

Political Competition and Local Government Performance: Evidence from Flemish Municipalities

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Abstract

The argument has recently been made that political competition may have a similarly virtuous effect on economic performance as market competition. The present paper provides a further empirical assessment of this proposition by looking at local level governments in Flanders. The results indicate that political competition at elections does have a beneficial effect on the efficiency of municipality performance. However, these beneficial effects are mitigated somewhat in that such competition may lead to fragmented governments and there is some evidence that such fragmentation works against efficiency. Overall, though, the beneficial effects outweigh the negative and the conclusion is that competition is a force for efficiency in Flanders.

Introduction

One of the things we teach in undergraduate micro-economics courses is that the absence of economic competition leads to excessive prices and restrained supply levels. Consumer welfare thus is severely reduced by the rent extraction of monopolists. However, whether a similar effect also holds in political markets – that is, lack of competition leading to excessive rent extraction by politicians – receives much less attention. This does not imply that there has been no attention for the effects of political competition on policy outcomes. At least since Key (1949), and especially in the United States, the political science literature has been very active in assessing the idea that inter-party competition “is healthy and likely to lead to more representative public decisions” (Gilligan and Matsusaka, 1995, 393). This work, however, focuses exclusively on the type of policies pursued (e.g. whether or not these are more liberal under competitive environments) and does not analyse whether political competition leads to greater or lesser government efficiency or rent extraction.

Despite this literature and the work of Stigler (1972), arguments that political and economic competition have analogous effects in terms of rent extraction and inefficient provision of (public) goods are mostly of a much more recent origin (e.g. Becker, 1983; Wittman, 1989, 1995). Nonetheless, a consensus appears to be emerging on the view that there might be significant similarities between economic and political competition and that “competition for political office reduces the potential for opportunism by politicians” (Wittman, 1989, 1396). More formal analyses by Polo (1998), Svensson (1998) and Besley *et al.* (2005) likewise indicate that the absence of political competition – defined as the presence of an electoral bias in favour of one party or the absence of a large pool of non-committed voters that could ‘swing’ the election result – might cause excessive rent-seeking or inefficient provision of public goods by the government.¹ The reason for this effect is that a large electoral advantage (or, more generally, lack of political competitors) is likely to moderate the extent in which politicians are held accountable for their actions at election time – thus allowing them to serve narrow economic (or selfish) interests without jeopardizing their re-election odds.

Indirect empirical evidence tends to support the ensuing hypothesis that political competition decreases rent extraction and/or government inefficiency. Svensson (1998), for example, shows that health spending leads to a lower drop in infant mortality rates in highly polarized (politically less competitive) countries and that overall government spending significantly negatively affects economic growth only in these countries (while having no significant effect in competitive countries). Besley *et al.* (2005) find more competition to be positively related with personal income growth in the US states. The present paper aims to provide more direct evidence that political competition decreases rent extraction and government inefficiency by assessing Flemish local government efficiency ratings. High (low) efficiency indicates that the government generates high (low) levels of public goods with limited (high) spending. As such, it reveals how effective the local government is in translating public spending into public goods – or, reversely, how strongly it indulges in rent-seeking or inefficient behaviour. The results – using data from 308 Flemish municipal governments in the year 2000 – corroborate the hypothesis that higher competition reduces inefficiency.

¹ Importantly, however, Polo (1998) also finds that, when candidates cannot commit to electoral promises, rent extraction first decreases with the number of parties (an alternative indicator of political competition) but starts to increase once this number surpasses a certain, though undefined, threshold.

The remainder of the paper is organised as follows. Section 1 discusses the prior literature regarding the effects of political competition on policy outcomes. Specific attention is given to recent theoretical extensions that specifically regard the similarities between economic and political competition, arguing that both types of competition may similarly affect the extent of rent-seeking behaviour (by firms and incumbents respectively). Section 2 gives some background information on the Flemish local institutional setting and describes the indices of political competition which are used in the empirical analysis. The results of the empirical analysis are in section 3. Section 4 concludes.

1. Theoretical framework and previous literature

In economics, it is generally accepted that competition in the private sector improves consumer welfare. Specifically, compared to a monopoly situation, prices are lower and quantities provided are higher under perfect competition, leading to a larger consumer surplus in the latter situation. The reason is that the rivalry between alternative producers for a share of the market induces them to set prices and quantities such that all profits (or monopoly rents) dissipate. This virtuous effect of 'economic' competition in the private market led to the appeal for increased 'economic' competition in public service provision. Indeed, so the argument goes, "the counterparts of oligopoly and monopoly distort prices and outputs in the public as well as in the private sectors" (McKean, 1965, 502). Hence, an increase in competition, for example allowing private schools or hospitals to compete with public ones, should lead to better service provision as indicated by higher quantity and/or quality, lower prices and so on. This demand for increased economic competition in public services was very dominant in public management discussions in the 1980's and 1990's and also received substantial attention in the scientific literature at that point in time. The general tenor of empirical analyses is, however, at best only weakly supportive of competition's virtuous effects in the public sector. Reviewing the results of 18 studies on public service performance where a measure of competition is included (i.e. number of suppliers, distribution of market shares or manager's perception of the intensity of competition), Boyne (2003) indicates that only seven analyses provide unequivocal support for a positive effect of higher competition. Four studies refute the theory and the remainder provide mixed (or insignificant) estimation results. Mueller (2003), however, provides more encouraging results regarding the benefits of economic competition in a review of 71 studies. Indeed, he finds that only 5 studies show that public provision outperforms private provision while the reverse is true in 56 studies (the remainder not showing significant differences).

