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Strategic use of debt in Flemish municipalities

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Abstract

This paper discusses the literature on strategic use of debt models and empirically tests the seminal models of Persson & Svensson (1989) and Alesina & Tabellini (1990) on a dataset of Flemish municipalities. The literature on strategic use of debt originates from the question whether incumbent policy makers change debt if they expect an electoral defeat. We introduce a vote function to estimate the probability of electoral defeat and present evidence of strategic debt in line with Persson & Svensson (1989), still we only find evidence for leftist governments. Our results also show that coalition governments in particular are more likely to change debt strategically.

1. Introduction

Though tax-smoothing theory (Barro, 1979) suggests that deficits and surpluses are used to minimize the distorting effects of taxation, political economy models not only relate deficits and debt to the business cycle; they also point to the role of the timing of elections when framing fiscal policy.[2] This literature suggests that governments change fiscal policy to attract more votes and to

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[2] Still there are several other political economic models that explain budget deficits, such as the ideological orientation and political fragmentation of the government, the form of the budgetary institutions, the degree of government stability, and so on. See Franzese (2001) for an excellent overview.

increase their chances of getting re-elected.[3] But it are not only governments who believe they have a good chance of staying in office that may change fiscal policy. An interesting finding is that governments expecting to be replaced might adapt fiscal policy too. The time-inconsistency theory of politics (see Kydland & Prescott, 1977; Fischer, 1980) predicts that judgements about the likelihood of a regime change drive policy changes. A government expecting a regime change may opt to follow a second-best policy when this allows to control the fiscal setting of the future government. The creation of debt by the previous government puts a constraint on the new government that will have no choice but to accept it, possibly having to sacrifice parts of its own expenditure programme. This situation is described in the literature on strategic deficit and debt behavior.

In this paper we investigate empirically whether strategic debt behavior is present in Flemish municipalities. Crucial in empirical tests on strategic debt behavior is to find a good proxy for the government's expectation of a regime change. For this purpose most previous empirical analyses on strategic debt models introduce historical political stability information. The novelty of this paper is that the approach taken here is that a variable which measures the probability of electoral defeat should be based on the electorate's determinants to evaluate the government's policy. Therefore, we introduce the literature on vote functions to estimate the probability of electoral defeat.

The remainder of the paper is organised as follows. Section 2 is an overview of the relevant literature. Section 3 formulates some observations on the present state of the research in this field. Section 4 introduces the reader in Flemish municipalities and presents models to estimate the probability of electoral defeat and to empirically test the presence of strategic use of debt. Some extensions are presented in section 5. Finally, concluding comments are given in section 6.

2. The literature

The literature on strategic deficit and debt behavior originates from the question whether incumbent policy makers change debt if they expect not to get into office again.

The strategic use of debt literature arises from the paper of Persson & Svensson (1989) (henceforth PS model). The PS model argues that voters have heterogeneous preferences concerning the size of the government. Some of the voters want the government to provide a significant level of public goods, while others are in favour of less government interference. The PS model assumes that incumbents adapt to the voters' preferences and act accordingly. This model predicts rightist governments awaiting a regime switch to run budget deficits up to a much

[3] For example Alesina *et al.* (1992) find evidence of systematic differences in fiscal and monetary policy in pre-election years.

higher level than when they feel secure about their political future. The idea is to reduce the public spending of the following (leftist) government by creating more debt. Higher levels of debt bring along higher interest charges and thus reduce the scope for policymaking of the next government. The opposite reaction is expected when a leftist government anticipates a regime change. Leftist governments traditionally favour higher public expenditures. The PS model predicts that leftist governments will run a budget surplus if they know they will be succeeded by a rightist government. This budget surplus enlarges the budget of the succeeding rightist government and induces it to spend more than it otherwise would have.

The theoretical work of Persson & Svensson (1989) was followed by the contribution of Alesina & Tabellini (1990) (henceforth AT model), also theoretical in nature. This paper also emphasizes strategic considerations in the formation of debt policy, but from a different viewpoint. While the PS model focuses on the *level* of spending, the AT model assumes that governments differ with respect to their preferences concerning *the composition* of government spending. Again this is a reflection of the voters' preferences. When the government expects to be replaced, it runs a budget deficit which will bring the composition of future public spending closer to its preferences. In fact, the deficit allows the current government to spend more on public goods than it prefers by reducing future spending on the public goods it gets little utility from. Consider, for example, a government which prefers spending on education to road construction and assume that it expects to be replaced by a government with the opposite preferences. The current government could expect that spending on education will be cut by the next government. Therefore it can opt to run up a deficit and spend the extra resources on education as an advance on the spending cut in education that will follow with the take-over of the next government. Today's government thus ties the hands of future governments by allocating future tax revenues to service debt. The marginal cost of repaying the additional debt falls thus on the preferences of the new government, about which the departing government cares little.

The AT model expects a deficit bias irrespective of the government's political ideology; that is, regardless of the government's political preferences, the existence of a strong likelihood of being voted out of office will generate an incentive to issue debt. The AT model thus yields a symmetric prediction on the role of the probability of electoral defeat. The PS model's prediction, on the other hand, is non-symmetric. This model predicts that only right-wing governments issue debt. So whereas in the AT model the probability to be voted out of office raises debt per se, this is only the case for right-wing governments in the PS model.

The AT and PS model differ with respect to the assumptions made concerning the utility functions of the parties. They both assume that the political polarization and the likelihood of a regime switch are major determinants of the pre-electoral debt policy. Fiscal policy will thus be more volatile when governments expect to be replaced than when they don't.

Various authors have extended, criticized or empirically tested the PS and AT models.[4] Lockwood *et al.* (1996) build on the PS model. They assume that two parties alternate in power and have different preferences over the level of public good provision. Lockwood *et al.* (1996) innovate in assuming that incumbents do not care about –or care sufficiently little about– policy outcomes when not in power. Parties in power thus are expected to be myopic near the end of their term of office. Incumbents have the incentive to finance their expenditures by issuing debt, knowing that they will not have to face the consequences of debt financing for a while –the so-called "quasi-finite horizon effect". According to Lockwood *et al.* (1996), this implies that pre-electoral debt expansion is dominating the strategic effects of the PS model, so that in their models strategic effects appear of only secondary importance. Incumbents only have an incentive to use debt strategically to affect their successor's tax and spending decisions insofar as it influences the level of debt that the (current) incumbent party will inherit when it is next returned to power. So, predominantly, the "quasi-finite horizon effect" rules.

The Martimort (2001) model contradicts the expectations of the PS model. The major contribution of the Martimort (2001) model is that it stresses the strategic role of budget deficits when parties differ only with respect to their redistributive concerns[5]. According to Martimort (2001), political regime switching introduces fluctuations in the distribution of utility in the economy. These fluctuations justify strategic budget distortions by governments currently in office and willing to favour their redistributive concerns against the policies of a future government. Contrary to the PS model, Martimort (2001; 573) expects "leftist governments to be more inclined to redistribute income. By running a deficit today, the leftist government ensures that society gets poorer tomorrow. A future rightist government will have to redistribute more. The implemented tax policy will thus be close to what a leftist government would have chosen itself. On the contrary, by running a surplus today, a rightist government relaxes the burden of taxation imposed by tomorrow's leftist government on high income agents. This leftist government will be less eager to redistribute and will adopt the rightist party's behavior."

For empirical research on strategic debt models, we refer to the findings of Pettersson-Lidbom (2001), Lockwood *et al.* (1996), Carmignani (2003), Crain & Tollison (2003), Grilli *et al.* (1991), Lambertini (2003), Franzese (2001) and Ashworth *et al.* (2005).

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[4] Aghion & Bolton (1990), Milesi-Ferretti (1995) and Milesi-Ferretti & Spolaore (1994) also present models that explain the strategic use of debt, but from another point of view. These authors assume that budget deficits are used strategically to influence election outcome. They focus on the impact of debt decisions on the probability of getting re-elected, while in the seminal strategic debt models of AT and PS –the subject of our analysis– the causality is inverse. Therefore we do not go more deeply into these papers.

[5] While each type of government maximizes a social welfare function, a rightist government prefers more allocative efficiency and less redistribution than a leftist government.

Pettersson-Lidbom (2001) and Lockwood *et al.* (1996) present evidence consistent with the PS model. Pettersson-Lidbom (2001) examines the accumulation of debt by Swedish local governments and finds significantly positive effects of the probability of electoral defeat on the accumulation of debt. Using a dataset of 277 municipalities for the period 1974 to 1994, Pettersson-Lidbom (2001) finds strong differences between right- and left-wing governments. As expected by the PS model, right-wing governments accumulate more debt (+15%) when facing a higher probability of defeat, whereas the opposite occurs for left-wing governments (-11%). Lockwood *et al.* (1996) not only build on the PS model theoretically but also test their hypotheses empirically. Using annual data for the United Kingdom on government debt (and taxes and expenditures) for the period 1956 to 1996, their empirical findings are largely consistent with the theoretical expectations (as described earlier).

