the municipal revenues were not estimated to increase before 2009.<sup>20</sup> Furthermore, this has no basis in previous research in the Swedish context (see for example (Aronsson 2000)). Next, we chose to replace *income per head* by the measure *tax base*. Tax base (“skattekraft”) is defined as “taxable income from employment of citizens based on previous year’s income declaration” (Kommundatabasen). In the Swedish context, *governmental transfers* are calculated based on a composite measure including several other variables, including tax base and age structure. This would indicate high correlation between government grants and other controls. However, because several of the measures included in the calculation of government grants are not available as separate variables from public databases, we believe that government grants will not be perfectly correlated with any of the other controls, thus reducing the risk of high of inflated standard errors due to multicollinearity. Rather, it will act as a proxy for these demographic and otherwise unobserved (unavailable) cost drivers. Thus, we include a measure of *government transfers per head*.

We have not been able to obtain a consistent measure of *capital grants*, because such grants are relatively uncommon as discrete municipal grants, and because no systematic and reliable compilation of such grants over the specified time period is available to us. However, as Pettersson-Lidbom (Forthcomming) shows, they may have a significant impact on the fiscal discipline in the municipalities since they soften budget restrictions.

Moreover, following previous research by Aronsson (2000) on the determinants of public expenditure in Swedish municipalities, we also include demographic data on population density and adjust for inflation in all fiscal measures, using Statistics Sweden CPI data with base year 2000. In contrast to Aronsson, we do not use regional dummies (north, south, east, west). Whilst this is a commonly used control, especially in US research<sup>21</sup>, we do not believe that this is appropriate for the Swedish municipal context. First, Sweden is a relatively homogenous country with comparatively small regional cultural differences,

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This is argued in Regeringens proposition 2007/08:27 Avskaffad statlig fastighetsskatt, m.m.

<sup>21</sup> Caplan (Caplan B 2001)

compared to both Spain and USA.<sup>22</sup> Furthermore, economic development has been actively managed since the late 19<sup>th</sup> century to be evenly spread across the country, thus creating similar standards of living and a smoothing out of income differences throughout the country (Schön 2000). Thus we argue that the classic rational for using regional controls is weak.

Furthermore, we include control variables for *structural cost*, which is a underlying measure of state transfers. The structural cost is the cost the municipality would have if it operated its activities on an average fee, ambition and level of efficiency and given to its own structural factors. We assume this to be a general good proxy for the level of non-discretionary spending.

Similarly we include the *equity ratio* of the municipality, testing for high local public debt. Last we further include *percent on welfare* as control. Note that we here use the terms determinant and controls interchangeably as the types are overlapping and since both are included in the  $X_{i,t}$ .

#### 4.3 Measuring Political Competition

Whilst the notion of political competition is readily imagined in theory, finding a suitable operational definition is another matter altogether. In our theoretical modeling we showed that the level of political competition can be seen as  $f(-\bar{e})$ , the density at the median preference for party *R* over party *L*. As general decision criteria for this measure, it must be reliable and valid (Bryman 2008). Reliability here means that the measure must be display few unsystematic errors. Validity means that the measure should have as few systematic errors as possible. Also, the measure must be valid conceptually as to be congruent with theory and externally valid so that results can be compared to those of previous research (Bryman 2008).

Holbrook & van Dunk (1993) evaluated the three most commonly used measures of political competition. Their survey shows examples of two types of operational measures of political competition: simple and composite (index) measures, while focusing on the latter (Holbrook, Van Dunk 1993). However, they found no clear agreement on how best to measure the degree of political completion, only that more complicated measures (e.g. index measures) are not necessarily superior (Holbrook, Van Dunk 1993).

Let us exemplify this to further clarify. Consider one of the most commonly used composite measures of political competition in the American context, the Ranney index. The Ranney index takes into account the proportion of democratic seats in both the state House

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<sup>22</sup> Compare to (Solé-Ollé 2006, Caplan B 2001)

and the state Senate elections, the percentage of democratic votes in the gubernatorial election as he the percentage of a defined period the Democratic Party have held the governor office and the control of the state legislative ((Holbrook, Van Dunk 1993)). As Holbrooke & van Dunk point out, however, even at face validity level, there are problems with using this measure. Foremost, the Ranney index, while used as a measure of electoral competition, is for the most part not based on electoral results (Holbrook, Van Dunk 1993). Even though other composite measures, such as the district-level competition measure, use electoral results to a larger extent it too is specifically based on a US institutional and legislative context. Thus, it does not readily translate to the Swedish municipal context. Therefore, not only are index measures possibly farther away from our theoretical modeling of competition, they are also more sensitive to the context they are developed within, and thus suffer from lower external validity.

Others, however, argue for simple approach.<sup>23</sup> A frequently used simple measure of political competition is difference in votes or electoral margin, often measured as percentage difference of the votes or the seats won, between the majority and the minority in the latest election. However, as Boyne (1996) points out, the electoral marginal do not need to correlate with the probability of change of party control. Solé Ollé(Solé-Ollé 2006) therefore incorporates the standard deviation of the incumbents vote share, taking up a middle ground in terms of measure complexity between the American composite indices. A high volatility can be seen as an indication of a high level of political competition. However, Solé-Ollé () cannot show that this measure is more efficient than the simpler differences measure.

Here, we may raise the question of how well e.g. the margin measure corresponds to the quite technical notion of  $f(-\bar{\epsilon})$ , the density of voters in equilibrium who are lost by diverging with spending from the equilibrium level. Whilst the margin ought, *prima facie*, to be proportional to  $f(-\bar{\epsilon})$ , we cannot ascertain the relationship of these measures other than trying to use it to yield results which in turn confirm theory. At the same time, using only differences in vote share or mandate does seem crude and is not necessarily neither the most valid or reliable measure of political competition.

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<sup>23</sup> See Besley and Case (Besley, Case 2002), Caplan (Caplan B 2001) Rogers and Rogers (Rogers, Rogers 2000)and Solé-Ollé (Solé-Ollé 2006)

#### 4.3.1 Four measures of political competition

Consequently, for reasons of comparability, we adhere to convention by employing margin measures. However, recognizing that a more complex measure may yield higher validity, we argue that the ratio measure as developed by Sole-Olle (2006) should also be employed. Moreover, we recognize that conventional measures are too static and insufficient in capturing the change in and dynamics of continuous competition. Indeed, it seems overly simplistic to, using only actual electoral outcomes to compute margins, implicitly assume that politicians do not gauge (and respond to) shifts in the electorate's preferences between elections.<sup>24</sup>

Whilst our theoretical modeling does not explicitly model the electoral cycle, we believe that a simple addition which would increase its applicability is to use yearly measurements of  $\omega$ . Therefore, we will compute a predicted result, by using information from polls on regional preferences of national level politics. This method of measurement will also give us more data variation on the variable of interest, political competition, thus addressing an important econometric shortcoming of measures using actual data.

For simplicity, measures using actual results will henceforth be called type A measures, whereas measures using predicted results will henceforth be called type P measures. Let us begin by defining the margin and ratio measures.

The intuition behind using the electoral margin is that the political competition is less fierce if the distance to the opposition increases. However, as Boyne (1996) notes, the volatility of the vote shares may also be important. A higher volatility presumably makes an incumbent less safe in winning the next election, minding that votes may more readily swing to the other party. Both of these faces of completion are captured in the ratio measure. We therefore get:

Margin measure:  $\omega_{i,j} = \text{majvoteprct}_{i,t} - 50$

Ratio measure:  $\omega_{i,j} = \frac{\text{majvoteprct}_{i,t} - 50}{\sigma_{\text{majvoteprct}_i}}$

These measures can be varied based on using either actual election results or predicted election results. In the case of type A measures, the *votepercent* component remains constant over the term in office, that is until next election. In the case of type P measures, the *votepercent* is recalculated for every year based on calculations of predicted electoral outcomes. In the few cases of negative predicted margins the absolute value is used. Note that

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<sup>24</sup> Or else that using only actual outcomes provides a valid measure.

the standard deviation in the ratio measure is constant over time for each panel based on both, relative to  $t$ , future and past measures of majority *votepercent*.

Shifts in voter preferences during a term are measured regularly by pollsters. Unfortunately no such polls for local level governments in Sweden are publicly available that match our dataset over time. Therefore, we need to estimate these changes. Boyne(1996) argues that shifts in voter preference at the local level are mainly driven by changes in the national political landscape. This assumption is also reasonable in the Swedish context with regards to party structures and voter behavior.<sup>25</sup> Thus, we assume the correlation between shifts in vote shares for different parties in local level elections is closely correlated to shifts in vote shares in general election, with a causality from the national level to the local level. We therefore argue that we can model shifts in sympathies for parties at local level by using changes on the national level.