This study takes a different approach to competition in the public sector. Rather than regarding the effect of 'economic' competition on public goods and services providers, the present paper concentrates on the effect of 'political' (or electoral) competition on the incumbent's policy decisions. The underlying idea is that the extent of political competition between politicians (or parties) affects the decisions of those politicians (or parties) currently in power. The reason is that an incumbent's re-election odds provide a harsher constraint on policy decisions when competition is higher than when (s)he has a large electoral advantage. There is, in other words, "a more credible threat of removal from office" when political competition is high (Skilling and Zeckhauser, 2002, 127). This more pressing electoral constraint is expected to affect policy choices.

This idea is not new. In fact, the policy consequences of political competition have been extensively discussed both in political science and public choice. Two main foci can be identified. First, some authors have investigated the effects of political competition on the size

of government. Second, attention has been given to the impact on the efficiency of public goods provision.

- *Political competition and size of government*

The seminal contribution of Key (1949, 307) built on an analysis of the United States to point out that where competition is high “anxiety over the next election pushes political leaders into serving the interests of the have-less elements of society”. The reason is that low-income individuals generally have a lower tendency to vote, such that their demands are likely to be undersupplied in non-competitive political situations (where the incumbent does not need to attract these voters by catering policies to their needs). A competitive political environment, however, leads incumbents to focus attention more on these weaker groups in the population as they could ‘swing’ the election in the incumbent’s favour. This would lead to higher welfare spending (or more liberal policies in general) when competitive pressures in the political sphere increase. A more general treatment of Key’s (1949) ideas, however, would imply that vote-maximizing incumbents may be drawn to promote policies that accommodate particular interest groups, not just the have-nots in society (e.g. Mueller and Murrell, 1986). Hence, *any* policy proposal might be propagated to attract a certain interest group and attain electoral success. Nonetheless, even when such accommodation to interest groups increase with political competition (cfr. Lizzeri and Persico, 2002), it is not clear that this would necessarily lead to a larger public sector overall. Indeed, while certain interest groups might be won by an increase in spending, others may be more pleased with a decrease in taxation. The size of the public sector – and, by extension, spending on any category of the budget – thus need not necessarily increase with higher levels of political competition (Rogers and Rogers, 2000).

Another argument holds that ‘fiscal illusion’ – the systematic misperception by citizens of the real costs and benefits of policy programs – not only leads to a larger government (cfr. Buchanan and Wagner, 1977), but will in general also be higher when political competition is lower (West and Winer, 1980). Hence, the hypothesis here would be that competition decreases the size of the public sector by lowering the use of complex and indirect tax structures to finance public spending. Still, one might also argue that incumbents may wish to resort to such complex tax structures more when competition is higher (as they provide a clear electoral benefit for them), leading to a larger government sector when competition is higher.

In summary, both the interest group and the fiscal illusion arguments lead to ambiguous empirical implications. These theoretical ambiguities with respect to the effect of political competition on the size of the public sector – and different spending categories within this budget – can only be solved by empirical work. The existing evidence, however, does not provide a clear consensus. While some scholars find that political competition increases spending in certain categories through special interest politics (e.g. Dye, 1984; Holbrook and Van Dunk, 1993, Costa-I-Font *et al.*, 2003), others find that greater political competition “acts as a check against bigger government” in general (Rogers and Rogers, 2000, 1; see also Skilling and Zeckhauser, 2002).² Interestingly, a recent comparison of public service provision in

² Note that measures of political competition in the literature have been based on election results, the seat division in parliament (or government), the number of parties in an election (or obtaining representation in parliament or government), the time a given party (or political bloc) controls the government and so on. Though we return to this measurement issue later on, we point out here that these differences in approach are unlikely to be of trivial importance for the interpretation of the estimation results. Measuring political competition based on the seat division in a coalition government may, for example, not only indicate the level of competition in the party system, but

democracies and non-democracies by Mulligan *et al.* (2004) shows that overall spending on public goods provision is not significantly lower in non-democracies (where political competition is arguably lower than in democratic regimes) compared to democracies. Still, the results indicate that they do have significantly higher levels of those public goods that are important in “winning and maintaining public office” (such as military spending) (Mulligan *et al.*, 2004, 52).