Carmignani (2003) and Crain & Tollison (1993) build on the AT model and find empirical support for it. For a sample of western European democracies, Carmignani (2003) shows that government instability –when it involves a replacement of decision-makers– increases the size of deficits.[6] Crain & Tollison (1993) employ data from U.S. states covering the period 1968 to 1989 and report that as the likelihood of a government change increases, the volatility of fiscal measures –and specifically taxes and the surplus/deficit levels– increases.

Other empirical studies by Grilli *et al.* (1991), Lambertini (2003), Franzese (2001) and Ashworth *et al.* (2005) find no significant evidence for the strategic use of debt or deficits. Grilli *et al.* (1991) investigate the reasons for the existence of differences in the debt-to-GNP-ratio in 18 OECD countries over the period 1960-1989, but find no evidence that supports the PS or AT models. Lambertini (2003) uses U.S. (1960-1995) and pooled data for 16 OECD countries (1960-1992) to test both the PS model and the AT model. For the U.S. dataset opinion polls are used to measure the probability of being voted out of office, while for OECD countries a probit equation on the probability of government change is estimated. For the AT model, Lambertini (2003) tests whether government outlays on defence are higher under more conservative governments and whether government expenditures on social security and welfare are higher under more liberal governments. For the PS model, Lambertini (2003) investigates whether cyclically adjusted government budget surpluses are lower under conservative than liberal governments. Results show that there is no evidence that confirms the expected effects, irrespective of the model adopted (AT or PS). For none of the datasets as measured by Lambertini (2003) does the probability of being voted out of office have a significant effect on the government budget surplus.

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[6] We find no further information on the entities or on the time period of Carmignani's (2003) dataset. Carmignani (2003; 2) only mentions that the sample comprises western European democracies. At the end of the paper Carmignani (2003; 38) also remarks that the size of the sample is relatively small and that the panel is a pooled cross-section time series.

Franzese (2001) examines the political determinants of debt and deficits for 21 OECD-countries and, like Lambertini (2003), rejects the predictions of strategic use of debt models. Franzese's (2001) bivariate analysis shows that his "risk replacement variable" does not correlate with debts or deficits. As Franzese (2001) points out himself, a bivariate analysis is actually inapt to explore conditional hypotheses like strategic use of debt theories. More importance, he argues, should be attached to his multivariate analyses. His multivariate model, however, provides no support for strategic debt policy. The risk replacement variable is marginally significant and suggests that the probability of being voted out of office provokes governments to engage in debt policy manipulation, but contrary to the PS model, leftist governments increase and rightist governments decrease deficits when the replacement risk increases.

Finally, Ashworth *et al.* (2005) examine the impact of government fragmentation on local government indebtness in Flemish municipalities for the period 1977-2000. Their analysis shows no significant impact of the number of excess seats of the ruling parties on local debt. Therefore they conclude that the lack of a significant impact "indicates a lack of evidence for strategic debt usage in Flanders".

To summarize, the empirical evidence in the literature shows no consensus on whether or not the incumbent's probability of being voted out of office explains pre-electoral debt policy.

3. Discussion

Although different models provide theoretical explanations for budget deficit or debt changes, the empirical evidence is relatively weak. This does not necessarily mean that the strategic models can be refuted. But some observations can be made.

First, the empirical disagreement indicates that fiscal decisions are the outcome of a more complicated political process. Variables other than the probability of being voted out of office also seem to matter for fiscal policy. Lambertini (2003) suggests that macro-economic and other exogenous events not accounted for in the PS or AT models also explain budget deficits or surpluses. To reduce the impact of these exogenous events, it might be advisable to look for evidence of the strategic use of debt behavior on single-country data, so that the impact of these types of events is constant over all observations. Consequently it is not coincidental that Pettersson-Lidbom (2001) finds evidence of the existence of the strategic use of debts when analysing Swedish municipalities.

Second, we could question whether evidence of the strategic use of debt models can be found outside two-party systems or similar situations. The AT model is developed in a two-party environment. The PS model explains the behavior of "a" rightist government expecting to be replaced by "a" leftist government or vice versa, but gives no consideration to the precise

composition of each government. The empirical tests that support the strategic use of debt models have all been performed on governments operating within a two-party system.[7] But what if more than two parties are running for government? On the one hand the strategic use of fiscal policy could become less attractive the larger the coalition becomes. This is because increasing debt might reduce the future policy options of one or more of the coalition partners who might return to office as members of a new coalition. This is not unlikely in coalition governments since the probability that at least one of the members stays in office increases the higher the number of coalition partners. Grilli *et al.* (1991) also point out that changes in coalition governments are rarely due to a total breakdown of the underlying coalition. On the other hand, Ashworth *et al.* (2006) state that parties in a coalition are on average less certain of future power than parties not sharing power. Indeed, coalition parties not only have to 'win' the elections; they also have to survive the ensuing coalition negotiations. Hence, their shorter time horizon may lead coalition governments to be more sensitive to the strategic use of debt. Consequently fragmented governments are expected to more strongly (and consciously) engage in debt creation in election years. The role of fragmentation in strategic debt models thus should be clarified.

Third, the theoretical PS model assumes that incumbents know that they will be replaced. What about the situation when electoral uncertainty leads to uncertainty about the nature of succeeding governments? Although Persson & Svensson (1989; 342) conjecture that uncertainty about whether the current government will remain in power or not would not fundamentally change their findings, Alesina & Tabellini (1990) introduce uncertainty in their theoretical model. In fact, empirical models also differ from the PS model and introduce a variable that measures the probability of electoral defeat to take into account uncertainty. Reviewing the literature, we find as many approaches to calculating that probability as there are empirical studies on the strategic use of debt. In addition to differences in model specification –such as time period, sample or differences in the definition of what is seen as deficit or debt– we suggest that the definition of the crucial variable concerning re-election prospects may explain the inconsistency in the empirical findings. We do not dispute that what moves governments to act strategically (or not) before elections is their assessment of upcoming electoral outcomes. We only address disagreement in the construction or measurement of that crucial variable.

4. Empirical analysis

The setting of our empirical analysis follows from the considerations above. We empirically test the existence of strategic debt models on single-country data. Our dataset consists of 294 Flemish municipalities covering four election periods (1982, 1988, 1994 and 2000). Though there are 308

[7] Although Swedish local governments operate in a multi-party system, Pettersson-Lidbom (2001; 575, footnote 10) reduces his dataset to a two-party environment, only taking into account strict left- or right-wing governments. Undefined governments, that is when neither left-wing nor right-wing parties constitute a majority, are removed from the dataset.

municipalities, data unavailability precludes the use of more than these 294. In Flemish municipalities multiple parties with various ideological characteristics compete for office in a system of proportional representation. Therefore our analysis will take into account ideological differences as well as possible fragmentation effects. Finally, we take into account uncertainty about future government participation. Our crucial variable to proxy the probability of electoral defeat is not constructed ad hoc, but is derived from the literature on vote functions.

First we discuss some characteristics of Flemish local governments. Second we introduce a vote function to proxy the probability of electoral defeat. Third we test the presence of strategic use of debt in Flemish municipalities. Finally some extensions to the analyses are presented.

4.1 Flemish municipalities

Flemish local governments have a parliamentary system consisting of the local council (the legislative body) and the College of Mayor and Alderman (the executive body). Seats in the council are allocated using a system of proportional representation. The composition of the College is determined by the party (or parties) holding a majority position in the council. Elections are hold every 6 years and incumbents can be indefinitely re-elected (i.e. there are no binding term limits).

Flemish municipalities enjoy a far-reaching autonomy in their fiscal policies. Taxation and grants from higher levels of government (which are for the most part unconditional) are important sources of revenue. Expenditures may also be financed through debt-financing. Flemish municipalities can arrange public loans, still they borrow almost exclusively from private banks.

The fiscal year runs parallel to the civil year in Belgium (from 1 January to 31 December). Prior to the fiscal year, a balanced budget needs to be agreed upon. The presentation of the budget is a responsibility of the College. The budget is discussed by the College of Mayor and Alderman and is brought before the local council for ratification. Only when the budget is endorsed before 31 December, it can be executed.