This is accomplished through the following steps. First, we calculate for both party  $R$  and  $L$  the average correlation between changes from the last actual election party sympathy in local and national election in the four elections (1994, 1998, 2002 and 2006). Next, for every year without election, we average the changes for party  $R$  and  $L$  in the semi-annual polls (PSU) conducted by Statistics Sweden to the results of latest general election. Finally, we calculate *votepect<sub>i,t</sub>* here shown for party  $R$  as:

$$votepect_{R,i,t} = localvotepect_{previous\ election_{R,i}} + (corr_{\Delta R votepect\ mun\ election, \Delta R votepect\ nat\ election} \cdot \Delta national\ voter\ sympathy_{R,k,t})$$

Where,

$i$ = municipality

$t$ = year

$k$ = region

$R$  = party  $R$

If elections are held the same year the election results are used. Note that the changes in the PSU can be decomposed, presumably without significant loss of quality, to regional level.<sup>26</sup>

Thus, each municipality is allocated to its corresponding region and assigned the change in national voter sympathies found for that region. To some extent this accounts for the possibility of intraregional differences, for example between cities and countryside. However, do note that the three largest cities in Sweden, Stockholm, Gothenburg and Malmö are

<sup>25</sup> For example, the Swedish party structure is such that local parties are subordinated to the national party structure. Also, Swedish voters are “well behaved” with regard to voting. Holmberg (1993) shows that only two in ten Swedish voters vote differently in municipal and national elections. Furthermore, Holmberg finds that local issues matter little for voter’s decisions in municipal elections.

<sup>26</sup> As defined by Statistics Sweden. See appendix 3.

separate regions. Also note that the PSU only reports results for individual parties, from which block results are calculated. Moreover, we are not accounting for the different significance levels of reported changes from the PSU.<sup>27</sup>

## 5 Data

Next, we outline the key features of our dataset, in addition to the considerations involved in selecting sources. First, however, we wish to provide a short overview of Swedish municipalities.

### 5.1 Swedish municipalities during the sample period

Sweden is organized in three administrative levels: the national, regional and local level. At the local level, 290 municipalities exist with a median population of 15300. The municipalities' main responsibilities are vocational, primary and secondary education, elderly care, some social welfare and maintaining along with developing local infrastructure.<sup>28</sup> Local public spending as percentage of GDP for the year 1998 was eighteen percent (Moberg 2004). Local, as well as general elections, are held at the same day every fourth year.<sup>29</sup> Voter participation in both national and local elections hovers around eighty percent and seats are distributed proportionally to the percentage of the votes.

The political party system in Sweden is comparatively stable; since the election 1994, the same seven parties have been represented in the Swedish Riksdag. With a few exceptions all seven parties also participate in the local elections and usually dominate the local political landscape.

A clear remark should here be added about institutional reforms after the Swedish economic crisis in the 1990's. As a result of the large municipal deficits that followed the crisis, the Municipal Act on good financial management was implemented in the year 2000. The act contains a prohibition for individual municipalities to adopt an unbalanced budget and a requirement to offset negative results. Indeed, we unable to identify and isolate a direct effect on spending from this reform. Overall however, minor changes in the regulatory framework during the sample period should be captured by using year specific effects.

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<sup>27</sup> For e detailed description of the PSU see(SCB 2008)

<sup>28</sup> See appendix D

<sup>29</sup>Relevant to our sample, elections were held in 1994, 1998, 2002 and 2006.

## 5.2 Data collection

Using publicly available sources hosted by Statistics Sweden, the Council for Local Government Analysis and the Election Authority, we have built a dataset covering economic, socioeconomic, demographic and political variables for all Swedish municipalities.

Kommundatabasen, hosted by the Council for Local Government Analysis, has been used to collect data on economic variables and budgetary outcomes for the municipalities. Demographic variables have been collected at both the Council for Local Government Analysis and Statistics Sweden. Finally, outcomes of political elections are from the Election Authority and party preferences polls are all calculated by data from Statistics Sweden.

Overall, we assess these sources to be of high quality, reliability and relevance. First and foremost, all sources have official status and are professionally collected and maintained. Second, by Swedish law, municipalities are obliged to make public their finances and comply with census data investigation. Last, our chosen sources are extensively used in previous research on the Swedish context, which both speaks for its reliability and relevance but also furthers our overall contribution to the field by increasing the comparability of results.

## 5.3 Sample period and number of observations

Our panel data set covers the years from 1995 to 2008. We choose this period for the availability of data. All Swedish 290 municipalities appear in the sample of which 288 appear for all years.<sup>30</sup> In total, this gives us approximately 4300 individual observations. Data on the dependent variable is missing for the first in the sample (due to the lagged spending) and we further drop approx. 900 observations for unclear political majorities. In total around 2900 observations are used in our regression.<sup>31</sup>

## 5.4 Dependent variable

When considering municipal expenditure, it must be remembered that not all municipal spending is discretionary. Thus, it would be incorrect to include, or not control for, the non discretionary spending. Since we have not been able to obtain a specific measurement of discretionary municipal spending, we chose the overall approach of our regression specification to be in the form of total spending per capita. Instead we use total spending combined with extensive controls to isolate the discretionary spending.

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<sup>30</sup> The municipalities Knivsta and Nykvarn were formed during the period of investigation. Nykvarn was founded in 1999, Knivsta in 2003

<sup>31</sup> In comparison Solé-Olle (2006) uses 3550 individual observations, Baber & Sen (1986) 458 and Besley Case (2002) 1583 observations.

Still, in contrast to previous research we use a refined measure of public spending, namely the municipalities gross expenses in the mainly tax financed sector less internal revenues and sales to other local authorities, per capita (*cost of activities*). This means that municipality owned companies or business conducted within the municipal administration are subtracted. It is reasonable to believe that this measure of spending more accurately is linked to the voter demand variables. Further the data is adjusted for inflation and reported in real 2000 SEK term per capita. These findings are summarized below:

| Variable           | Obs N | Mean     | Std. Dev |
|--------------------|-------|----------|----------|
| Cost of activities | 4030  | 41983.07 | 8639.393 |

**Table 1 Descriptives - dependent variable**

### 5.5 Voter demand variables

As above, all fiscal variables are adjusted for inflation (base year 2000) and measured per capita.<sup>32</sup>

| Variable                       | Obs N | Mean     | Std. Dev |
|--------------------------------|-------|----------|----------|
| Equityratio                    | 3764  | 53.7941  | 19.53984 |
| Governmental grants per capita | 3764  | 510.296  | 2254.025 |
| Net finances per capita        | 4053  | -51.6259 | 641.8298 |
| Percent on welfare             | 4034  | 5.012961 | 2.250326 |
| Pop density                    | 4053  | 125.3451 | 418.4158 |
| Percent age 0-15               | 4050  | 11.64076 | 1.227202 |
| Percent age 65+                | 4050  | 19.13075 | 3.744323 |
| Population                     | 4053  | 30980.86 | 58538.45 |
| Structural cost                | 3760  | 23803.54 | 3636.304 |
| Taxbase                        | 4048  | 109613   | 19911.55 |

**Table 2 Descriptives - Voter demand variables**

### 5.6 Political variables

As outlined above we use thirteen political variables – twelve indicators of political competition and a single left majority dummy for our mixed setup. In applying this formal concept to Swedish data one important problem arises that is that – to our knowledge no accurate records on historical working majorities in Swedish municipalities exist.

The Swedish Association of Local Authorities and Regions only have information of such majorities for the year 2006 and 2008. Hence may only make a rough estimate of the correctness. For every term we therefore assume that a party is in power if their vote share in the last election where > 50 percent. If neither of the party block received above 50 percent

<sup>32</sup> A full list of formal variable definitions and data source can be found in Appendix B.

of the votes we conclude that a formal or informal majority either must be a inter block coalition or partly include a local party. We are unable to categorize such a party to either the left or the right block and are unable to use such a observation.

We follow earlier research and define L as composed of the Left party, The Social Democratic Party and the Green Party while R are defined as the Moderate Party, The Liberal Peoples Party, The Christian Democratic party and the Centre Party (2007).