- *Political competition and government efficiency*

More recent theoretical contributions focus their attention not so much on the effects of increased political competition on the size of the public sector (or of specific spending categories), but rather on the efficiency of public goods provision by the government. Specifically, it is argued that more stringent political competition between parties (or politicians) may lead to a reduction in rent extraction and inefficient provision of public goods – much like economic competition in the private market reduces monopoly rents. Or, to frame the issue more negatively, when political competition is low, “the state will exercise its monopoly power, provide fewer public services, and earn greater rents” (Lake and Baum, 2001, 590). This approach thus provides a more direct comparison between the effects of political competition on public policy decisions and of economic competition in the private market (early contributions are e.g. Stigler, 1972; Becker, 1983; Wittman, 1989, 1995). The underlying idea is that severe competition for political office reduces the ability of politicians to engage in opportunistic behaviour – in the form of rent extraction or inefficient behaviour. Such behaviour could in a competitive environment prove too costly because it negatively affects the probability of being re-elected (or, for parties, negatively affects the expected seat share or the probability of obtaining a majority position). Reversely, a large electoral advantage or a lack of (significant) political competitors is likely to decrease the electoral accountability of politicians – allowing for higher rent extraction. “Simply put, in the absence of competition, accountability suffers” (Holbrook and Van Dunk, 1993, 960) and incumbents have the possibility to extract (higher) rents without jeopardizing their re-election odds.

Formal analyses likewise support the proposition that “candidate’s competition for office might induce a dissipation of political rents” (Polo, 1998, 3; see also Svensson, 1998; Besley *et al.*, 2005). A lack of political competition is thereby modelled as a bias in the number of committed voters in favour of one party or project (e.g. Polo, 1998; Besley *et al.*, 2005; see also Grossman and Helpman, 1996 and Wilson and Damania, 2005 for a similar modelling of competition in a different context) or the absence of a pool of non-committed voters that could ‘swing’ the election outcome (e.g. Svensson, 1998). Importantly, however, a caveat may be in order as Persico and Lizzeri (2002) show that defining competition through the number of parties in the system may lead to increases in the accommodation of special interest groups (and thus less efficient policies) with the extent of political competition. Also, Polo (1998) finds that when candidates cannot commit to their proposed platform rent extraction first decreases with the number of parties, but may then increase again.

also captures possible gridlock effects deriving from multi-party governments (e.g. Roubini and Sachs, 1989; Ashworth *et al.*, 2005). Moreover, and especially in majoritarian electoral systems, seats in parliament can be captured with a narrow electoral lead. If the same party obtains all seats in the parliament with a such a narrow lead, electoral competition is high while a measure of competition based on seat divisions indicates total absence of competition (see also Rogers and Rogers, 2000).

To the best of our knowledge, empirical evidence on the effect of political competition on government efficiency and rent extraction is scant and of an indirect nature. Svensson (1998), for example, presents evidence that the effectiveness of government spending in attaining given desired outcomes is reduced when political competition decreases. Specifically, his results indicate that the reductive effect of health spending on infant mortality is lower – and the growth-reducing effect of overall government spending higher – in highly polarized (or politically less competitive) countries. In similar vein, Besley *et al.* (2005) find that the increase in political competition in the American South since the abolition of literacy tests and poll taxes is significantly positively related with personal income growth and governor quality. These results are driven by lower taxation levels and the introduction of certain pro-growth policies (such as the introduction of Right to Work laws) in politically competitive environments. While these findings appear to support the idea that political competition affects government efficiency, the evidence is not conclusive. For one, even though political competition in democracies is arguably higher than in authoritarian regimes, the former do not consistently outperform the latter in terms of economic growth (for a review, see Przeworski and Limongi, 1993).³ Moreover, the presented evidence, as mentioned, remains indirect as higher levels of rent extraction (or lower government efficiency) under non-competitive environments are inferred from variations in economic outcomes (and not by assessing explicitly the incumbent's inefficiency or rent extraction). To accommodate this, the central research question in our empirical analysis will be whether more stringent political competition between parties (or politicians) reduces rent extraction and inefficient provision of (public) goods by incumbents.

2. Institutional setting and measurement of political competition

Municipal governments constitute the lowest level of government in Flanders – and, by extension, in Belgium (next to the national, regional and provincial levels). Nonetheless, they have considerable autonomy to pursue their own policies. In fact, as long as the initiatives they propose are not prohibited explicitly by federal legislation (e.g. because they are beyond the responsibilities outlined for municipalities), local governments can initiate any policy that promotes the interests of their constituents and independently determine how they finance these policies. Consequently, the local level of government assumes significant responsibilities in education, local infrastructure, public safety, welfare, ... This significant autonomy also shows from the strong variation in the structure of revenues across the Flemish local governments. Indeed, while surcharge taxes on the regional property tax (i.e. the local property tax, LPT) and the federal personal income tax (i.e. the local income tax, LIT) generate on average 83 percent of total tax income (data for the fiscal year 2000), the rates for these two revenue sources vary strongly. The lowest and highest LIT rates (also in the year 2000) were 0% and 8.5% of federal tax receipts respectively, while LPT rates varied between 438% and 2000% of the regional tax.⁴ Moreover, local government often resort to 'local' taxes for which they can determine both the tax base as well as the tax rate (for the surcharge taxes mentioned above they only set the tax rate). Actually, the average Flemish municipality collects about 15 different 'local' taxes (currently, more than 100 different local taxes are in use).

³ Pinto and Timmons (2005) recently argued that this lack of consensus may derive from the fact that political competition has cross-cutting effects on the sources of growth – increasing productivity and human capital accumulation, but decreasing factor mobilization (of both labour and capital).

⁴ Inhabitants thus pay a supplement of 5 to 20 times their regional government property tax bill (and 0-8.5 percent of their federal personal income tax bill) to the local government. The major part of income taxation thus flows to the federal government while local governments collect the main part of property taxation in Flanders.