4.2 Expectation of electoral defeat

The strategic debt models assume that governments that expect to be replaced will change debt before elections. Crucial in these models is the introduction of a measure for the probability of electoral defeat. Pettersson-Lidbom (2001), Carmignani (2003) and Lambertini (2003) create each a –different– auxiliary equation that links the unobserved variable, that is, the expectation of electoral defeat, to a set of observable variables that might be expected to affect the probability of electoral defeat. The Pettersson-Lidbom (2001) set of explanatory variables is restricted to historical voting patterns and the frequency of previous government changes. Franzese (2001), Grilli *et al.* (1991), Ashworth *et al.* (2005) and Crain & Tollison (1993) also use historical stability variables. Franzese (2001) launches a "replacement risk variable", which is simply the inverse of

the actual duration in years of the incumbent's mandate, i.e., the hazard rate of losing office in a year. Grilli *et al.* (1991) use the frequency of government changes in the past, while Crain & Tollison (1993) measure the probability of no regime change from historical seats shares. Ashworth *et al.* (2005) use the number of seats in excess of a simple majority (since previous elections). Carmignani (2003) estimates the probability of government termination by a probit analysis with different variables. Besides the stability of the government in the previous year, political fragmentation, political polarization and GDP growth in the current and previous year are introduced into the equation. Lambertini (2003) introduced two constructs to estimate a government's prospects. She first estimates an index of political affiliation of the government, calculated on election dates, change-of-government dates, the direction of the change in government and the ideological position of the government. A change in the value of the index is thus a change in the government in the Lambertini (2003) model. Secondly, in her analysis on U.S. data, she introduces opinion polls as proxy for the probability of electoral defeat.[8]

Different authors used different methods to estimate the probability of electoral defeat. The question of what a good proxy might be remains open. We are conscious that the real expected probability of re-election or electoral defeat is hard to measure. The literature so far is focused on historical political stability determinants only. As well as these, other determinants, such as economic, tax and political variables, may explain whether incumbents get re-elected or not. Ultimately, when judging the probability of electoral defeat, incumbents need to assess voters' likely behavior in the voting booth. It thus becomes important for incumbents to evaluate the relevant determinants that voters have in mind when voting for or against the current government. The determinants of voting behavior have been studied intensively in the literature on vote functions (see e.g. Paldam & Schneider, 1980; Nannestad & Paldam, 1994, Lewis-Beck & Paldam, 2000; Revelli, 2002; Vermeir & Heyndels, 2006; Geys & Vermeir, 2008). In general these functions explain the vote (or the change in the vote) for the government at elections by (the change in) political, economic and tax variables (Nannestad & Paldam, 1994). Though part of the political variables are historical stability variables, vote functions are not restricted to these.

The novelty of this paper is that we introduce a vote function to measure the expectation of the probability of electoral defeat. Mughan (1987; 198) makes clear that the primary purpose of vote functions should be forecasting –"predicting the outcome of an event before it occurs"– instead of explaining. Norpoth & Gschwend (2003) also show that a model based on the insights from electoral research could be a good instrument to predict the level of votes cast for incumbents. In

[8] We do not dispute the accuracy of opinion polls, but we are not convinced that this is the best proxy for the government's expectation of electoral defeat in a multiparty system. Typically, and as in Lambertini (2003), opinion polls do not poll for the continuation of the government, which is the crucial variable in the literature on the strategic use of deficits or debt, but for the intention of the electorate to vote for a specific party or a specific candidate. Therefore, although opinion polls can be used to estimate the probability of electoral defeat in a two-party system, this is not obvious in a multi-party system as in our dataset.

this paper we will use the insights of vote function models to estimate the probability of electoral defeat of the incumbents. If they expect not to remain in power, the incumbents could decide to act strategically.

In our analysis we estimate the prospects of electoral defeat from the Vermeir & Heyndels' (2006) vote function for Flemish municipalities. To test whether yardstick voting is present in Flemish municipalities, Vermeir & Heyndels (2006) empirically analyse the votes at municipal elections. They find that incumbents are punished for higher tax rates. Moreover, the electoral punishment depends on the tax rates in neighbouring municipalities, so empirical evidence of yardstick competition is provided. Next to the tax variables –the focus of the Vermeir & Heyndels (2006) research– their analysis also contains political and economic variables. As such their model is a good starting point given the purpose of this paper.

Still, our aim is not explaining votes, but estimating the incumbents' *judgement* of their electoral prospects. Next we introduce these prospects in the explanation of debt policy changes in election years. Therefore we first reconstruct Vermeir & Heyndels' (2006) vote function. Second, we will apply this function on the pre-electoral years' values of its explanatory variables to calculate the government's vote expectations. This adjustment is necessary as Flemish local governments have to endorse the (Balanced) Budget before December 31 of the year before. If incumbents would like to act strategically in the election year, changes in the level of debt thus should be agreed on in the year before elections. The decision whether or not to change local debt strategically in election year t thus has to be made in year t-1. Indeed, incumbents have to judge their electoral prospects one year before elections. Given both the role of each of the explanatory variables in the vote percentage and their values in the pre-election year t-1, we can generate the expected number of votes of the government at the timing of the Budget.

First, we reconstruct Vermeir & Heyndels' (2006) vote function estimation as presented in equation (I.) that explains the percentage of votes the incumbent party (or parties[9]) receives at the elections in year t :

$$(I.)\quad V_{it} = \alpha_1 + \alpha_2 V_{it-6} + \alpha_3 TAX_{it} + \alpha_4 NTAX_{it} + \alpha_5 EXP_{it} + \alpha_6 NEXP_{it} + \alpha_7 NTI_{it} + \alpha_8 UNEMPL_{it} + \alpha_9 NPAR_{it} + \text{year dummies} + \text{party dummies} + u_{it}$$

where: i = 1,..., N; t = election years

V_{it} represents the vote percentage of the government party (parties) of municipality i in election year t. The first explanatory variable is the vote percentage of the same government party (parties) in the previous elections (V_{it-6}). The coefficient of V_{it-6} is expected to have a positive impact on the number of

[9] The vote share corresponds with the sum of the shares of the coalition partners in the case of coalition governments.

votes.[10] TAX_{it} is a vector of tax instruments and includes the local income tax rate ($LITR_{it}$) and the local property tax rate ($LPTR_{it}$). We expect the tax rates to have a negative impact on the vote percentage. Per capita public expenditure (EXP_{it}) is included to measure for the quantity (and/or quality) of public output. A positive impact on the votes is expected from this. We refer to the theory of yardstick voting –which suggests that voters compare their own municipality to their neighbouring municipalities when deciding on their vote (Besley & Case, 1995 and Revelli, 2002)– to include tax variables of neighbouring municipalities ($NTAX_{it}$). We introduce the average local tax rates of the neighbouring municipalities ($LITRN_{it}$ and $LPTRN_{it}$)[11]. Also the average per capita expenditures ($NEXP_{it}$) of the neighbouring municipalities is introduced. Average local tax rates of neighbouring municipalities are expected to positively affect the votes, while negative values are anticipated for the average per capita expenditures of the neighbouring municipalities. As the literature on economic voting suggests that governments are held accountable for economic developments, net taxable income (NTI_{it}) and the unemployment rate ($UNEMPL_{it}$) are introduced.[12] Income is expected to have a positive effect on votes, while the opposite is true for unemployment. Political characteristics enter vote function (I.) through the number of government parties ($NPAR_{it}$) which measure for clarity of accountability.[13] More coalition partners are expected to reduce transparency. Fragmented governments are thus held less accountable for positive and negative developments (Powell & Whitten, 1993). As governments are more punished for negative developments than they are rewarded for positive developments, Nicholson & Segura (2002) show that fragmented governments generally suffer smaller electoral losses. A positive effect of the number of government parties on the vote is thus expected. The possibility of vote swings among government parties is another possible explanation for a positive coefficient as it is less clear which party voters might hold responsible for policy. Year dummies are introduced to capture possible year effects.[14] Finally, party year dummies are introduced, as Heath *et al.* (1999), Jérôme & Lewis-Beck (1999) and Revelli (2002) show that local election results reflect national party popularity rather than the appreciation of local developments and policies. The impact of national or regional politics on local elections is captured by the inclusion of party dummies

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[10] Two remarks concerning this variable. First, this variable is not strictly a lagged dependent variable. This could be a lagged dependent variable, but only when the previous government stayed in office. Second, the definition of this variable implies that the dataset does not contain data of all Flemish municipalities. Sometimes it is impossible to calculate previous election results of the government. Parties may split up, merge with another party or change their names. Also parties can disappear and not compete in next elections or a member of the government can change parties. The dataset –that corresponds with that of Vermeir & Heyndels (2006)– only contains observations of which previous election results can be indisputably calculated. We thus are confronted with an unbalanced panel as we do not have observations for every election in every municipality. Finally our dataset contains 688 observations of 294 (out of 308) municipalities.

[11] All "neighbouring" variables are estimated as the unweighted average of the values of the Flemish neighbouring municipalities. For Flemish municipalities across the language boundary, only Flemish neighbours are taken into account.

[12] Remark that these economic variables are the result of macro-economic policy which is mainly a federal and regional responsibility. Despite their objective to interfere local governments may still have a (marginal) influence or may be held accountable by the electorate. Local governments can e.g. approve the layout of additional company grounds or decide to lower local company taxes to stimulate local economic activity.

[13] Vermeir & Heyndels (2006) do not enter a measure for the government's ideology in their vote-function. We tested the impact of the ideological complexion of the government on the votes but find no significant effect.