**Table 3 Descriptives - political variables**

| <i>Variable</i>          | <i>N</i> | <i>Mean</i> | <i>Std. Dev</i> |
|--------------------------|----------|-------------|-----------------|
| Actual margin            | 3123     | 22.17328    | 14.24602        |
| Predicted margin         | 3123     | 22.21977    | 14.22576        |
| Actual ratio             | 3185     | 2.770127    | 3.987891        |
| Predicted ratio          | 3185     | 2.991166    | 3.426273        |
| Margin - left            | 1961     | 23.76017    | 13.77237        |
| Predicted margin - left  | 1961     | 24.4739     | 13.84613        |
| Actual ratio - left      | 1961     | 2.787076    | 4.219363        |
| Predicted ratio - left   | 1961     | 3.182914    | 3.752851        |
| Margin- right            | 1224     | 18.39999    | 13.42284        |
| Predicted margin - right | 1224     | 17.31151    | 13.48469        |
| Actual ratio - right     | 1224     | 2.742974    | 3.58755         |
| Predicted ratio - right  | 1224     | 2.68396     | 2.799668        |

Note: Partisan measures are summarized under the constraint that left and right respectively are in majority.

Table 4 Main results

| Variables                      | Leviathan |               |                  |                | Partisan       |               |                  |                | Mixed             |               |                  |                |                |           |          |           |          |           |          |           |          |           |          |           |
|--------------------------------|-----------|---------------|------------------|----------------|----------------|---------------|------------------|----------------|-------------------|---------------|------------------|----------------|----------------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|
|                                | Measure   | Actual margin | Predicted margin | Ratio - actual | Ratio - margin | Actual margin | Predicted margin | Ratio - actual | Ratio - predicted | Actual margin | Predicted margin | Ratio - actual | Ratio - margin |           |          |           |          |           |          |           |          |           |          |           |
| Political variables            |           |               |                  |                |                |               |                  |                |                   |               |                  |                |                |           |          |           |          |           |          |           |          |           |          |           |
| Left & right/Left/Left & right | 9.069     | (1.81)*       | 10.374           | (2.09)**       | 70.782         | (1.70)*       | 61.555           | (1.89)**       | -1.630            | 12.303        | 12.303           | (1.70)*        | 148.575        | (2.21)**  | 80.022   | -1.590    | 8.954    | (1.91)*   | 10.942   | (2.14)**  | 83.067   | (2.12)**  | 62.629   | (1.89)*   |
| (-) / right/ Left dummy        | -         | -             | -                | -              | -              | -             | -                | -              | -0.560            | 7.210         | 7.210            | 0.000          | 6.681          | -0.120    | 38.386   | -0.790    | -294.532 | -0.750    | -317.969 | -0.800    | -285.408 | -0.720    | -303.448 | -0.770    |
| Voer demand variables          |           |               |                  |                |                |               |                  |                |                   |               |                  |                |                |           |          |           |          |           |          |           |          |           |          |           |
| Equity ratio                   | -0.809    | -0.200        | -0.847           | -0.190         | -1.989         | -0.44         | -0.742           | -0.170         | -0.847            | -0.190        | -0.878           | -0.200         | -0.917         | -0.210    | -0.812   | -0.190    | -0.864   | -0.200    | -0.948   | -0.220    | -0.894   | -0.210    | -0.815   | -0.190    |
| Governmental grants per capita | -0.051    | -0.330        | -0.041           | -0.300         | -0.041         | -0.27         | -0.036           | -0.260         | -0.051            | -0.360        | -0.042           | -0.300         | -0.048         | -0.340    | -0.039   | -0.280    | -0.055   | -0.390    | -0.045   | -0.320    | -0.049   | -0.350    | -0.040   | -0.290    |
| Net finances per capita        | -0.045    | -0.740        | -0.044           | -0.890         | -0.035         | -0.65         | -0.043           | -0.850         | -0.045            | -0.890        | -0.044           | -0.880         | -0.046         | -0.910    | -0.041   | -0.830    | -0.046   | -0.910    | -0.045   | -0.900    | -0.046   | -0.910    | -0.043   | -0.870    |
| Percent on welfare             | 28.733    | -0.830        | 29.131           | -0.750         | 48.012         | -1.17         | 29.504           | 0.750          | 28.863            | -0.740        | 29.223           | -0.750         | 29.592         | -0.750    | 29.807   | -0.760    | 29.934   | -0.770    | 30.145   | -0.780    | 28.960   | -0.740    | 30.620   | -0.790    |
| Pop density                    | -6.010    | (2.93)**      | -5.904           | (3.05)**       | -6.879         | (3.99)**      | -5.811           | (3.8)**        | -5.863            | (3.48)**      | -5.806           | (3.53)**       | -5.889         | (3.72)**  | -5.787   | (3.76)**  | -6.305   | (3.50)**  | -6.230   | (3.48)**  | -6.367   | (3.33)**  | -6.117   | (3.44)**  |
| Percent age 0-15               | 195.156   | (2.23)**      | 193.589          | (1.76)*        | 169.496        | -1.47         | 198.376          | (1.78)*        | 196.034           | (1.78)*       | 194.470          | (1.77)*        | 196.488        | (1.78)*   | 198.026  | (1.78)*   | 203.731  | (1.77)*   | 203.199  | (1.76)*   | 206.734  | (1.79)*   | 207.462  | (1.78)*   |
| Percent age 65+                | -85.743   | -1.640        | -84.508          | -1.450         | -100.553       | (1.65)*       | -81.738          | -1.400         | -85.536           | -1.460        | -84.348          | -1.440         | -91.623        | -1.570    | -83.597  | -1.440    | -86.057  | -1.470    | -84.959  | -1.450    | -88.647  | -1.510    | -82.027  | -1.400    |
| Population                     | -0.031    | (1.95)*       | -0.031           | (2.54)**       | -0.031         | (2.41)**      | -0.030           | (2.41)**       | -0.032            | (2.56)**      | -0.032           | (2.56)**       | -0.032         | (2.57)**  | -0.030   | (2.45)**  | -0.032   | (2.57)**  | -0.032   | (2.59)**  | -0.031   | (2.51)**  | -0.030   | (2.46)**  |
| Structural cost                | 0.119     | -0.850        | 0.113            | -0.890         | 0.068          | -0.5          | 0.111            | 0.880          | 0.122             | -0.960        | 0.115            | -0.900         | 0.125          | -0.980    | 0.114    | -0.890    | 0.121    | -0.960    | 0.114    | -0.900    | 0.117    | -0.930    | 0.113    | -0.890    |
| Tax base                       | 0.004     | -0.320        | 0.004            | -0.360         | -0.016         | -1.26         | 0.005            | 0.410          | 0.004             | -0.290        | 0.004            | -0.360         | 0.002          | -0.190    | 0.005    | -0.380    | 0.004    | -0.320    | 0.005    | -0.370    | 0.003    | -0.250    | 0.005    | -0.430    |
| Other                          |           |               |                  |                |                |               |                  |                |                   |               |                  |                |                |           |          |           |          |           |          |           |          |           |          |           |
| Spending t-1                   | 0.541     | (30.98)**     | 0.540            | (18.21)**      | 0.597          | (20.71)**     | 0.484            | (6.30)**       | 0.541             | (18.21)**     | 0.540            | (18.19)**      | 0.540          | (18.23)** | 0.541    | (18.25)** | 0.541    | (18.14)** | 0.540    | (18.13)** | 0.540    | (18.13)** | 0.541    | (18.16)** |
| Political variables            |           |               |                  |                |                |               |                  |                |                   |               |                  |                |                |           |          |           |          |           |          |           |          |           |          |           |
| Left & right/Left/Left & right | 19.758    | *             | 22.552           | **             | 175.638        | **            | 119.293          | *              | 25.488            | -             | 26.746           | *              | 322.989        | **        | 174.340  | -         | 19.508   | *         | 23.787   | **        | 180.580  | **        | 136.447  | *         |
| (-) / right/ Left dummy        | -         | -             | -                | -              | -              | -             | -                | -              | 9.396             | -             | 13.352           | -              | 12.372         | -         | 70.954   | -         | -544.421 | -         | -588.831 | -         | -528.533 | -         | -560.902 | -         |
| Voer demand variables          |           |               |                  |                |                |               |                  |                |                   |               |                  |                |                |           |          |           |          |           |          |           |          |           |          |           |
| Equity ratio                   | -1.763    | -             | -1.841           | -              | -4.935         | -             | -1.438           | -              | -1.845            | -             | -1.909           | -              | -1.993         | -         | -1.769   | -         | -1.882   | -         | -2.061   | -         | -1.943   | -         | -1.776   | -         |
| Governmental grants per capita | -0.111    | -             | -0.089           | -              | -0.102         | -             | -0.071           | -              | -0.111            | -             | -0.091           | -              | -0.104         | -         | -0.085   | -         | -0.120   | -         | -0.098   | -         | -0.107   | -         | -0.087   | -         |
| Net finances per capita        | -0.098    | -             | -0.096           | -              | -0.087         | -             | -0.083           | -              | -0.098            | -             | -0.096           | -              | -0.100         | -         | -0.089   | -         | -0.100   | -         | -0.098   | -         | -0.100   | -         | -0.094   | -         |
| Percent on welfare             | 62.599    | -             | 63.328           | -              | 119.136        | -             | 57.179           | -              | 62.882            | -             | 63.528           | -              | 64.330         | -         | 64.939   | -         | 65.216   | -         | 65.533   | -         | 62.957   | -         | 66.710   | -         |
| Pop density                    | -13.094   | ***           | -12.835          | ***            | -17.069        | ***           | -11.262          | ***            | -12.773           | ***           | -12.622          | ***            | -12.802        | ***       | -12.608  | ***       | -13.736  | ***       | -13.543  | ***       | -13.491  | ***       | -13.327  | ***       |
| Percent age 0-15               | 425.176   | **            | 420.846          | **             | 420.586        | *             | 384.450          | *              | 427.089           | *             | 427.761          | *              | 427.148        | *         | 431.429  | *         | 443.858  | *         | 441.737  | *         | 449.422  | *         | 451.987  | *         |
| Percent age 65+                | -186.804  | -             | -183.713         | -              | -249.511       | -             | -158.406         | -              | -186.533          | -             | -183.365         | -              | -199.180       | -         | -182.129 | -         | -187.488 | -         | -184.476 | -         | -192.711 | -         | -178.708 | -         |
| Population                     | -0.068    | *             | -0.067           | **             | -0.077         | **            | -0.058           | **             | -0.070            | **            | -0.070           | **             | -0.070         | **        | -0.065   | **        | -0.070   | **        | -0.070   | **        | -0.067   | **        | -0.065   | **        |
| Structural cost                | 0.259     | -             | 0.246            | -              | 0.169          | -             | 0.216            | -              | 0.266             | -             | 0.250            | -              | 0.272          | -         | 0.248    | -         | 0.264    | -         | 0.248    | -         | 0.254    | -         | 0.246    | -         |
| Tax base                       | 0.009     | -             | 0.009            | -              | -0.040         | -             | 0.009            | -              | 0.009             | -             | 0.009            | -              | 0.004          | -         | 0.011    | -         | 0.009    | -         | 0.011    | -         | 0.007    | -         | 0.011    | -         |