Local governments in Flanders consist of the College of Mayor and Alderman (the executive body) and the local council (the legislative body). Councillors are chosen via municipal elections that take place once every six years (there are no term limits). Following the election, the party or coalition of parties that controls a majority of the seats in the council decides on the composition of the executive board. The political system in the Flemish municipalities can thus be characterized as a parliamentary system where the executive board is formed by a political majority.

There are several characteristics in the Belgian local institutional setting that allow for high levels of political competition. Firstly, given certain eligibility requirements (e.g. no criminal convictions), all inhabitants of the municipality above age 18 can stand for election on the local council. Presenting a list in the municipal elections is, moreover, fairly easy. It only requires presentation of the proposed list four weeks prior to the elections accompanied by a limited number of signatures (of individuals eligible to vote in the municipality) in support of the candidacies. This number of signature depends on the size of the municipality and varies between 5 and 100. The party's list should contain at least one candidate with a maximum equal to the number of seats to be allocated. This low barrier to entry allows for active political competition on the local level. Secondly, the elections take place using a system of Proportional Representation (i.e. highest average Imperiali – without legal thresholds). In such systems, even small parties have a relatively large probability of gaining representation. Given that voters do not want to 'waste' their votes on parties that are highly unlikely to obtain a seat and party elites will not want to waste resources on election campaigns if they do not have a realistic chance of gaining representation, this low threshold of representation will have a positive effect on party's willingness to enter the political arena.

[Explanation and data concerning indices of political competition – to be added]

3. Empirical analysis - PRELIMINARY RESULTS!!

3.1 Model and hypotheses

In order to consider the issues raised above, a cross-section snapshot of activities of local municipalities in Flanders is examined for the year 2000. There are 308 municipalities in Flanders with a large variation in but all with the same powers to enact policies thus providing a wide spectrum in order to examine possible efficiency.

In very basic terms, the estimation will be

$$\text{EFFICIENCY}_i = b_0 + b_1 \text{CONTROL}_i + b_2 \text{COMPETITION}_i + u_i$$

Where EFFICIENCY is a measure of how well the municipality is performing; CONTROL is a vector of control variables to account for non-competition elements that may affect efficiency within the municipality and COMPETITION is a vector of variables reflecting different aspects of political competition within the municipality. Subscript i indicates the ith municipality and u_i determines the error term.

Firstly, it is necessary to clearly define a measure of the efficiency of government. Efficient governments can be defined as those that need only few resources to generate a high level of public goods provision while inefficient governments are characterized by using a high level of

resources to generate moderate or low levels of public goods. Government efficiency thus indicates how effective the incumbent government is in turning public expenditures into public goods – or, reversely, how strongly it indulges in rent-seeking behaviour. Consequently, our measure of the efficiency level of Flemish local governments relates their total expenditures (i.e. the inputs used) to their provision of public goods (i.e. the outputs produced). Several methods have been brought forward in the literature to estimate this relation between inputs and outputs (for an excellent introduction, see Lovell, 1993). All these methods for estimating efficiency have, however, two things in common. Firstly, each approach starts out by generating a ‘best practice frontier’, which contains the input-output combinations designating optimal or efficient behaviour. Then, as a second step, deviations from this frontier are used to determine the extent of inefficiency of combinations not on this best practice frontier. Still, despite the fact that these two basic steps are common to all approaches, differences occur in both the determination of the best practice frontier (either parametric or non-parametric) and in how to regard deviations from that frontier (either deterministic or stochastic). While these differences in the approach used imply that the exact efficiency ratings obtained through the various approaches will necessarily differ, the results are (generally) highly correlated (De Borger and Kerstens, 1996).

In the present analysis, we employ a non-parametric approach to obtain the efficiency ratings, viz. Data Envelopment Analysis (assuming variable returns to scale) developed by Farrell (1957). In this approach, the best practice frontier is generated as a piecewise linear envelopment of the data (imposing that the production possibilities set is convex) and any deviation from the best practice frontier is interpreted as inefficiency (De Borger and Kerstens, 2000).⁵ Our input variable equals total expenditures in the municipality in the fiscal year 2000 for the 308 Flemish municipalities. Our output variables relate to the level of local public goods provision in sectors where local governments in Flanders assume the prime responsibility (e.g. education and social and recreational services). They include: (a) the number of subsistence grants beneficiaries, (b) the number of students in local primary schools, (c) the share of inhabitants older than 65, (d) the total population and (e) the surface of public recreational facilities (measured in hectare). Though the same output variables have been used in previous work on government efficiency in Flemish (and Belgian) municipalities (see Vanden Eeckaut *et al.*, 1993; De Borger *et al.*, 1994; De Borger and Kerstens, 1996), these are obviously not ideal. For example, the number of subsistence grants beneficiaries and total population are rather crude proxies for the services rendered to low-income families and the administrative tasks of the local government respectively (De Borger *et al.*, 1994; De Borger and Kerstens, 1996). Unfortunately, however, better measures are not available.⁶ This, regrettably, reflects the general problem with defining and measuring public sector inputs and outputs (cfr. Levitt and

⁵ Given the existence of measurement error and other stochastic influences, it may not be appropriate to designate all deviation from the frontier as inefficiency (Aigner *et al.*, 1977; Meeusen and van den Broeck, 1977). However, in this case, various approaches to such a measure, Free Disposal Hull, Data Envelopment Analysis assuming constant returns to scale and both a deterministic and stochastic parametric frontier approach are all highly correlated ($r > 0.75$) and so the choice was determined by the measure that gave the best fit.