[14] Year effects are introduced to measure the electoral change common to all governments in a certain year, e.g. the electoral rise of the extremist party Vlaams Blok (Vlaams Belang).

for the five national parties that participated in municipal governments and this for each election year.[15]

We intend to use the Vermeir & Heyndels (2006) vote function as an instrument to estimate the probability of electoral defeat. Therefore, we first reconstruct the results of Vermeir & Heyndels' (2006) vote function as close as possible. They tested different approaches, including pooled OLS regressions, OLS regressions including fixed municipality effects, 2SLS regressions with and without municipality fixed effects and conclude that their preference goes to the 2SLS regression without municipality effects (Vermeir & Heyndels, 2006; 2295).[16] Therefore we estimate equation (I.) technically analogous to Vermeir & Heyndels (2006) and use a 2SLS approach –without municipality effects– in which internal and neighbouring tax variables are instrumented.[17] Frey & Schneider (1978) and Schneider & Pommerehne (1980) show that tax variables in the UK and Australia respectively may not be assumed to be exogenous, as the level of popularity affects tax policy. We thus may expect that the error term is correlated with the tax rates. Neighbouring tax variables are instrumented because the presence of spatial correlation in the error is suggested by Revelli (2002) and Solé Ollé (2003) in their models on tax mimicking. We follow Vermeir & Heyndels (2006) by instrumenting own tax rates and per capita expenditures by the percentage of young people and elderly, the average sale price of small and middle sized houses and the number of inhabitants. Tax rates and per capita expenditures of neighbouring municipalities are similarly instrumented. The Sargan tests on the validity of the instruments indicate that the instruments are valid.[18] Table 1 presents the results of the estimation. Descriptive statistics of the explanatory variables are shown in Table A1 on p. 30 in appendix.

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[15] We introduced dummies for the liberal democratic VLD, for the social democratic SP.a, for the Christian democratic CD&V, for the ecologist GROEN! and for the nationalist VU. The extreme-right Vlaams Blok (Vlaams Belang) participates in none of the local governments. Some of these parties changed their name during or after the years under investigation.

[16] We refer to Vermeir & Heyndels (2006) for an overview of the results of all tested approaches.

[17] These "neighbouring tax variables" are the local income tax rate, the local property tax rate and per capita expenditures.

[18] The Sargan test tests the validity of the instrumental variables. Under the null hypothesis that all instruments are valid – they are uncorrelated to some set of residuals– the Sargan statistic is Chi^2 distributed with R degrees of freedom (R being the number of instruments minus the number of estimated parameters). If we fail to reject the hypothesis –which is the case in our model, since p exceeds the value 0.10– the instruments are acceptable.

Table 1 IV estimation of the vote share of the government parties in election year t

Dependent variable : Vote share of the government parties (V_{it})	(1)	(2)
Intercept	40.814 *	15.233
	(1.67)	(1.22)
Prior vote (V_{it-6})	0.760 ***	0.757 ***
	(15.91)	(17.89)
Local income tax rate ($LITR_{it}$)	-6.733 **	-5.413 ***
	(-2.08)	(-3.51)
Local property tax rate ($LPTR_{it}$)	0.003	-
	(0.18)	
Per capita expenditures (EXP_{it})	-2.642	-
	(-0.39)	
Local income tax rate neighbours ($LITRN_{it}$)	4.977	7.050 ***
	(0.81)	(2.71)
Local property tax rate neighbours ($LPTRN_{it}$)	-0.004	-
	(-0.17)	
Per capita expenditures neighbours ($NEXP_{it}$)	-17.077 **	-12.643 ***
	(-2.46)	(-3.12)
Net taxable income (NTI_{it})	-1.978	-1.666 ***
	(-1.55)	(-3.18)
Unemployment rate ($UNEMPL_{it}$)	-2.481	-
	(-0.03)	
Number of government parties ($NPAR_{it}$)	2.197 *	2.157 ***
	(1.73)	(3.60)
1994 year effect (Y_{94})	5.916 **	-
	(2.08)	
2000 year effect (Y_{00})	3.292	-
	(1.02)	
Party effects	Yes	Yes [19]
Wald test party effects : F (p-value)	1.355	8.520 [20]
	(p=0.17)	(p<0.01)
R^2	0.238	0.298
Adjusted R^2	0.208	0.291
Sargan test of overidentifying restrictions (p-value)	2.529	2.372
	(p=0.28)	(p=0.80)

Note : N=688; Values in parentheses are t-values (except for Sargan and Wald tests, where p-values are presented); * significant at 10%, ** at 5% and *** at 1%.

In this table, column (1) provides the most general results, while in column (2) only the statistically significant variables are maintained and as such provide the most efficient estimation. We focus on the latter. The prior vote (V_{it-6}), the municipality's own local income tax rate ($LITR_{it}$), the average local income tax rate in the neighbouring municipalities ($LITRN_{it}$), the average per capita expenditure in the neighbouring municipalities ($NEXP_{it}$), the net taxable income (NTI_{it}) and the number of parties ($NPAR_{it}$) have a significant impact on the vote percentage of government parties. All significant variables have the expected signs and the coefficients are highly comparable to Vermeir & Heyndels (2006).[21]

It is clear from Table 1 that local tax policy has an impact on election results. The regression results show that the government's local income tax rate negatively influences the vote percentage.

[19] Vermeir & Heyndels (2006) present results with and without party-year dummies. As their regression with party-year dummies has the highest adjusted R^2, we reconstruct their model including those dummies.

[20] Insignificant party dummies are left out. The Wald test is performed for the remaining party dummies.

[21] We compare to Vermeir & Heyndels' (2006) 2SLS results as presented in column (4) of (their) Table 5 (on p. 2294).

High local income tax rates are thus electorally costly, while there is no evidence that local property tax rates have an impact on the votes for the government.

The average local income tax rate of the neighbouring municipalities affects the vote percentage positively, so voters use the tax policies of surrounding municipalities as a yardstick. Per capita expenditures in neighbouring municipalities have a negative effect on the vote percentage, while there is no significant impact of the expenditure level in the municipality itself.

Also political variables are of importance when explaining the vote percentage. The number of government parties presents a positive coefficient, confirming that fragmented governments lose fewer votes. With regard to the party-year effects, we only find the dummy for the liberal party in 2000 to present a significant coefficient.[22]

Finally, there is evidence that voters hold local governments responsible for macro-economic policy as NTI_{it} has a significant negative sign. Vermeir & Heyndels (2006; 2292) refer to the 'clientele hypothesis' by Rattinger (Rattinger, 1981 & 1991) as this may explain that "at lower levels of income, voters tend to stay with or go back to traditional government parties". The lack of a significant impact of $UNEMPL_{it}$ suggests that voters do not hold local governments responsible for employment policy. Indeed, "most policy instruments to fight unemployment are in the hands of the federal an regional government"(Vermeir & Heyndels, 2006; 2292).

The next step is to generate the *forecasted values* of the vote percentage. For each observation we generate the forecasted value of the vote percentage from the vote function as estimated in Table 1 using one year lagged values for the explanatory variables.

In Table A2 on p. 30 we present some statistics on both the forecasted values resulting from the preceding analysis (V^f_{it})[23] and the outcome of elections (V_{it}). Mean, median and maximum values are highly comparable. The histograms show that also the frequency distribution of both series is comparable. The correlation between the two values is 0.62. Whether or not these forecasted values explain strategic debt policy is estimated in the following section.

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[22] The coefficient of this dummy is 3.761 ($t=2.92$, $p<0.01$) providing evidence that the Liberal party benefits at the local level from its electoral success at the Federal and regional government level. At both government levels, The Liberal party won the 1999 elections, re-entered the governing coalitions and delivered the prime ministers.

[23] To indicate that we use forecasted values, we add an "f" to V_{it}.

4.3 Strategic use of debt

In this section we test for the existence of the strategic use of debt in Flemish municipalities. In general, we look for evidence whether or not the change in debt in election years is directed by the government's vote expectation. The theory of the strategic use of debt predicts governments not expecting to be re-elected in the next election to change debt. If so, the change of debt in election years should be a function of the governments' re-election prospects. To empirically test this hypothesis, we run regression (II.), which explains debt policy changes in election years:

(II.) $\Delta DEBT_{it} = \beta_1 + \beta_2 PED_{it} + X_{it} + u_{it}$;
where : i = 1,..., N; t = election years 1988, 1994, 2000

The dependent variable $\Delta DEBT_{it}$ measures the year-to-year change in debt per capita in election years and is explained by the probability of electoral defeat (PED_{it}) and some control variables (X_{it}).

We build on the estimation of the vote percentage (V^f_{it}) from the previous section to take into account the government's prospects of electoral defeat. We transform V^f_{it} to a dummy variable (PED_{it}) that takes value 1 if the government does not expect to get a majority of the votes at the next elections –and thus is expected to be voted out of office– and 0 if it expects to get its mandate renewed. In other words, this dummy variable gets value 1 if the forecasted vote percentage (V^f_{it}) is below majority ($V^f_{it}<50\%$) and 0 otherwise. This operationalisation is inspired by Norpoth & Gschwend (2003) who find that governing coalitions whose parties obtain a majority in an election usually remain in office. In line with Norpoth & Gschwend (2003) we assume that governments that regain a majority of the votes stay in office, while those who fail in that objective are replaced by a new government. Dummy variable PED_{it} takes this assumption into account.

Like Pettersson-Lidbom (2001), we try to discriminate between the PS and AT models. According to the AT model we may expect governments with expectations of defeat to issue debt irrespective of their political ideologies. Conversely, the PS model predicts that only rightist governments issue debt when they expect to be replaced, while leftist governments are expected to do the opposite. The introduction of an interaction variable with product terms PED_{it} on the one hand and dummy variable $LEFTMAJ_{it}$ on the other hand permits to distinguish between the two models.