Notes: Observations are 2918, number of municipalities is 200 and R-Squared is 0.902 in all specifications. Significance at the 0.1, 0.05 and 0.01 levels are marked by \*, \*\* and \*\*\* respectively. All specifications include municipality fixed effects.

## 6. Results

Having developed our main regressions and measures of political competition, we may now analyze the results. First, we will address the econometric issues encountered in estimating the specified models. Second, we will analyze the results by investigating the size and significance of coefficients of the political competition measures. This is the main focus of investigation. Third, we will briefly comment on the size and significance of the estimated determinants. Fourth, the robustness of the findings is discussed. Last, we summarize our analysis in relation to our specified testable hypotheses.

### 6.1 Econometric issues

#### 6.1.1 Error terms

As outlined previously, we have reason to suspect that the standard assumptions of homoskedasticity and i.i.d. of the error term does not hold for our data. Indeed, calculating a Modified Wald statistic<sup>33</sup> for groupwise heteroskedasticity (Baum 2001), and obtaining ( $p=0.00$ ) leads us to reject the assumption of homoskedasticity and employ robust standard errors using Huber-White sandwich estimators of variance.

#### 6.1.2 Fixed effects

Next, one major econometric issue is the applicability and impact of fixed effects estimation. As noted, we have reason to believe that fixed effects are present. Therefore, we have performed both the Hausman and Breusch-Pagan tests for all specifications. Both tests indicate that fixed effects are preferable ( $p = 0.00$  for both tests). In addition, using an F test on the joint exclusion of time effects indicates that time effects are significant to our model ( $p=0.00$ ). Thus, data indicates that both municipality fixed effects and year fixed effects should be included. These findings are consistent with previous research (Solé-Ollé 2006, Besley, Case 2002).

However, we share Solé-Ollé's concerns in using municipality fixed effects, especially for type A measures (Solé-Ollé 2006). Such measures have little variation in data, especially

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<sup>33</sup> "The test calculates a modified Wald statistic for groupwise heteroskedasticity in the residuals of a fixed-effect regression model,[...].The null hypothesis specifies that  $\sigma_i^2 = \sigma^2$  for  $i = 1, \dots, N_g$ , where  $N_g$  is the number of cross-sectional units." (Baum 2001)

when few actual elections are used. In our data, we use the election results from four elections as well as compute a new measure of political competition that varies for each year. Nevertheless, employing fixed effects incurs a heavy penalty on the degrees of freedom in addition to a penalty on the explanatory power of other controls. This may account for the lower significance of our main competition measure in all specifications with all measures, compared to Solé-Ollé. We find that our main results are robust to employing year and municipal fixed effects for both type A measures and type P measures. The same problem is evident in our ratio measures of political competition, both type P and type A, where the standard deviation of the each party-block vote-share is constant over time. Most likely, this is due to the lack of variation in data on the measure of electoral competition. We have therefore chosen to present our main results with using both municipality and year effects.

### ***6.1.3 Extended controls***

A number of additional voter demand variables have been used to test the robustness of our result. First, our results are both robust and actually benefit, albeit marginally, in terms of significance from including real GDP as an additional proxy for voter demand. Results are also robust to including further lags of municipal spending and/or national GDP, which are found to be insignificant when year effects are included. Indeed, the most significant impact on results comes not from adding more municipal variables but from adding time variables alone.

### ***6.1.3 Functional form misspecification***

We have set up alternative specifications where our explanatory variables – both political and voter demand variables – have been added to both logarithmic and quadratic form. In general, apart from the squares of structural costs and government grants, other functional forms are insignificant at 10% level when tested for joint exclusion F-tested. If included on t-test performance ( $p=0.00$ ) the squares of structural cost, government grant, act as suppressors and improve the significance of our political variables slightly when added. However, since we have no theoretical foundation for such specifications, and since our results are robust and on the conservative side, we conclude that the original specifications of functional form are, by and large, correctly specified.

### ***6.1.4 Assessing the impact of measurement error in political variables***

As noted, our measurements of political competition contain some systematic measurement errors in the sense that the predicted electoral outcome may be different from the actual due to

the non-rigidity of political blocks in practice. To assess the impact of this measurement error we have compared our classifications of electoral majority with actual electoral majorities based on Swedish Association of Local Authorities and Regions internal data from 2006. The inability to successfully predict outcomes would have important implications for our partisan set up where the political blocks are assumed to pursue different politics when in office. If we cannot correctly assess who is in office we cannot correctly explain the variation in spending.

A comparison shows that in the majority of cases, our classifications are correct. However, this raises the important question of whether such mispredictions affects our overall results. Note that we cannot assess the impact of measurement errors fully, first and foremost because we only have actual municipal outcomes data from 2006. Nevertheless, wrongful predictions are most often due to the presence of a non-aligned, unique, local political party. This would cause none of the aligned political blocks to gain a majority of the votes, whereby the non-aligned party is included in a coalition government. Still, we assess such mispredictions to be of minor impact to our partisan setup because in most cases, this simply means that the leading political block extends by this additional party. Such local parties are often single-issue-parties and thus we assume, quite reasonably, that they have no dominant ideological preferences and thus no major impact on the partisan flavor of the government.<sup>34</sup>

Next, the presence of inter block coalitions makes our measures not correspond to actual outcomes. Judging by our 2006 sample, it is our inability to take account of the relatively common practice of coalition governments of the Social Democratic Party and the Center Party. In the 2006 sample this coalition were found in eleven different municipalities. Five of these were predicted as left majorities, five were predicted as right majorities and one observations were excluded from our regression due to than neither of the blocks had a own majority. A simple analysis would therefore suggest that - assuming partisan objectives and that this coalition actually carry out a centrist policy – that in our partisan set up, we slightly underestimate the effect of partisan political competition on spending. However, the bias resulting from these measurements error is assessed to be small.

### **6.1.5 Outliers**

The next step in analyzing our data is to check for outliers. In doing so, we have used the methods suggested by Hadi (1992, 1994) to test for multivariate outliers among our voter

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<sup>34</sup> See (Wörlund 1999)

demand variables.<sup>35</sup> At a 5% cut off point, a total of 403 observations are flagged. Of these observations, 288 are among those used in our main regressions. To test if our results at large are affected by these we have run our main regressions dropping these variables. Compared with previous results these are practically the same. Thus, we assess that even though there may be outliers present in our dataset, our main results are robust to their inclusion and exclusion.