⁶ Information on variation in the quality of the output variables was not available.

Joyce, 1987; De Borger and Kerstens, 1996).⁷ Higher values point to more efficient municipalities with a limit at unity for municipalities on the efficiency hull.⁸

Turning to the other variables, there are clearly questions which relate to activities of the municipality which might impinge on its efficiency. A number of variables are considered to capture this. Firstly, we include income per capita in the municipality (INCOME). The wealth of residents may be very important if there is some aspect of provision which requires that efficiency of provision entails a significant investment of resources. For example, the use of up-to-date techniques which enable efficiency may be limited by the wealth of the community (and its inhabitants). Further, the rich may be more effective in demanding greater efficiency (Knack, 2002). On the other hand, it is possible that having a rich municipality means that it is easier to raise revenue and so there are fewer requirements to be efficient (only relatively efficient to reference authorities). In addition to income, income distribution (INCDIST) may also affect municipalities' ability to be efficient. Indeed, in other work, Ashworth *et al.* (2003), there is some evidence that from a budgetary viewpoint, income (in)equality may be a good thing. For example, given the progressive nature of the tax system, notably of the local income tax, the total tax revenues in a municipality will – at any given average income level - be larger to the extent that the income distribution is more unequal. As with income, whether this translates into efficiency is an empirical matter. Income inequality is measured by the ratio of the interquartile difference in income to the median value.

Allied to this is the tax revenue (TAXREV) that is raised. Whilst the majority of tax revenues derives from local income and property taxes (see *supra*) and thus pertains to income levels in the municipality, there remains scope for raising other revenue (see Ashworth *et al.*, 2006 for an example). However, it is an empirical issue as to whether extra resources are efficiently used. Allied to the tax revenue is the grant system in place. If, for example, part of the grants provided by higher-level governments (GRANTS) is used to equalise the resources available to authorities, this may alleviate some of the problems for poor authorities. It is, however, not completely clear that this will necessarily generate higher efficiency. This would indeed necessitate that the grant-givers are clear on the nature of the municipalities' production function.

Past behaviour by the municipality may also affect its ability to be efficient in any given time period. For example, if a municipality has some debt (per capita, DEBT) carried over from the past, this may limit its ability to be efficient in a given year. Nevertheless, it may also be that the municipality gets the benefits of the investments without needing to resort to additional spending in the current time period and so is (apparently) more efficient in the given period.⁹ Any of these arguments can be reversed for (current account) surpluses (SURPLUS). Still, as there is no guarantee that debt and surplus will have identical effects (in terms of size) on efficiency and as there may be asymmetric effects, the two variables must be examined

⁷ Though panel data might resolve some of the problems related to these measurement issues, time series data were not available for various output variables. Merging our efficiency ratings with those generated by previous Belgian studies was also unfeasible. Indeed, this previous work regarded either all Belgian or only the Walloon municipalities, while our data are restricted to the Flemish municipalities.

⁸ The data are calculated using the EMS-program (version 1.3.0) by Hodger Scheel (University of Dortmund).

⁹ Flemish municipalities are in principle only allowed to generate debt through financing long-term capital investment projects (e.g. on infrastructure). For more details on the rules, see Ashworth *et al.* (2005). There is a case for considering debt relative to income; the use of such a variable was less significant than the per capita variable and so the results presented use this variable.

separately. Finally, population (POP) may also be a relevant factor and in particular population density (POPDEN) as some services may be easier to provide if the population is larger or more heavily concentrated. For example, the elderly in isolated communities may be more difficult to service. Against this, a number of social problems that are associated with urban centres may make achieving efficiency more difficult.¹⁰

Turning to the possible effect of political competition, there are two strands that need to be examined here: competition within government and competition at the election. The first is captured under the Weak Government Hypothesis and has been explored in a number of different guises (see Roubini and Sachs, 1989; Alesina and Drazen, 2001; Tsebelis, 1995; Volkerink and de Haan, 2001). As the authors have shown in a number of previous papers (e.g. Ashworth *et al.*, 2005, 2006; Coffé and Geys, 2005; Goeminne *et al.*, 2005), fragmentation of the government tends to have a significant impact on local government's decision-making in Flanders such that it is likely also to impinge on the ability of governments to be efficient.¹¹ Single party governments (SOLE) will not suffer from a gridlock of decision-making but they may not have a desire to produce in the most efficient manner (monopoly power allowing for higher rent extraction). Clearly, from the above, the number of parties in the governing coalition (NUMCOAL) may prove to be important. In addition, the make-up of the parliament (NUMPARL) may be important as it may reflect the degrees of potential future electoral political competition given that the nature of the opposition may determine the effective opposition. Allied to this, the size of the majority of the ruling party / parties (EXCESS) in terms of the spare number of seats that the ruling coalition has over the (combined) opposition may be relevant as even in a coalition, it may free a government to take decisions.