$LEFTMAJ_{it}$ equals 1 if leftist parties have at least 50% of the seats in the College and 0 otherwise.[24] To test these different models we extend equation (II.) to :

(III.) $\Delta DEBT_{it} = \beta_1 + \beta_2 PED_{it} + \beta_3 LEFTMAJ_{it} * PED_{it} + \beta_4 LEFTMAJ_{it} + X_{it} + u_{it}$;
where : i = 1,..., N; t = election years

To find out whether our analysis presents evidence of the strategic use of debt, then in estimation (III.) we should focus on β_2 and β_3. Whether strategic debt behavior is in line with the AT or the PS model depends on the interpretation of both coefficients simultaneously. If β_2 is significantly positive, while the interaction variable β_3 remains insignificant, there is support for the AT model, as governments –irrespective of their political ideologies– expecting an electoral defeat increase debt. Should the following three conditions be fulfilled, that is β_2 is significantly positive, β_3 is significantly negative and $(\beta_2 + \beta_3)$ is negative, there is evidence for the PS model, in which leftist governments anticipating an electoral defeat decrease debt, while other governments with the same prospects increase debt.

Variable X_{it} in equation (III.) stands for variables affecting debt policy. Although we expect strategic motivations for the change of debt, other determinants may also explain this change.

First we take into account the level of debt in pre-election years ($DEBT_{it-1}$). This variable can have opposing effects on the level of debt changes. On the one hand we may assume that governments with low debts have more "margin" to increase debt than governments with higher debt levels. Conversely, highly indebted governments are expected to be more unresponsive to increase debt as this would worsen their financial position all the more. An additional increase of debt raises –ceteris paribus– the cost of debt, that for its part may lead to an additional need for debt financing. Still this expected unresponsiveness may be unrealistic. Indeed, high levels of debt may become self-reinforcing. This is called the "snow ball effect" and should result in a positive sign. The sign of $DEBT_{it-1}$ thus is a priori unknown.

The change in the inhabitants' net taxable income (ΔNTI_{it}), measured as the year-to-year change in the net taxable income per capita, can have two (opposing) effects on the evolution of the level of debt (Ashworth *et al.*, 2005). On the one hand ΔNTI_{it} is an indication of the change of the fiscal capacity of the municipality –as much of the local revenue comes from local income tax. An increase of the net taxable income may reduce the need for loan financing, thus a negative sign

[24] For the definition of our dummy variable $LEFTMAJ_{it}$ we take into account the number of seats of the Socialists and of the Ecologists. Deschouwer (1996) & Rihoux (2001) position the Christian Democrats, the Nationalists and local parties at the centre. The Ecologists and the Socialists are at the left of the centre, while the Liberals are at the right of the centre. The anti-immigrant party Vlaams Blok is at the extreme right of the spectrum. Thus in our analysis, we distinguish between leftist parties ($LEFTMAJ_{it}$=1) and parties on the centre or on the right of the centre ($LEFTMAJ_{it}$=0). This approach is in line with Pettersson-Lidbom (2001).

can be expected. On the other hand, ΔNTI_{it} may indicate changes in the demand for public goods and may increase this need for debt financing. This may lead to a positive sign (Geys, 2007). Taking both effects together, the sign of ΔNTI_{it} is a priori uncertain.

Not only changes in the taxable income, also changes in demographic and socio-economic variables may lead to changes in the demand for public expenditures and have an effect on debt evolution (Ashworth *et al.*, 2005 & Geys, 2007). Therefore we introduce the changes in the proportion of young inhabitants ($\Delta YOUNG_{it}$), changes in the proportion of elderly inhabitants (ΔOLD_{it}), changes in the unemployment rate ($\Delta UNEMPL_{it}$) and changes in the number of inhabitants (ΔPOP_{it}) in estimation (III.). These variables are the year-on-year change of the percentage of inhabitants that are, respectively, below 20, over 64 and unemployed and the year-on-year change of the number of inhabitants. Each time positive coefficients are expected because higher levels of young, elderly and unemployed could represent a higher demand for specific heavy capital expenditures such as schools, care of the elderly or social housing, leading to higher levels of public debt (Bahl & Duncombe, 1993), while an increase in the number of inhabitants represents the need for additional public services and infrastructure in general.

The change of debt may also respond to the financial costs of borrowing (Ashworth *et al.*, 2005 & Geys, 2007). The idea is that an increasing cost of borrowing restrains rational governments from increasing debt financing. Besides the level of debt, borrowing costs depend on the real interest rate on long-term (federal) government bonds. We introduce this rate's year-to-year change ($\Delta INTEREST_{it}$) to measure changes in the cost of borrowing. A negative sign is expected.[25]

Also political variables have received attention as determinants of debt policy before (see e.g. Alesina & Perotti, 1994; Gärtner, 2000; Ashworth *et al.*, 2005). In our regression, ideological differences are taken into account by the introduction of dummy $LEFTMAJ_{it}$. We expect a positive value here, as in public finance literature it is widely accepted (see Hibbs, 1977) that leftist governments have higher spending, which we may assume that they are at least partly financed by debt. Leftist governments thus are expected to increase debt more easily. Higher spending may also be expected for fragmented governments. The Weak Government Hypothesis (Roubini & Sachs, 1989a,b) attributes higher public spending to more fragmented (or divided) governments because several conflicting political objectives have to be accommodated. Fragmentation thus may more easily lead to an increase in debt. We introduce the number of government parties ($NPAR_{it}$) to measure the effect of fragmentation. However, its effect on $\Delta DEBT_{it}$ may not be linear. We refer to Ashworth *et al.* (2005 & 2006), Geys (2007) and Goeminne *et al.* (2008) who have previously found a non-linear effect of government fragmentation on Flemish local governments' fiscal decision-making. As a matter of fact Geys (2007; 246) finds that "in election years […] the

[25] Note that the interest rate varies over time but not over municipalities, it thus can only explain within municipality variation and not between municipality variation.

growth rate of local public debt is lower for one-party governments compared to large coalitions". Consequently, we then test a non linear specification, adding the squared term $NPAR^2_{it}$.

Finally we introduce year-dummies to capture year effects.

Replacing X_{it} in equation (III.) with these control variables, we estimate the following equation:

$$(IV.)\quad \Delta DEBT_{it} = \beta_1 + \beta_2\, PED_{it} + \beta_3\, LEFTMAJ_{it} * PED_{it} + \beta_4\, LEFTMAJ_{it} + \beta_5\, DEBT_{it-1} + \beta_6\, \Delta NTI_{it} + \beta_7\, \Delta YOUNG_{it} + \beta_8\, \Delta OLD_{it} + \beta_9\, \Delta UNEMPL_{it} + \beta_{10}\, \Delta POP_{it} + \beta_{11}\, \Delta INTEREST_{it} + \beta_{12}\, NPAR_{it} + + \beta_{13}\, NPAR^2_{it} + \text{year dummies}_t + u_{it};$$

where : i = 1,..., N; t = election years

Table 2 presents the results of the debt change estimation. A linear regression on panel data with random effects is implemented and covers data from 294 of the 308 Flemish municipalities.[26] Since our number of years is small and the number of cross-sectional units is rather large, random effects model estimators are more efficient than fixed effects model estimators (Gujarati, 2003; 651). Moreover, introducing a fixed effects model would be expensive in terms of degrees of freedom since we have only three time series of data. The Hausman tests we present also suggest that it is safe to use random effects.[27]

Before estimating our model, we test for the existence of multicollinearity in our dataset. Therefore we run a correlation analysis. The correlation matrix indicated that the pair wise correlation coefficient of $\Delta YOUNG_{it}$ and the year dummy for 2000 ($r=-0.97$) exceeds the suggested threshold of $|r|>0.80$ (see Gujarati, 2003; 359). Therefore we shift the year dummy from the analysis.

Table 2 presents results of the OLS estimation (with random effects) of per capita debt change in election years. Column (1) presents results including all variables. A more efficient regression in which insignificant variables are omitted is presented in column (2). Descriptive statistics of the explanatory variables are shown in Table A3 on p. 31 in appendix.

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[26] We continue on the dataset used to estimate the vote-function. In addition we lose one more observation as we do not have data for the level of debt per capita in 1993 for the municipality Aarschot.

[27] A Hausman test controls whether the H_0 that the coefficients estimated by the random effects estimator are the same as the ones estimated by the fixed effects estimator. The insignificant p-values presented in our model indicate that we fail to reject the H_0 and allows us to use random effects.