## **6.2 Political variables**

Given the aforementioned econometric issues, the main results are based on our findings from our most comprehensive fixed effects setup using both year and municipality fixed effects with robust standard errors.

### **6.2.1 *Leviathan specification***

In our leviathan specification, all tested measures of political competition are significant. For the type A margin, a one-percentage point increase in the margin would increase spending by on average 19.8 SEK per capita per year in spending, significant on the 10% level. For our type P margin, we find that the same margin increase would increase spending by 22.6 SEK per capita per year. This result is significant on the 5% level.

Similarly, our type A ratio measure shows that a one percent increase in margin – assuming the average standard deviation of 4.79 - would increase spending by 12,83 SEK per capita per year. For our type P ratio measure, the same increase in margin, using the average standard deviation of 3.82, is 16.1 SEK per capita per year. These are both significant at the at 5% level.

The results point to the strength of the leviathan model. However unrealistic the assumption of unpartisan politicians may seem, data clearly finds support for the leviathan hypothesis. This leads us to believe a “competition effect” is at work that decreases spending if political competition increases.

Yet, since the leviathan specification does not control for party effects, we cannot confirm the leviathan assumption of unpartisan politicians unless we specify our model in such a way that party ideology may differ. Since such parameters are only included in the

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<sup>35</sup> We assess that the political variables are not suitable for inclusion in the outlier test since they are, in the case of type A measures, not varying sufficiently over time (being constant between elections). For our type P measures, they are to be considered “artificial” and it would be unwise to exclude cases based upon the measure which you would like to test its applicability to data.

partisan and mixed setups, we arrive at the conclusion that we cannot reject nor confirm the leviathan hypothesis until we review the findings from the partisan model.

### **6.2.2 Partisan specification**

The results of our partisan model are inconclusive. Neither  $\gamma_0$  nor  $\gamma_1$  of type A margin and type P ratio measure are significant at the 10 % level (although  $\gamma_0$  for type a has  $p=0.103$ ). In the case of the type P margin and the type A ratio,  $\gamma_1$  is insignificant for both parties as well. Thus we cannot reject the null that  $\gamma_1=0$ .

For party L,  $\gamma_0$  is significant using type P measure at the 10 % level with an estimate of 26.74 SEK per capita per year. For our type A ratio, the estimated impact of a one percent increase in margin is 72.370 SEK per capita per year given the mean party L voteshare standard deviation of 4.463 percentage points.

Whilst these findings are weaker than our findings in the leviathan setup, considering that both margin measures are close to the 10% level, there is some merit to the partisan hypothesis in the case of party L. This indicates that for party L there is indeed an interaction effect between being in office and the margin of victory, although we cannot reject the null for  $\gamma_0$  with all measures. Still the direction of the coefficient is as expected in all cases.

For party R, however, we do not find support for the partisan hypothesis, expecting  $\gamma_1$  to be negative, symmetrically to  $\gamma_0$ . As we fail to reject the null for party R, we find weak support in favor of there not being an interaction effect between the margin and party R being in power. In relation to our theoretical framework, this can be interpreted as data providing support for partisan preferences being present in party L, but not providing support for partisan effects in party R.

### **6.2.3 Mixed specification**

In the mixed specification, we investigate the impact of non-binding commitments. It is predicted under the partisan model that this will lead to full platform divergence. We find that all competition measures are significant at the 10% level.

However, the dummy for left majority is not significant under any of the above measures. For the type A margin, the effect is estimated to 19.508 SEK per capita per year. The estimated coefficient for the P margin is slightly higher, 23.787 SEK per capita per year, and significant at the 5% level. The estimated impact for a one percent increase in electoral margin, given mean standard deviation of 4.463, is as before larger than the impact from our

margin measures. For type A ratio the impact is an increase of 40.763 SEK per capita per year. For the type P ratio the impact is 30.801 SEK per capita per year.

Overall, we find that the lacking significance for the left dummy points us to three findings. First, that we cannot reject that left governments do not spend more on average than right governments, once the degree of competition has been controlled for separately. Second, the results may indicate that electoral commitments are indeed binding. Third, the coefficient on the measure of competition is significant, statistically and economically, when controlling for the party governing. In light of the findings from the partisan specification, we assess that the type of party in office only impacts the level of spending when modelled interactively.

Conversely, this also means that a priori claims of party L spending more than party R cannot be supported. In light of the findings from both the partisan and leviathan specifications, the impact of the degree of political competition is significant in all cases.

### 6.3 Voter demand variables

Generally, few of the voter demand variables are significant if both year effects and fixed effects are applied. This is expected because of our maximalist specification of controls, including year and municipality fixed effects and robust calculation of standard errors. We find that *equity ratio*, *governmental grants per capita*, *net finances per capita*, *percent on welfare*, *percent age 65+* and *tax base* are insignificant for all measures of political competition in both the leviathan, partisan and mixed specification. Our estimated coefficient on all these variables are also economically insignificant (range of 0-2 SEK per capita per year) with the exception of *percent on welfare* (range 60,9-67,2 SEK per capita per year) and *percent 65+* (-158.406 to - 199.180). We had expected *percent age 65+* to be positive and significant as retired citizens require more support from the municipality. However, it may simply be so that newly retired Swedes (e.g. 65-70 years) are relatively healthy and that this measure is too crude to capture the cost increasing impact of having an older population when controlling for a smaller *tax base* to tax.

Still, three control variables are statically significant. First, the population density is significant at the 1% level in all twelve regressions with a range of 5.8-6.4 SEK per capita per year. Second, the *percent age 0-15* is significant at the 5 % level in our leviathan specification for both margin measures and at the 10 % in all other regression (the coefficient hovers at about 425 SEK per capita per year). Last, *population* (population size) is statistically significant at the 10% or 5% level in all regression around -0.5 SEK per capita per year. Thus,

an increase of a municipality's population of 1000 would decrease average spending per capita per year by circa 50 SEK, all other equal. This indicates the presence of economies of scale.

#### 6.4 Analysis of results

In general, we find that main results point to the strength of the leviathan hypothesis. Indeed we do not find support for  $H_{alt}$ , the alternative that decreased competition would decrease spending in the leviathan specification or the mixed specification.

Next, we only find limited support for the partisan hypothesis,  $H_{part}$  in the case of party L, and no support in the case of party R. Since the partisan hypothesis in the strictest sense requires the effects to be opposite, yet equal in magnitude and present for both parties, we can only say that party L displays partisan effects. However, we cannot rule out the possibility, as Caplan (2001) suggest that there are opposite effects at work for party R. We will elaborate on this interpretation in our discussion.

In the case of the mixed hypothesis,  $H_{mix}$ , we cannot reject the null that the coefficient on the left-dummy,  $\gamma_1$ , is equal to nil. Thus we find no support for platform divergence. On the other hand, we do find support for the impact of political competition even when party in power is controlled for. However, an important caveat applies to this statement. Indeed, we cannot verify that our predicted/assumed calculations of what block is *de facto* in power for each municipality. Although we have tried to estimate the degree of correspondence to reality, the lack of historical data on actual majorities make it difficult in a panel data setting to draw definitive conclusions on the matter. Still, assessing that our predictions are correct in the definitive majority of cases, as suggested by available data, we tentatively conclude that the mixed hypothesis is not supported by data at acceptable significance levels and that, moreover, the failure to reject the null for  $\gamma_1$  in the mixed setup actually provides some merit to the leviathan hypothesis.

On the note of ratio versus margin measures we find that across our set ups, they fare generally equally well. Indeed at no point is the margin measure less statistically significant than the ratio measure. Also, when adjusted for the sample mean standard error, we find that the coefficients are similar in size. Thus, we cannot conclude that the ratio measure is preferable to the margin measure. Given our expressed concerns regarding the validity of using this measure we would rather conclude that the margin measure is preferable unless only historical data is used and the measure retested.

Regarding our predicted measures, we are a little bit disappointed about their performance. Whilst overall, they fare slightly better than type A in the margin measure context, they do not outperform overall, and actually perform worse in the ratio case. Also, the size of the coefficients deviates curiously when using ratio measures. This may be caused by insufficient reliability, due to measurement errors multiplying when introducing the standard deviation component.<sup>36</sup> Thus a small deviation in the predicted margin may yield a large deviation in the predicted standard deviation.

Overall, we have found support in favor of the leviathan hypothesis, as well as indications of some partisan effects at work for party L. In all other cases, we cannot reject the null.

## 7. Discussion

We started this thesis with the question if the microeconomic view of competition had any relevance in the political context. Could it be that competition produces efficient outcomes in both the efficient market and, often described as its antithesis, politics?