Finally, as a political control variable, we include IDEO which measures the ideology of the incumbents (from left to right). It is generally assumed that left-wing governments favour larger public sector provision and the question arises as to whether this size increase is efficient.

The second strand – examining the extent to which ex ante competition (as opposed to the ex post definition of the previous paragraph) is a driver for government efficiency – is the primary thrust of the research of this paper. Two variables are used to capture and investigate this possibility. The first is a direct measure of competition, viz. the number of parties contesting the election (PAREL). The second considers political volatility (POLVOL) in terms of the change in seat shares obtained by parties over time. Following Pedersen (1979), this is measured as:

$$\text{POLVOL} = \sum_{i=1}^n |p_{i,t} - p_{i,t-1}|$$

¹⁰ Clearly, a number of the variables suggested are liable to be collinear with each other. However, our vector of control variables is determined in large part by the findings in previous studies of government efficiency (e.g. De Borger *et al.*, 1994; Grossman *et al.*, 1999 and De Borger and Kerstens, 2000 for a review). It should be noted that there is a case for not using population as this has been used to create the efficiency measure and there may be an element of a double-count. For this reason, results are given which include and exclude population. As can be seen, there is only a minor effect on the main conclusions.

¹¹ As these and other papers have shown, there are a number of ways in which the Weak Government Hypothesis may manifest itself. In this paper, simple measures of fragmentation have been used but clearly it is possible to extend the analysis.

Where $p_{i,t}$ is the seat share of party i at time t and n refers to the number of parties that obtained seats. This index – based on Hymer and Pashigian’s (1962) market share mobility index – can be interpreted as a measure for the change in the electoral success of parties over time. Higher values of the index refer to higher volatility in the sense that there is larger variation over time in the seat shares obtained by parties competing in the elections. Thus, higher values indicate a higher level of political competition in the municipality.¹²

3.2 Empirical results

Before presenting the results of the estimations, a number of methodological issues remain to be mentioned. Firstly, the dependent variable is constrained to a maximum of unity (i.e. it is right-censored at 1). Whilst this may not be severe as only a small proportion of the municipalities are actually on the production frontier, it is nonetheless a problem that must be addressed. The obvious way to deal with this issue is by employing a Tobit analysis. However, matters are further complicated by the fact that it is by no means clear that all the independent variables are actually exogenous. For example, if the governing party / parties are inefficient, this may lead to greater competition. Similarly, inefficiency may lead to debt or efficiency to surpluses. Moreover, if the rich are better at demanding efficiency, this may lead to a Tiebout effect whereby rich people move into the area (either for the lower taxes directly or, more indirectly, via better services for the taxes they pay; see Oates, 1969). To accommodate for this possibility, it is necessary to consider estimation via instrumental variables. As no instruments are readily available, artificial variables need to be constructed following the procedures suggested by Dagenais and Dagenais (1997), which is an econometric variant of statistical work on orthogonality using higher moments.¹³

Let us now turn to the estimation results. So that a complete picture of the effects can be seen, a number of different results are given in tables 1 and 2. In table 1, we present a set of results that use only the political variables and thus these results have been derived from a sort of reduced form equation (though even here there are possibilities of endogeneity which are examined). In table 2, there is a full estimation so that other factors that may affect efficiency can also be examined. This allows us to check whether the results from the reduced form equation are robust to the inclusion of these additional explanatory variables.

The first factor to note is the general robustness and consistency of the results over the two tables. Generally, as can be seen from the diagnostic tests, the equations are well specified.¹⁴ It

¹² Though two versions of this variable were considered (using either seat or vote shares) there was little difference in the results such that only the results for seats are given below. Note also that in all cases, for the political variables, an average of the number of parties over the last four elections of 1982, 1988, 1994 and 2000 are used. The results are hardly changed if only the three prior elections (i.e. prior to 2000) are used to construct this figure.

¹³ In an ideal world, estimation would be made using instrumental variables within Tobit analysis. However, as can be seen, there is considerable robustness in the estimations hence a series of results are given.

¹⁴ Examination was made of different functional forms for the independent variables, notably examining logs. The overall effect was marginal and J-tests did not indicate one form or the other as superior. We present the results from the linear specification only as these proved superior in terms of goodness-of-fit. Following Ashworth *et al.* (2006), examination was also given to non-linear effects for the political variables. The addition of such variables proved to be insignificant and when examined in place of the dummy for sole power, the turning point proved to be between one and two parties in all cases. Again, as the fit was superior for the results with the sole party dummy,

is clear from a comparison of the Tobit and other results that the truncation problem is slight. Further, the use of instrumental variables does not have a large effect on the tenor of the results. Thus a general interpretation is given, though the preferred results are those using the instrumental variables (as they cover the potentially most damaging problem).

Initial consideration is given to the control variables before moving to the competition variables. Firstly, a number of the variables do not seem to affect efficiency: income distribution and population concentration. Secondly, debt and surplus affect efficiency in opposite ways with debt from the previous period adversely affecting efficiency and surplus increasing it (with the positive effect of the surplus greater than the negative effect of the debt). Thirdly, the total tax burden has a negative effect on efficiency, which suggests that larger governments are less efficient. Finally, an increase in income per capita actually leads to less efficiency. This could imply that the rich are not better at demanding higher value for the taxes they pay (or possibly bother less about it). Importantly, the only variable that fails to be robust (in terms of losing or gaining statistical significance) over the different estimation methods employed is grants.