Table 2 Estimation results of the debt change function, using OLS with random effects

Dependent variable : $\Delta Debt_{it}$	(1)	(2)
Intercept	-1.327	34.481 ***
	(-0.05)	(5.20)
PED_{it}	6.500	-
	(0.69)	
PED_{it} * $LEFTMAJ_{it}$	-9.536	-
	(-0.39)	
$LEFTMAJ_{it}$	-4.827	-
	(-0.34)	
$DEBT_{it-1}$	0.018	-
	(1.62)	
ΔNTI_{it}	55.006	-
	(1.44)	
$\Delta YOUNG_{it}$	2973.019 **	3259.128 **
	(2.07)	(2.30)
ΔOLD_{it}	5345.037 **	5559.006 **
	(2.085)	(2.20)
$\Delta UNEMPL_{it}$	17.770	-
	(0.03)	
ΔPOP_{it}	0.003	-
	(1.34)	
$\Delta INTEREST_{it}$	127.806 **	147.184 ***
	(2.44)	(2.89)
$NPAR_{it}$	22.964	-
	(0.94)	
$NPAR^2_{it}$	-5.585	-
	(-0.94)	
Time dummy variable (1994)	-45.681	-57.034 *
	(-1.48)	(-1.88)
R^2	0.055	0.043
Adjusted R^2	0.036	0.038
Hausman (p-value)	11.52 (p=0.56)	

Note : N=687; t-values between brackets (except for the Hausman tests where p-values are presented); * significant at 10%, ** significant at 5% and *** significant at 1%.

Before focusing on the strategic debt hypotheses, we cast a quick glance at the control variables. First we refer to the absence of significant coefficients of the fragmentation variables. Government fragmentation thus seems to have no impact on debt changes in election years. Turning to the other control variables, we find significant positive coefficients for $\Delta YOUNG_{it}$, ΔOLD_{it} and $\Delta INTEREST_{it}$. For $\Delta YOUNG_{it}$ and ΔOLD_{it} this sign is in line with the expectations. If the percentage of young and elderly in the entire population changes by 1%, debt changes in the same way by respectively 32.59 and 55.59 euros per capita. For $\Delta INTEREST_{it}$ a negative coefficient was anticipated. While we expected governments to restrain from increasing debt financing when the cost of borrowing increases, the results show that an increase of the borrowing cost (by 1%) results in an increase of debt (per capita of 147.18 euros). Obviously governments do not succeed in reducing debt when costs increase, on the contrary they seem to engage additional debt to finance the increased cost of borrowing. This is in line with the so-called "snowball effect" and shows the perverse effect that high interest rates may have on indebtedness. This effect is also found by Ashworth *et al.* (2005) and Geys (2007). There is no indication that $DEBT_{it-1}$, ΔNTI_{it}, $\Delta UNEMPL_{it}$ or ΔPOP_{it} affect debt changes in election years. Nor $LEFTMAJ_{it}$ presents a significant coefficient. Finally, the dummy variable for the year 1994 does present a significant coefficient. The negative value of this coefficient suggests that in that year debt increases are less strong.

Focusing on the strategic debt hypotheses, we do not find support for the strategic use of debt in Flemish municipalities. The most efficient estimation shows that governments that do not expect re-election have no significantly different level of debt in election years, as PED_{it} fails to present a significant coefficient. Neither the interaction variable (PED_{it} * $LEFTMAJ_{it}$) is significant. From this results there is no indication that Flemish municipalities that do not expect to get a majority of the votes strategically change debt in election years.

5. Extensions

The findings in the previous section fail to confirm the existence of strategic use of debt in Flemish municipalities. Still, some extended analyses could be done.

First, we test different levels of vote expectations to construct PED_{it}. We should remark that the construct presented above tests whether or not governments with vote expectations below 50% change debt policy in election years. First, this assumes that governments who are confident of staying into office are not expected to change debt strategically. This seems reasonable. Second, this also assumes a generalisation of all governments with vote expectations below 50% of who we do expect to change debt strategically. Maybe this assumption is too strict. Indeed, despite vote expectations below 50%, their behavior may be mutually divergent. Especially governments with low vote expectations are expected to engage in strategic debt policy. On the contrary, governments with vote expectations only just below 50% may believe they will be able to attract additional votes necessary to get back into office and will not change debt strategically. Then the question is at what level of vote expectations governments without re-election expectations change debt strategically? We rerun the analyse above with a multitude of PED^{x}_{it} dummies that cover the governments with vote-expectations below x-percent. In fact, in Table 3 we reconstruct PED_{it} to test whether governments with vote expectations below 49% (PED^{49}_{it}), below 48% (PED^{48}_{it}),… etc. change debt strategically.[28] This enables us to test if the strategic debt effect is absent in general or if it kicks in at a lower level of vote expectations.

Some remarks on the presentation of the results of this approach in Table 3. First, in column (1) we present the results when taking PED^{50}_{it} into account as a proxy for the probability of electoral defeat. This corresponds (of course) with the results as presented in Table 2. Second, we do not run regressions for governments with vote expectations below 40% as the Hausman test suggests that random effects are not appropriate anymore below that level.[29] For reasons of comparability we only present random effects results. Third, to provide a general view of the results of these additional analyses in one single table, we only present estimation results of the most efficient regressions (thus leaving out insignificant variables).[30]

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[28] These dummy variable gets value 1 if the forecasted vote percentage (V^{f}_{it}) is below 49%, 48%,… etc. (thus $V^{f}_{it}<x\%$) and 0 otherwise.

[29] Table A4 on p. 31 presents the number of observations for each PED^{x}_{it} operationalisation. The number of observations with $PED^{x}_{it} = 1$ reduces from 195 for PED^{50}_{it} to 32 for PED^{41}_{it}.

[30] When an interaction term is significant, the constitutive variables of the interaction model remains included regardless of whether they are significant. Insignificant constitutive variables are shown in *italic*.

Table 3 Estimation results of the debt change function given different levels of vote expectations, using OLS with random effects

Dependent variable : $\Delta Debt_{it}$	(1) PED^{50}_{it}	(2) PED^{49}_{it}	(3) PED^{48}_{it}	(4) PED^{47}_{it}	(5) PED^{46}_{it}	(6) PED^{45}_{it}	(7) PED^{44}_{it}	(8) PED^{43}_{it}	(9) PED^{42}_{it}	(10) PED^{41}_{it}
Intercept	34.481 ***	20.917 **	20.938 **	21.291 **	21.077 **	20.477 **	21.691 **	21.558 **	21.924 **	20.891 **
	(5.20)	(2.21)	(2.22)	(2.27)	(2.25)	(2.18)	(2.30)	(2.29)	(2.33)	(2.24)
PED^{x}_{it}	-	*11.439*	*16.286*	*15.739*	*18.982*	*16.643*	*4.443*	*7.287*	*3.962*	*16.815*
		(1.21)	*(1.65)*	*(1.48)*	*(1.65)*	*(1.30)*	*(0.32)*	*(0.48)*	*(0.22)*	*(0.86)*
PED^{x}_{it} * $LEFTMAJ_{it}$	-	-59.751 **	-55.567 *	-58.297 *	-61.589 *	-91.759 **	-80.002 **	-82.882 **	-79.329 *	-107.182 **
		(-2.29)	(-1.90)	(-1.88)	(-1.96)	(-2.49)	(-2.04)	(-2.08)	(-1.84)	(-2.34)
$LEFTMAJ_{it}$	-	*6.864*	*2.924*	*1.647*	*1.695*	*1.968*	*-0.320*	*-0.208*	*-1.177*	*-0.703*
		(0.53)	*(0.23)*	*(0.13)*	*(0.14)*	*(0.16)*	*(-0.03)*	*(-0.02)*	*(-0.10)*	*(-0.06)*
$DEBT_{it-1}$	-	0.020 *	0.021 *	0.021 *	0.021 *	0.023 **	0.023 **	0.023 **	0.023 **	0.024 **
		(1.80)	(1.82)	(1.85)	(1.88)	(2.00)	(2.01)	(2.02)	(2.00)	(2.12)
ΔNTI_{it}	-	-	-	-	-	-	-	-	-	-
$\Delta YOUNG_{it}$	3259.128 **	3395.893 **	3198.296 **	3263.821 **	3208.123 **	3295.086 **	3228.155 **	3241.853 **	3162.543 **	3179.011 **
	(2.30)	(2.39)	(2.26)	(2.30)	(2.27)	(2.33)	(2.28)	(2.29)	(2.23)	(2.25)
ΔOLD_{it}	5559.006 **	5203.282 **	5145.907 **	5257.696 **	5325.530 **	5280.077 **	4996.167 **	4997.827 **	5098.493 **	5009.259 **
	(2.20)	(2.06)	(2.04)	(2.08)	(2.11)	(2.09)	(1.97)	(1.97)	(2.02)	(1.99)
$\Delta UNEMPL_{4t}$	-	-	-	-	-	-	-	-	-	-
ΔPOP_{it}	-	-	-	-	-	-	-	-	-	-
$\Delta INTEREST_{it}$	147.184 ***	142.710 ***	134.103 ***	135.964 ***	133.687 ***	137.024 ***	136.111 ***	136.336 ***	133.473 ***	133.343 ***
	(2.89)	(2.76)	(2.60)	(2.64)	(2.59)	(2.66)	(2.64)	(2.64)	(2.59)	(2.59)
$NPAR_{it}$	-	-	-	-	-	-	-	-	-	-
$NPAR^{2}_{it}$	-	-	-	-	-	-	-	-	-	-
Time dummy variable (1994)	-57.034 *	-56.044 *	-52.259 *	-53.145 *	-51.997 *	-52.801 *	-51.980 *	-52.163 *	-51.064 *	-50.92 *
	(-1.88)	(-1.84)	(-1.72)	(-1.75)	(-1.71)	(-1.74)	(-1.71)	(-1.72)	(-1.68)	(-1.68)
R^2	0.043	0.054	0.054	0.053	0.054	0.056	0.053	0.053	0.052	0.055
Adjusted R^2	0.038	0.043	0.042	0.042	0.043	0.045	0.042	0.042	0.041	0.043
Hausman	10.89	11.88	10.99	12.80	11.88	11.09	11.24	11.29	11.39	15.72
	(p=0.54)	(p=0.45)	(p=0.53)	(p=0.38)	(p=0.45)	(p=0.52)	(p=0.50)	(p=0.50)	(p=0.50)	(p=0.20)

Note : N=687; t-values between brackets (except for the Hausman tests where p-values are presented); * significant at 10%, ** significant at 5% and *** significant at 1%.