We now feel confident to say that the answer to this question is: yes, but only to a limited extent. Let us elaborate on the robustness of these findings, their possible causes, and their external validity.

### 7.1 Robustness of findings

We argue that, overall, the most support is given to the leviathan hypothesis. The eight significant leviathan coefficients reported (including the mixed model), and the noted support from specification excluding municipal and year fixed effects, clearly points in this direction.

In our partisan setups, the effects are ambiguous when analysed. In the case of left parties, two out of four measures of competition are significant and all four exhibit positive coefficients in line with theory and as noted the signs and significance levels are robust to dropping both year and municipality fixed effects. We therefore conclude that left wing politicians tend to increase spending as a response to decreased competition. For right wing parties in our partisan setup, our failure to reject the null leaves us in doubt. No significant results are reported when both municipality and year effects are included and the signs are in conflict with theory.

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<sup>36</sup> Since  $\sigma = (E[X - \mu]^2)^{\frac{1}{2}}$

We argue that these contradictory results for right wing politicians should be approached from two different angles. First, they highlight the need to be open with the econometric challenges any estimation of this kind is facing. We believe that the specification we focus on is the most adequate, but there is still a need to acknowledge that econometric misspecifications might be present. Indeed, previous research generally use more advanced methods of estimation.<sup>37</sup> We cannot say to what extent this impacts our results, yet we believe that the fundamental insights are appropriately captured in our simpler estimation method.

## 7.2 Evaluating explanations

However, econometric issues are not sufficient to explaining these results. Clearly, they give some support for the view that Swedish right wing parties at least do not decrease spending with a significant amount, even when the lack of political competition presumably would give them the opportunity to do so. There may be several reasons to this. One plausible explanation is that of the comparatively leftish Swedish right.<sup>38</sup> It may be the case that Swedish right wing politicians have no sincere partisan wish to scale down the size of the public sector to the same extent as their Spanish counterparts seem to have according to Solé-Ollé (2006).

A second explanation, may lie hidden in the dynamics of the public discourse where it is often political infeasible to close down or downsize political projects while scaling them up rarely faces the same constraints. If this is a correct description of reality then right wing politicians will be unable to decrease spending as much as they are willing to.

Third, previous research suggests that coalitions tend to increase spending in comparison to single party governments (Solé-Ollé 2006). It may be the case that individual right wing politicians wish to expand spending on their own areas of responsibility outweigh their common goal decrease overall spending. A majority of Swedish municipalities are run as coalitions. Moreover, the right block in Swedish politics is more fragmented than the left, where the Social Democrats historically, both nationally and locally, have held a majority of seats alone. Thus, on average, right block majorities would be more likely to be run as coalitions, which may explain the results not being aligned with the partisan prediction.

Finally, and maybe the most germane explanation, is that right wing politicians trade off partisan utility against leviathan rents. This line of argument is proposed by Caplan (2001). In

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<sup>37</sup> For example, Solé-Ollé uses non-linear simultaneous estimation.

<sup>38</sup> For e.g. Elff (2008) who identify three different categories of economically right parties. From left to right the categories are "Agrarian, liberal & Christian/confessional", "Conservative" and "Right Wing". Of the parties defined as belonging to party R three Elff label three as in the first category, one in the second and none in the last and most economically right category.

this case, we assume instead that all parties have both leviathan and partisan properties. For party L the leviathan and partisan effects are in the same direction. For party R they are rather in the opposite direction. If these effects net out, this could explain our results in the partisan specification. However, clearly such effects are hard to measure and we are not aware of any such attempts, nor a clear theoretical underpinning of this, however intuitive, alternative mechanism.

A brief remark should also be added on the topic of convergence of political platforms. Whilst a naïve analysis would suggest that there has not been full convergence historically in Sweden, maybe, things are about to change. Since 2004 the four national right wing parties in Sweden have come together under a common electoral platform as “the Alliance”. Since the beginning of 2009 the same can be said for the three left wing parties who label them selves “the Red-Greens”. We argue that these developments may indicate a convergence in policies between the parties.<sup>39</sup> This year, 2010, is election year in Sweden, and for the first time in a generation, there are two fixed electoral blocks. Thus, our modelling may actually become an increasingly accurate depiction of the political competition in Sweden in the future.

### **7.3 A comparison with international findings**

Let us continue and put our findings in an international comparison. Generally this thesis adds to previous research investigating both a partisan and leviathan effects. Solé Ollé (2006) overall, argues in favour for the partisan hypothesis but the results also display leviathan effect. Caplan (2001) argues the other way around and generally support a leviathan view modified with limited partisan effects. As to the economic significance of our findings these are higher than in the here surveyed previous research. For example, Solé-Ollé (2006) finds that a one percent increase in the electoral margin increases spending with € 0.567 per capita and year. Although this estimate is not significant at the 10 % level, it can be compared to our estimates in the range of 12.8-19.8 SEK per capita. Caplan (2001) tests the leviathan hypothesis on US state spending. There, an increase in the electoral margin in the state senate increases spending with \$0.674 while an increases margin to the state house of representatives increases spending with \$0.971.

With the above mentioned in mind on still needs to acknowledge the moderate economic significance of our results. One may here remember the arguments of Boyne (1996)

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<sup>39</sup> See Dagens Nyheter 20100506

that municipal level politician competition may have less impact on spending than national level politics.

## **8. Conclusions**

### **8.1 The impact of political competition on discretionary spending**

In conclusion, our study finds support for the view that political competition does affect the level of spending in Swedish municipalities. As to how, we argue that both right and left wing politician have leviathan tendencies but may also be affected by partisan objectives, most evidently in the case of left governments. All four measures in our leviathan specification suggest that increased competition reduces spending. In a partisan specification one can not draw equally strong conclusions; the results are only significant for the left government. Two out of four measures give statistically significant support for the view that left governments increases spending if competition decreases, while no results at all are significant for the right party government. We conclude that whilst this may be caused by a number of factors, one interesting explanation put forth by Caplan (2001) is that a leviathan effect is magnified by a partisan effect for left wing government, while it is mitigated by partisan objectives for right wing government.

### **8.2 Methodological advances**

We suggest that, based on our results, our attempt to introduce a variable measure of political competition based on polls of party sympathy is moderately successful. Although we need to stress the limitations of the measure itself and the assessment of it, our result imply that its ability to incorporate shifts in voter sympathy on a yearly basis somewhat better captures the changes in political competition.

While the increased variation of the predicted measure does in some cases yield more significant results than measures based on actual margin, we may at least conclude that the predicted measure does not perform worse, rather slightly better, than previously established measures. At the same time, it is important to note the drawbacks in decreased reliability from the use of polls instead of actual stated voter sympathy through elections. Thus, although we believe that the approach behind our measure, to estimate yearly shifts, better captures the restless nature of political competition, we do not have sufficient control over measurement errors and information on the best way to calculate the estimates to say with certainty that this measure is preferable as-is. Thus, we are modest about the success of

our measure and simply conclude that while we still believe in the approach, the exact implementation needs improvements through further research.

### **8.3 Validity**

First, one needs to acknowledge the need for more advanced econometric methods to further test our results. For example, a non linear model may be estimated as outlined by Solé-Ollé (2006).

Second, it is import to note that a major source of error is that we work with predicted instead if actual measures of political majorities. Indeed, in a number of cases, our predications will differ from the actual majorities that are formed. However, due to lack of historical data on actual majorities, we have not been able to estimate the impact of this issue to its full extent.

Third, we assess that these results are to some extent are bound to a Swedish institutional setting. One may argue that the forces of competition are present in every political system, but the institutional framework will undeniably affect how these forces affect outcome. The notion that this field of research so far has been unable to converge to a somewhat common view, may it be a compromise between the leviathan and partisan hypothesis, can be interpreted in support for the view that different institutional and cultural settings indeed create different outcomes with regard to political competition.

Last, our results are also bound to the period of investigation. We can only speculate around future political developments but if the current trend with increasingly stronger political alliances on both the left and right side of Swedish politics the dynamics of party competition will definitely be affected.

### **8.4 Future research**

This thesis highlights a number of areas where advances are needed. To begin with, descriptive research is needed to develop a comprehensive database of political circumstances in Swedish municipalities. The lack of historical descriptive data on actual working majorities clearly limits studies in political science and political economics in a Swedish context.

Also, as others have noted, the lack of adequate models for competition between more then two parties are severe. Here theoretical advances are needed. In addition, we are surprised to note that, to our knowledge, no formal model has been developed that includes both leviathan and partisan effects. This thesis adds to previous empirical research indicating that a compromise between the leviathan and partisan hypotheses should be struck.