Turning to competition, we first of all find that government competition leads to lower levels of government efficiency. A possible explanation is that competition over resources within government leads to inefficiency. As can be seen, sole party governments are more efficient and the decline in efficiency (though this effect is on the borderline of significance) increases the more parties there are involved in government with the range of opinions in the parliament (the potential competition at the next election not significantly offsetting this effect). Also, the size of the majority does not offset any of these tendencies. Further, in addition to the negative effect of large public sectors (as measured by tax revenue), there is an indication that right-wing governments in Flanders are more efficient than left-wing governments.

Finally, does competition in the electoral process lead to efficiency? There is a clear positive answer to this and hence supporting the work of Svensson (1998) and Besley *et al.* (2005). The greater the competition (in terms of the number of parties), the greater the efficiency. However, this result is tempered a little by the effect of political volatility. This appears to lead to more inefficiency in government provision of public goods (though the effect is insignificant). Hence, what appears to be needed for efficiency is competition amongst stable factions. Under those conditions, the voters will get greater efficiency from their governments. This raises the issue of whether the competition at elections outweighs the potential costs in government. If more competition at elections leads to more fragmented governments, which of the competing effects dominates then? A consideration of the coefficients would suggest that the electoral effect is greater than the government effect and so it can be concluded that **competition thus leads to efficient governments**¹⁵.

these are the results presented. It is of note that if the government fragmentation variables are removed and only electoral fragmentation is included, competition remains significant with around the same sized effect and, indeed, its significance is increased. The insignificance of the volatility results is also unchanged.

¹⁵ It can be seen that this is unequivocal for the IVE estimations but less clear for the Tobit though given the relative sizes of number of parties at elections and numbers in coalitions, the efficiency driver is likely to dominate. In addition, it should be noted that the fragmentation in government borders on significance.

5. Conclusion

Political competition has been identified as a mechanism that disciplines the political leadership. Testing this proposition on a set of 308 Flemish municipalities, we find clear support for it. The electoral competition – measured in terms of the number of parties that participate in the election – has a significant and positive effect on the efficiency of municipal policy. However, these beneficial effects are mitigated somewhat in that such competition may lead to fragmented governments and there is some evidence that such fragmentation works against efficiency. Overall, though, the beneficial effects outweigh the negative and the conclusion is that competition is a force for efficiency in Flanders.

References

- Aigner, D.J., C.A.K. Lovell and P. Schmidt (1977), Formulation and Estimation of Stochastic Frontier Production Function Models, *Journal of Econometrics*, 6, 21–37.
- Alesina, A., & Drazen, A. (1991). Why are stabilizations delayed? *American Economic Review*, 81, 1170–1188.
- Ashworth, J., B. Geys and B. Heyndels (2003), Income Tax Base Evolution in Brussels 1980-1999: The Budgetary Value of the Rich. In E. Witte, A. Alen, H. Dumont, P. Vandernoot and R. De Groof (Eds.), *De Brusselse negentien gemeenten en het Brussels model*, Gent: Larcier, pp. 165-181.
- Ashworth, J., B. Geys and B. Heyndels (2005), Government Weakness and Local Public Debt Development in Flemish Municipalities, *International Tax and Public Finance*, 12(4), 395-422.
- Ashworth, J., B. Geys and B. Heyndels (2006), Determinants of Tax Innovation: The Case of Environmental Taxes in Flemish Municipalities, *European Journal of Political Economy*, forthcoming.
- Becker, G.S. (1983), A Theory of Competition among Pressure Groups for Political Influence, *Quarterly Journal of Economics*, 98 (3), 371-400.
- Besley, T., T. Persson and D. Sturm (2005), Political Competition and Economic Performance: Theory and Evidence from the United States, *NBER Working Paper*, nr. 11484, 39 pp.
- Boyne, G.A. (2003), Sources of Public Service Improvement: A Critical Review and Research Agenda, *Journal of Public Administration and Management*, 13(3), 367-394.
- Buchanan, J.M. and R.E. Wagner (1977), *Democracy in Deficit*, New York: Academic Press.
- Chesher A. and M. Irish, 1987, Residual Analysis in the Grouped and Censored Normal Linear Model, *Journal of Econometrics*, 34, 33-61.
- Coffé, H., and Geys, B., 2005, Institutional Performance and Social Capital: An Application to the Local Government Level, *Journal of Urban Affairs*, 27, 485-501
- Costa-I-Font, J., E. Rodriguez-Oreggia and D. Lunapla (2003), Political Competition and Pork-Barrel Politics in the Allocation of Public Investment in Mexico, *Public Choice*, 116, 185-204.
- Dagenais, M.G. and D.L. Dagenais, 1997, Higher Moment Estimators for Linear Regression Models with Errors in Variables, *Journal of Econometrics*, 76, 193-221.
- Davidson, R. and J.G. MacKinnon, 1981, Several Test for Model Specification in the Presence of Alternative Hypotheses, *Econometrica*, 49, 781-793.
- De Borger, B. and K. Kerstens (1996), Cost Efficiency of Belgian Local Governments: A Comparative Analysis of FDH, DEA and Econometric Approaches, *Regional Science and Urban Economics*, 26, 145-170.
- De Borger, B. and K. Kerstens (2000), What is known about Municipal Efficiency? The Belgian Case and Beyond, in J. Blank (ed.), *Public Provision and Performance: Contributions from Efficiency and Productivity Measurement*, Amsterdam: Elsevier, pp. 299-330.
- De Borger, B., K. Kerstens, W. Moesen and J. Vanneste (1994), Explaining Differences in Productive Efficiency: An Application to Belgian Municipalities, *Public Choice*, 80, 339-358.
- Dexia (2001), *De Financiën van de Lokale Overheden in 2000*, Brussel: Dexia Bank NV.
- Dhrymes P.J. (1986), Limited Dependent Variables, in Z. Griliches and M.D. Intriligator (eds) *Handbook of Econometrics*, vol. III, Amsterdam: North Holland.