From Table 3 it is clear that PED^{50}_{it} indeed was chosen arbitrary. The creation of additional dummies for lower vote expectations shows that governments with vote expectations below 49% change debt differently than governments with higher vote expectations. Still this effect cannot be generalised to the PS or AT model. Yet, for all tested operationalisations the PED^{x}_{it} nor the $LEFTMAJ_{it}$ variables are significant, still their interaction terms consequently present significant coefficients and thus strongly suggest that left-wing governments with bad re-election prospects have different slope coefficients. Moreover, the sign of the interaction term is negative, providing evidence that there is a negative impact of leftist governments with vote expectations below the appropriate percentages on the change of debt in election years. This behavior is in line with the PS model, but only for leftist governments not expecting to get into office again. Although it is not linear, the overall trend is that the lower the expected votes, the larger is the impact on debt changes (from 59.75 euros for PED^{49}_{it} to 107.18 euros per capita for PED^{41}_{it}) or thus the stronger the strategic reaction.

If strategic debt policy in line with the PS model is observed for leftist majority governments only, then what can be an explanation for the absence of strategic debt behavior by the other governments? We suggest this could be explained by the consequences of strategic debt behavior on the government's favourite policy if contrary to the expectations the government does return to office. If –as shown in Table 3– a leftist government with bad re-election prospects reduces debt before elections, but unexpectedly stays in office, this debt reduction does not prevent the leftist government to prolong its favourite policy in the next legislature. Indeed, debt reduction before elections creates financial margin to increase expenditures when returning into office. On the contrary, when a rightist government with bad re-election prospects increases debt before elections –as the PS model predicts– it will be confronted with negative consequences of its behavior on its favourite policy if it surprisingly regains majority. Indeed, an increase of the debt not only increases future expenditures –by means of reimbursements of the capital and the interest payments– it also foils the financial margin for tax reductions a rightist government is traditionally in favour of. Therefore, leftist governments are more expected to change debt strategically.

With respect to the control variables, the results are comparable to these in Table 2. $DEBT_{it-1}$ presents a significant positive coefficient indicating a positive effect of the level of debt in the year before elections on debt changes in election years. This positive sign may be another indicator of the "snow ball effect" suggesting that high levels of debt become self-reinforcing.

In a second extension we perform an additional test concerning the role of government fragmentation. As can be seen in Table 2 on p. 19, there is no significant impact of government fragmentation. Still, this does not necessarily mean that fragmentation has no impact at all on strategic debt behavior. It can play a role in strategic debt behavior too by means of a different reaction of a single party government and of a coalition government confronted with the same probability of electoral defeat. As can be seen from the discussion on p. 6 there are opposing expectations about the role of fragmentation on the strategic use of debt. To test these hypotheses, we rerun our regressions separately for single party governments and for coalition governments. Results are presented in Table 4 in columns (1) to (3) for single party governments and columns (4) to (10) for coalition governments. Some remarks on the presentation of the results. First, when focussing on single party governments, $LEFTMAJ_{it}$ and its interaction term with PED^{50}_{it} and PED^{49}_{it} are exact collinear. This indicates that all single party governments with a leftist majority have vote expectations below 49%. Indeed, when examining the dataset, the highest vote expectation of a single party government with a leftist majority is 48.92%. This makes it impossible to run the regressions including the test of strategic debt behavior including PED^{50}_{it} or PED^{49}_{it}. Consequently we present results starting with PED^{48}_{it}. Also for single party governments, results are limited to PED^{38}_{it} as there are no single party governments with a leftist majority that have vote expectations below 37%. Second, we do not run regressions for coalition governments with vote expectations below 43% as the Hausman test suggest that random effects are not appropriate anymore below that level. Again we only present random effects results for reasons of comparability. Finally, as in Table 3 we only present estimation results of the most efficient regressions (thus leaving out insignificant variables).[31]

[31] When an interaction term is significant, the constitutive variables of the interaction model remains included regardless of whether they are significant. Insignificant constitutive variables are shown in *italic*.

Table 4 Estimation results of the debt change function given different levels of vote expectations in single party governments, using OLS with random effects

	Single Party Governments (N= 326)			Coalition governments (N=361)						
Dependent variable : $\Delta Debt_{it}$	(1) PED^{50}_{it} - PED^{49}_{it}	(2) PED^{48}_{it}	(3) $PED^{47}_{it} \rightarrow PED^{38}_{it}$	(4) PED^{50}_{it}	(5) PED^{49}_{it}	(6) PED^{48}_{it}	(7) PED^{47}_{it}	(8) PED^{46}_{it}	(9) PED^{45}_{it}	(10) PED^{44}_{it}
Intercept	-	6.046 (0.39)	17.302 (1.21)	31.591 *** (3.43)	30.123 *** (3.13)	31.268 *** (3.24)	31.540 *** (3.28)	33.299 *** (3.65)	32.674 *** (3.42)	33.600 *** (3.51)
PED^{x}_{it}	-	*10.559* *(0.86)*	-	-	*24.243* *(1.35)*	33.638 * (1.76)	*33.872* *(1.59)*	-	*22.706* *(0.874)*	*3.791* *(0.13)*
PED^{x}_{it} * $LEFTMAJ_{it}$	-	-241.10 ** (-2.24)	-	-	-97.284 *** (-2.82)	-73.095 * (-1.74)	-83.422 * (-1.85)	-	-180.921 *** (-2.92)	-220.397 *** (-2.94)
$LEFTMAJ_{it}$	-	207.844 ** (2.06)	-	-	*6.450* *(0.47)*	*-0.490* *(-0.04)*	*-1.346* *(-0.10)*	-	*-0.836* *(-0.06)*	*-2.705* *(-0.21)*
$DEBT_{it-1}$	-	0.031 * (1.70)	0.033 * (1.83)	-	-	-	-	-	-	-
ΔNTI_{it}	-	97.222 * (1.71)	-	-	-	-	-	-	-	-
$\Delta YOUNG_{it}$	-	-	-	3421.232 * (1.95)	3773.462 ** (2.14)	3396.354 * (1.93)	3494.555 ** (1.99)	-	3736.464 ** (2.12)	3750.392 ** (2.13)
ΔOLD_{it}	-	5777.578 * (1.92)	-	-	-	-	-	-	-	-
$\Delta UNEMPL_{it}$	-	-	-	-	-	-	-	-	-	-
ΔPOP_{it}	-	-	-	-	-	-	-	0.005 * (1.78)	-	-
$\Delta INTEREST_{it}$	-	-	-	186.661 *** (2.89)	199.164 ** (3.07)	182.914 *** (2.82)	187.220 *** (2.90)	62.250 *** (4.35)	196.455 *** (3.03)	198.506 *** (3.07)
Time dummy variable (1994)	-	38.852 *** (3.12)	-	-75.590 ** (-2.02)	-82.578 ** (-2.21)	-75.962 ** (-2.02)	-77.181 ** (-2.06)	-	-81.319 ** (-2.17)	-83.803 ** (-2.24)
R^2	-	0.086	-	0.060	0.080	0.071	0.070	0.057	0.082	0.085
Adjusted R^2	-	0.066	-	0.052	0.065	0.055	0.055	0.052	0.066	0.070
Hausman	-	-[32]	10.922 (p=0.45)	11.70 (p=0.39)	12.07 (p=0.36)	11.36 (p=0.41)	16.73 (p=0.12)	16.66 (p=0.11)	13.68 (p=0.25)	17.26 (p=0.10)

Note : N=687; t-values between brackets (except for the Hausman tests where p-values are presented); * significant at 10%, ** significant at 5% and *** significant at 1%.

[32] Hausman test is set to zero as cross-section test variance is invalid.