Moreover, we recognise the difficulties to empirically separate isolate leviathan and partisan effect if they are assumed to be simultaneously in play. We suggest that a feasible approach could be to make use of variances in the level of direct control of elected politicians over the final use of fund either between separate institutional settings or between separate fields of spending. A right wing politician facing opposite rents will increase funding in areas with a high degree of direct control and decrease spending in areas with low degrees of direct control.

Finally, we do believe that our approach to incorporate voter sympathy polls in measures of political competition have some merits. We introduce a more detailed measure, using rudimentary data and computational methods to predict margins, showing that this measure of margin, nevertheless fares slightly better than conventional measures; imagine what a professional statistician with better data and methods could do! Thus, even though the type P measure has not drastically altered our findings, we believe that it may be a viable way forward to obtain better measurements.

Thus, for future research, there is a need to investigate to what extent local governments recognize and adapt spending to changes in the level of political competition during their term. For example, it is possible the effect of an increase or a decrease in the level of competition differ with respect to the time to the next election.

## 9. Bibliography

- Adams, J. 1999, "Multiparty spatial competition with probabilistic voting", *Public Choice*, vol. 99, no. 3, pp. 259-274.
- Aronsson, e.a. 2000, "The impact of regional public expenditures on the local decision to spend", *Regional Science and Urban Economics*, vol. 30, pp. 185-202.
- Austen-Smith, D. 1987, "Interest Groups, Campaign Contributions, and Probabilistic Voting", *Public Choice*, vol. 54, no. 2, pp. 123-139.
- Baber, W.R. & Sen, P.K. 1986, "The Political Process and the Use of Debt Financing by State Governments", *Public Choice*, vol. 48, no. 3, pp. 201-215.
- Baltagi, B.H. 2008, *Econometric analysis of panel data*, 4th edn, Wiley, Chichester.
- Baum, C. 2001, *XTTEST3: Stata module to compute Modified Wald statistic for groupwise heteroskedasticity*.
- Besley, T. & Case, A. 2002, "Does Electoral Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits", *The economics of budget deficits. Volume 2, 2002*, pp.204-33, .
- Black, Duncan, 1948, "On the Rationale of Group Decision-making" *The Journal of Political Economy*, Vol. 56, No. 1 pp. 23-34 Bordon, M., Cerniglia, F. & Revelli, F. 2003, "In Search of Yardstick Competition: A Spatial Analysis of Italian Municipality Property Tax Setting", *Journal of Urban Economics*, September 2003, v.54, iss.2, pp.199-217, .
- Boyne, G.A. 1996, "Competition and Local Government: A Public Choice Perspective", *Urban Studies (Routledge)*, vol. 33, no. 4/5, pp. 703-722.
- Bronson & Allen 2004,  
*Downs' Model of Political Party Competition*, Manuscript edn.
- Bryman, A. 2008, *Social research methods*, 3rd edn, Oxford University Press, Oxford.
- Caplan B 2001, "Has Leviathan Been Bound? A Theory of Imperfectly Constrained Government with Evidence from the States", *Southern Economic Journal*, vol. 67, no. 4, pp. 825.
- Dagens nyheter 20100506, *Nu leker vi följa Fredrik*.
- Dawson, R. & Robinson, J. 1963, "Inter-Party Competition, Economic Variables, and Welfare Policies in the American States", *The Journal of Politics*, vol. 25, pp. 265-289.
- Dixit, A. & Londregan, J. 1998, "Ideology, Tactics, and Efficiency in Redistributive Politics", *Quarterly Journal of Economics*, May 1998, v.113, iss.2, pp.497-529, .

Downs, Anthony, 1957, "An Economic Theory of Political Action in a Democracy", *The Journal of Political Economy*, Vol. 65, No. 2, pp. 135-150

Elff Martin, 2008 "A Spatial Model of Electoral Platforms", Working paper,  
<http://polmeth.wustl.edu/media/Paper/Elff-SpatialModelPlatforms.pdf> Erlingsson, G.  
2006, *Vad vet vi om kommunal korruption?*, Ratio.

Giardina, e.a. 2009,  
*Federalism, Party Competition and  
Budget Outcome: Empirical Findings on  
Regional Health Expenditure in Italy*, Working paper edn.

Grimes, T.R. 1990, "Truth, Content, and the Hypothetico-Deductive Method", *Philosophy of Science*, vol. 57, no. 3, pp. 514-522.

Hadi, A.S. 1994, "A Modification of a Method for the Detection of Outliers in Multivariate Samples", *Journal of the Royal Statistical Society. Series B (Methodological)*, vol. 56, no. 2, pp. 393-396.

Hadi, A.S. 1992, "Identifying Multiple Outliers in Multivariate Data", *Journal of the Royal Statistical Society. Series B (Methodological)*, vol. 54, no. 3, pp. 761-771.

Hague, R. & Harrop, M. 2007, *Comparative Government and Politics*, Pallgrave Macmillan, New York.

Holbrook, T.M. & Van Dunk, E. 1993, "Electoral competition in the American states", *American Political Science Review*, vol. 87, no. 4, pp. 955.

Holmberg, S. 1993, *Lokala väljare - finns dom?*, Göteborgs Universitet.

Hotelling, Harold, 1929, "Stability in Competition" *The Economic Journal*, Vol. 39, No. 153 , pp. 41-57  
Lindbeck, A. & Weibull, J.W. 1987, "Balanced-Budget Redistribution as the Outcome of Political Competition", *Public Choice*, vol. 52, no. 3, pp. 273-297.

Moberg, E. 2004, *Den offentliga sektorns utgifter*, The Ratio Institute.

Mueller, D.C. & Murrell, P. 1986, "Interest Groups and the Size of Government", *Public Choice*, vol. 48, no. 2, pp. 125-145.

Persson, T. & Tabellini, G.E. 2000, *Political economics :explaining economic policy*, MIT Press, Cambridge, Mass.

Persson. Torsten & Tabellini, G. 2000, *Political Economics - Explaining Economic Policy*, MIT Press, Massachusetts.

Pettersson-Lidbom, P. 2007, *Do Parties Matter for Economic Outcomes? A Regression Discontinuity Approach*.

- Pettersson-Lidbom, P. Forthcomming, "  
Dynamic Commitment and the Soft Budget Constraint:  
An Empirical Test", *American Economic Journal*, .
- Redman, D.A. 1993, *Economics and the Philosophy of Science*, Oxford University Press.
- Roemer, J.E. 2001, Harvard University Press, Cambridge, Massachusetts.
- Rogers, D.L. & Rogers, J.H. 2000, "Political Competition and State Government Size: Do  
Tighter Elections Produce Looser Budgets?", *Public Choice*, October 2000, v.105, iss.1-  
2, pp.1-21, .
- Saint-Paul, G. 1996, "Saint-Paul, G., "Exploring the political economy of labour market  
institutions", *Economic Policy*, Nr 23, October 1996, pp. 265-300 ", *Economic Policy*, ,  
pp. 265-265-300.
- SCB 2008, Partisypatiundersökningen (PSU) 2008 - MEO201
- Schön, L. 2000, *En modern svensk ekonomisk historia*, SNS, Stockholm.
- Seay, e.a. 2004,  
*An explanation of the partial adjustment adaptive expectations (PAAE) model*,  
Manuscript edn.
- Solé-Ollé, A. 2006, "The Effects of Party Competition on Budget Outcomes: Empirical  
Evidence from Local Governments in Spain", *Public Choice*, January 2006, v.126, iss.1-  
2, pp.145-76, .
- Stigler, G.E. 1972, "Economic Competition and Political Competition", *Public Choice*, vol. 13,  
no. 1, pp. 91-106.
- Wittman, D.A. 1995, "The myth of democratic failure: Why political institutions are  
efficient", 1995, pp.ix, 229, .
- Wooldridge, J.M. 2009, *Introductory econometrics :a modern approach*, 4th edn, South-  
Western Cengage Learning, Mason, Ohio.
- Wörlund, I. 1999, "Lokala partier i Sverige", *Kommunal ekonomi och politik*, vol. 3, no. 3, pp.  
51-62.