When reviewing the results for single party governments and for coalition governments, we may confirm the idea put forward by Ashworth *et al.* (2006) that parties in a coalition are on average less certain of future power. This may lead them to be more sensitive to the strategic use of debt. Indeed, the results in Table 4 confirm that strategic use of debt is particularly observed by coalition governments.[33] For single party governments, there is no evidence of strategic use of debt when vote expectations are below 47%. These findings are opposite to those for coalition governments. In general the estimations in Table 4 provide evidence of strategic use of debt in coalition governments when vote expectations are below 49%.[34] Except for the PED^{48}_{it} estimation we again only find leftist majority coalition governments to change pre-electoral debt. Comparing the findings for coalition governments in Table 4 with the results from Table 3, absolute values of the interaction term's (PED^{x}_{it} * $LEFTMAJ_{it}$) coefficients are increased, suggesting stronger effects on the change of debt for coalition governments. We thus can conclude that strategic debt behavior is a phenomenon that can be observed especially in fragmented government scenarios. This may be due to the fact that as well as the electoral results, the ensuing coalition negotiations play a role in whether or not the government can continue with the same coalition partners as in the previous term.

6. Conclusion

This paper discusses the literature on strategic use of debt models and empirically tests them on a dataset of Flemish municipalities. In general the literature on strategic debt models shows that the evidence is mixed and we suggest that the lack of an undisputed measure to estimate the probability of electoral defeat obstructs the formulation of a general consensus on this matter. Most of these measures are based on historical political stability information, which ignores the fact that incumbents have to try to estimate what voters have in mind in the voting booth when estimating the government's probability of electoral defeat. As Baleiras (1997; 202) explicitly states "this probability depends on the electorate's assessment of the incumbent's performance while in office". They thus consider not only historical, but also tax, economic and political variables. Therefore we introduce vote functions to estimate the prospects of electoral defeat. For the purpose of this paper the vote function of Vermeir & Heyndels (2006) is used to construct a good proxy for the prospects of electoral defeat. Our main results show that the strategic use of debt in Flemish municipalities cannot be undisputedly confirmed. First, strategic debt cannot be stated for all governments with vote expectations below 50%. Still it can be observed for governments with expected vote percentages below 49%. Second, strategic debt changes can only be stated for leftist governments without re-election prospects, while the

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[33] The absence of significant coefficients for PED^{x}_{it}, $LEFTMAJ_{it}$ and their interaction terms result in the same estimation results for each PED^{x}_{it} estimation when lowering the vote expectations below 47%. Therefore the results presented in column (3) count for each level of vote expectations below 47%.

[34] Remark that this is not true for the PED^{46}_{it} estimation. We do not have an idea why the interaction term loses significance at the 46-level, while it regains significance at lower levels of vote expectations.

seminal models also formulate expectations about governments with opposing ideological characteristics. It thus seems that in Flemish municipalities leftist majority governments without re-election prospects are sensitive to strategic debt behavior, while this is not true for its ideological counterparts. Probably the consequences of debt changes on its own policy when a government surprisingly returns to office could explain these findings. Third, our analyses show that strategic debt behavior is more to be expected in the case of coalition governments. When running separate analyses for single party governments and for coalition governments, we find only significant strategic debt coefficients for the latter. This may be due to the fact that coalition governments have both to win the elections and also to survive the ensuing coalition negotiations. This increases their uncertainty of returning to office and as a consequence their motivation to strategically issue debt.

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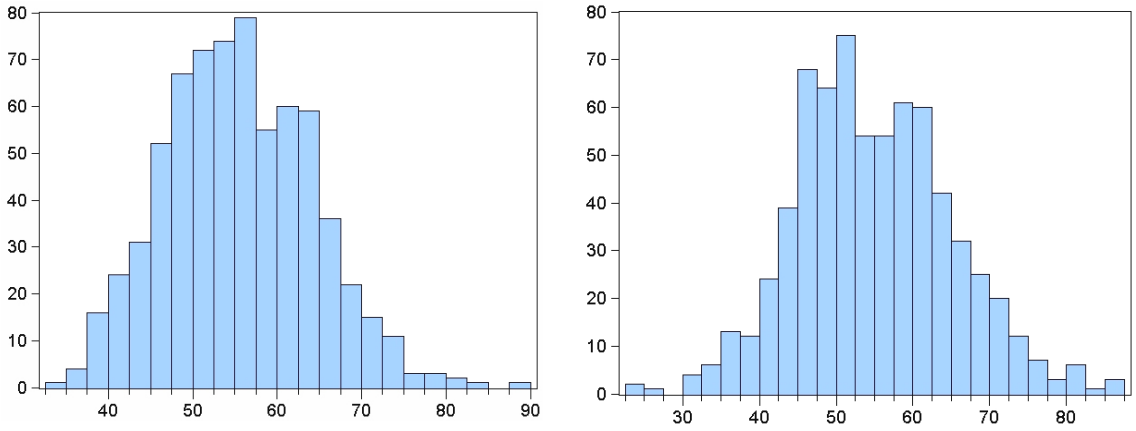
Appendices

Table A1 Descriptive statistics of the variables in the vote function (N=688) and data sources

	Mean	Median	Max	Min	Std.dev.	Source
Dep. Var. : Vote share (in %) government parties (V_{it})	54.93	54.05	87.30	24.15	10.18	MICE, VUB[35]
Vote share (in%) current government parties at t-6 (V_{it-6})	56.24	55.08	88.29	37.25	8.32	MICE, VUB
Local income tax rate ($LITR_{it}$)	6.53	6.50	9.00	0.00	0.89	VVSG[36]
Local property tax rate ($LPTR_{it}$)	959.61	950.00	2000.00	170.00	264.79	VVSG
Per capita expenditures (in €1000) (EXP_{it})	0.67	0.62	2.18	0.23	0.25	MICE, VUB
Average local income tax rate of neighbouring municipalities ($LITRN_{it}$)	6.58	6.57	8.00	3.00	0.51	VVSG, matrix of MICE, VUB
Average local property tax rate of neighbouring municipalities ($LPTRN_{it}$)	975.77	969.08	1650.00	400.00	191.66	VVSG, matrix of MICE, VUB
Average per capita expenditures of neighbouring municipalities (in €1000) ($NEXP_{it}$)	0.69	0.67	1.82	0.42	0.17	VVSG, matrix of MICE, VUB
Per capita net taxable income (in €1000) (NTI_{it})	5.49	5.45	8.88	3.21	0.96	MICE, VUB
Unemployment rate ($UNEMPL_{it}$)	0.03	0.02	0.08	0.01	0.01	CORE, UCL
Numbers of parties in the government ($NPAR_{it}$)	1.63	2.00	5.00	1.00	0.87	MICE, VUB

Table A2 Descriptive statistics and histograms of forecasted votes (left histogram) and ex-post vote results (right histogram) (N=688)

	Forecasted votes (V^f_{it})	Ex-post votes (V_{it})
Mean	55.44	54.93
Median	55.08	54.05
Maximum	88.46	87.30
Minimum	34.04	24.15
Std. Dev.	8.71	10.18
Correlation	0.62	



[35] MICE (Micro-Economics for Profit and Non Profit Sector) research team of the Faculty of Economic, Social and Political Sciences, and Solvay Business School, Vrije Universiteit Brussel.

[36] "Vereniging Vlaamse Steden en Gemeenten", the Association of Flemish Cities and Municipalities.

Table A3 Descriptive statistics of the variables in the strategic debt estimation (N=688) and data sources

	Mean	Median	Max.	Min.	Std.dev.	Source
Dep. Var. : Change of debt per capita ($\Delta DEBT_{it}$)	61.71	40.03	696.69	-446.52	99.27	MICE, VUB
Prospects of electoral defeat (PED_{it})	0.28	0.00	1.00	0.00	0.45	Own calcul.
Left majority ($LEFTMAJ_{it}$)	0.13	0.00	1.00	0.00	0.33	Own calcul. on MICE, VUB
$PED_{it} * LEFTMAJ_{it}$	0.04	0.00	1.00	0.00	0.19	-
Debt (p/c) ($Debt_{it-1}$)	766.93	685.89	3829.52	120.57	373.96	MICE, VUB
Change of net taxable income (p/c) (ΔNTI_{it})	0.07	0.07	0.65	-0.70	0.10	FPS Economy
Change of proportion of elderly (ΔOLD_{it})	0.00	0.00	0.01	-0.01	0.00	FPS Economy
Change of proportion of young ($\Delta YOUNG_{it}$)	-0.01	0.00	0.01	-0.04	0.01	FPS Economy
Change of unemployment rate ($\Delta UNEMPL_{it}$)	0.00	0.00	0.05	-0.09	0.01	FPS Economy
Change of number of inhabitants (ΔPOP_{it})	-22.06	1.00	18760.00	-16592.00	1822.24	FPS Economy
Change of real interest rate on long-term (federal) government bonds ($\Delta INTEREST_{it}$)	0.47	0.63	0.77	0.02	0.33	MICE, VUB
Actual number of government parties ($NPAR_{it}$)	1.63	2.00	5.00	1.00	0.68	MICE, VUB

Table A4 Number of governments with vote expectations below x percent

V^f_{it}<	35%	36%	37%	38%	39%	40%	41%	42%	43%	44%	45%	46%	47%	48%	49%	50%
N	1	3	5	7	17	21	32	39	52	62	76	99	118	143	164	195