## Appendix A – Supplementary statistics

|  | Variable                   | Variable           |                           |                            |                           |                    |                         |                        |                   |                        |                |
|--|----------------------------|--------------------|---------------------------|----------------------------|---------------------------|--------------------|-------------------------|------------------------|-------------------|------------------------|----------------|
|  |                            | <i>Equityratio</i> | <i>Gov. grants per c.</i> | <i>Net finances per c.</i> | <i>Percent on welfare</i> | <i>Pop density</i> | <i>Percent age 0-15</i> | <i>Percent age 65+</i> | <i>Population</i> | <i>Structural cost</i> | <i>Taxbase</i> |
|  |                            |                    |                           |                            |                           |                    |                         |                        |                   |                        |                |
|  | <i>Equityratio</i>         | 1                  | -                         | -                          | -                         | -                  | -                       | -                      | -                 | -                      | -              |
|  | <i>Gov. grants per c.</i>  | -0,0824            | 1                         | -                          | -                         | -                  | -                       | -                      | -                 | -                      | -              |
|  | <i>Net finances per c.</i> | 0,5159             | -0,1818                   | 1                          | -                         | -                  | -                       | -                      | -                 | -                      | -              |
|  | <i>Percent on welfare</i>  | -0,0545            | 0,0875                    | -0,0553                    | 1                         | -                  | -                       | -                      | -                 | -                      | -              |
|  | <i>Pop density</i>         | 0,1441             | -0,0806                   | 0,2084                     | 0,0469                    | 1                  | -                       | -                      | -                 | -                      | -              |
|  | <i>Percent age 0-15</i>    | 0,0735             | -0,2973                   | 0,0863                     | -0,096                    | 0,035              | 1                       | -                      | -                 | -                      | -              |
|  | <i>Percent age 65+</i>     | -0,0806            | 0,5464                    | -0,1233                    | 0,0202                    | -0,2596            | -0,6534                 | 1                      | -                 | -                      | -              |
|  | <i>Population</i>          | 0,0267             | -0,1191                   | 0,1944                     | 0,222                     | 0,5865             | 0,0161                  | -0,265                 | 1                 | -                      | -              |
|  | <i>Structural cost</i>     | -0,1546            | 0,6439                    | -0,0093                    | -0,3242                   | -0,037             | -0,0535                 | 0,4258                 | -0,064            | 1                      | -              |
|  | <i>Taxbase</i>             | -0,0217            | -0,173                    | 0,2142                     | -0,462                    | 0,3601             | 0,3708                  | -0,2868                | 0,2042            | 0,4432                 | 1              |

Table 4 Pairwise correlation of determinants

|  | Variable                 | Variable      |                  |               |                  |
|--|--------------------------|---------------|------------------|---------------|------------------|
|  |                          | <i>Actual</i> | <i>Predicted</i> | <i>Ratio</i>  | <i>- Ratio</i>   |
|  |                          | <i>Margin</i> | <i>Margin</i>    | <i>actual</i> | <i>predicted</i> |
|  | <i>Actual Margin</i>     | 1             | -                | -             | -                |
|  | <i>Predicted Margin</i>  | 0,989         | 1                | -             | -                |
|  | <i>Ratio measure</i>     | 0,5255        | 0,5178           | 1             | -                |
|  | <i>Ratio - predicted</i> | 0,6067        | 0,6135           | 0,9213        | 1                |

Table 5 Pairwise correlation of competition measures

**Appendix B – List of main variables****TABLE 1 LIST OF MAIN  
VARIABLES**

| <i>Variable Namne</i>                       | <i>Description</i>                                                                                                                                                                                   | <i>Data Source</i>                                             |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b><i>Demographic variables</i></b>         |                                                                                                                                                                                                      |                                                                |
| Percent age 0-15                            | The percentages of population age 0-15                                                                                                                                                               | Statistics Sweden                                              |
| Percent age 65+                             | The percentages of population age 65-                                                                                                                                                                | Statistics Sweden                                              |
| Population                                  | Total population by the last of December.                                                                                                                                                            | Statistics Sweden                                              |
| Pop density                                 | Population per sq kilometer                                                                                                                                                                          | Statistics Sweden                                              |
| <b><i>Socioeconomic variables</i></b>       |                                                                                                                                                                                                      |                                                                |
| Percent income support                      | Percent of the population on income support.                                                                                                                                                         | Statistics Sweden, the National Board of Health and Welfare    |
| Tax base                                    | Taxable income from natural persons.                                                                                                                                                                 | and own calculations<br>Council for Local Government Analysis  |
| Structural cost                             | The cost that the municipality would have if it operated its activities on an average fee, ambition and level of efficiency and given to its own structural factors. SEK per capita and year.        | Council for Local Government Analysis                          |
| Governmental grants per capita              | Intergovernmental grants from national government per capita. Strongly based on the structural cost SEK per capita and year                                                                          | Statistics Sweden                                              |
| <b><i>Economic variables</i></b>            |                                                                                                                                                                                                      |                                                                |
| Equity ratio                                | Municipality equity divided by total assets.                                                                                                                                                         | Council for Local Government Analysis                          |
| Net finances per capita                     | Net financial income/expense. SEK per capita and year.                                                                                                                                               | Council for Local Government Analysis                          |
| <b><i>Spending variables</i></b>            |                                                                                                                                                                                                      |                                                                |
| Total spending per capita                   | The municipalities gross expenses in the mainly tax financed sector less internal revenues and sales to other local authorities. SEK per capita and year.                                            | Council for Local Government Analysis                          |
| <b><i>Municipal political variables</i></b> |                                                                                                                                                                                                      |                                                                |
| Actual Margin                               | The margin between the majority and minority block vote shares in the last election                                                                                                                  | The Election Authority and own calculations                    |
| Predicted Margin                            | The margin between the majority and minority block vote shares in the last election corrected by a national block specific correlation coefficient multiplied by shifts in regional voter sympathy.  | The Election Authority, Statistics Sweden and own calculations |
| Actual Ratio                                | Standard deviation of the present majority block vote share in the covered elections divided by the majority block vote share less 50                                                                | The Election Authority and own calculations                    |
| Predicted ratio                             | Standard deviation of the present majority block predicted vote share in divided by the predicted majority block vote share less 50.                                                                 | The Election Authority and own calculations                    |
| Margin - Left                               | If left is in majority: The margin between the the left and right in the last election with. Otherwise: 0.                                                                                           | The Election Authority and own calculations                    |
| Predicted margin - Left                     | If left is in majority: The margin between the left and right vote share in the last election corrected by a national left specific correlation coefficient and shift in regional voter sympathy for | The Election Authority, Statistics Sweden and own calculations |

the left block. Otherwise: 0.

|                          |                                                                                                                                                                                                                                       |                                                                |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Actual Ratio - Left      | If left is in majority: The standard deviation of the left vote share in the covered elections divided by the left block vote share in the last election less 0,5. Otherwise: 0.                                                      | The Election Authority and own calculations                    |
| Predicted ratio – Left   | If left is in majority: Standard deviation of the present majority block predicted vote share in divided by the predicted majority block vote share less 50. Otherwise: 0                                                             | The Election Authority and own calculations                    |
| Margin - Right           | If right is in majority: The margin between the the right and left in the last election with. Otherwise: 0.                                                                                                                           | The Election Authority and own calculations                    |
| Predicted margin - Right | If right is in majority: The margin between the right and left vote share in the last election corrected by a national right specific correlation coefficient and shift in regional voter sympathy for the right block. Otherwise: 0. | The Election Authority, Statistics Sweden and own calculations |
| Actual Ratio - Right     | If right is in majority: The standard deviation of the right vote share in the covered elections divided by the right block vote share in the last election less 0,5. Otherwise: 0.                                                   | The Election Authority and own calculations                    |
| Predicted ratio - Right  | If right is in majority: Standard deviation of the present majority block predicted vote share in divided by the predicted majority block vote share less 50. Otherwise: 0                                                            | The Election Authority and own calculations                    |
| Left dummy               | A dummy taking the value of 1 if left is in majority and 0 if right is majority.                                                                                                                                                      | The Election Authority and own calculations                    |

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## **Appendix C - Statistical regions by Statistics Sweden and used in the Party Preference Survey.**

- **Greater Malmö** – For the period 1995-2005: Burlöv, Kävlinge, Lomma, Lund, Malmö, Staffanstorps, Svedala, Trelleborg, Vellinge municipality, from 2005 also including Eslöv, Höör och Skurup municipality.
- **Stockholm** – Stockholm municipality
- **Gothenburg** - Gothenburg municipality
- **Småland and the Islands** - Jönköping, Kronoberg, Kalmar & Gotland county)
- **Middle and upper Norrland** - Västernorrland, Jämtland, Västerbotten & Norrbotten County
- **North central Sweden** - Värmland, Dalarna & Gävleborg county
- **Eastern central Sweden** – Uppsala, Östergötland, Örebro & Västmanland county
- **West Sweden excluding Gothenburg** - Halland & Gothenburg and Bohus County excluding Gothenburg municipality
- **South Sweden excluding Greater Malmö** - Blekinge & Skåne county excluding Greater Malmö as defined above
- **Stockholm County excluding Stockholm municipality** - Stockholm County excluding Stockholm municipality