- Dye, T.R. (1984), Party and Politics in the States, *Journal of Politics*, 46, 1097-1116.
- Farrell, M. (1957), The Measurement of Productive Efficiency, *Journal of the Royal Statistical Society, Series A: General*, 120, 253-281.
- Gilligan, T.W. and J.G. Matsusaka (1995), Deviations from Constituent Interests: The Role of Legislative Structure and Political Parties in the States, *Economic Inquiry*, 23, 383-401.
- Goeminne S., B. Geys and C. Smolders (2005), Political Fragmentation and Projected Tax Income: Evidence from Flemish Municipalities, *mimeo*.
- Grossman, P.J., P. Mavros and R.W. Wassmer (1999), Public Sector Technical Inefficiency in Large US Cities, *Journal of Urban Economics*, 46, 278-299.
- Grossman, G.M. and E. Helpman (1996), Electoral Competition and Special Interest Politics, *Review of Economic Studies*, 63, 265-286.
- Holbrook, T.M. and E. Van Dunk (1993), Electoral Competition in the American States, *American political Science Review*, 87 (4), 955-962.
- Hymer, S. and Pashigian, P., (1962), Turnover of firms as a measure of market behavior, *Review of Economics and Statistics*, 44, 82-87.
- Key, V.O. Jr. (1949), *Southern Politics in State and Nation*, New York: Vintage.
- Knack, S. (2002), Social Capital and the Quality of Government: Evidence from the States, *American Journal of Political Science*, 46(4), 772-785.
- Lake, D.A. and M.A. Baum (2001), The Invisible Hand of Democracy: Political Control and the Provision of Public Services, *Comparative Political Studies*, 34 (6), 587-621.
- Levitt, M. and M. Joyce (1987), *The Growth and Efficiency of Public Spending*, Cambridge: Cambridge University Press.
- Lewbel, A., 1997, Constructing Instruments for Regressions with Measurement Error When No Additional Data are Available, with an Application to Patents and R&D, *Econometrica*, 65, 1201-1213.
- Lizzeri, A. and N. Persico (2002), The Drawbacks of Electoral Competition, New York University, *mimeo*.
- Lovell, C.A.K. (1993), Production Frontiers and Productive Efficiency, in H. Fried, C.A.K. Lovell and S. Schmidt (eds.), *The Measurement of Productive Efficiency: Techniques and Applications*, Oxford: Oxford University Press, pp. 3-67.
- McKean, R.N. (1965), The Unseen Hand in Government, *American Economic Review*, 55 (3), 496-506.
- Meeusen, W. and J. van den Broeck (1977), Efficiency Estimation from Cobb-Douglas Production Functions with Composed Error, *International Economic Review*, 18 (2), 435-444.
- Mueller, D.C. and P. Murrell (1986), Interest Groups and the Size of Government, *Public Choice*, 48, 125-145.
- Mueller, D.C. (2003), *Public Choice III*, Cambridge: Cambridge University Press.
- Mulligan, C.B., R. Gil and X. Sala-i-Martin (2004), Do Democracies have Different Public Policies than Nondemocracies?, *Journal of Economic Perspectives*, 18(1), 51-74.
- Oates, W.E., (1969), The Effects of Property Taxes and Local Public Spending on Property values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis, *Journal of Political Economy*, 77, 957-971.

- Pagan A. and F. Vella (1989), Diagnostic Tests for Models on Individual Data: A Survey, *Journal of Applied Econometrics*, 4, S29-S59.
- Pedersen, M.N., (1979), The Dynamics of European Party Systems: Changing Patterns of Electoral Volatility, *European Journal of Political Research*, 7, 1-26.
- Pinto, P.M. and J.F. Timmons (2005), The Political Determinants of Economic Performance: Political Competition and the Sources of Growth, *Comparative Political Studies*, 38(1), 26-50.
- Polo, M. (1998), Electoral Competition and political Rents, *IGIER Working paper*, nr. 144, 28 pp.
- Przeworski, A. and F. Limongi (1993), Political Regimes and Economic Growth, *Journal of Economic Perspectives*, 7, 51-69.
- Rogers, D.L. and J.H. Rogers (2000), Political Competition and State Government Size: Do Tighter Elections Produce Looser Budgets?, *Public Choice*, 105, 1-21.
- Roubini, N. and J.D. Sachs (1989), Political and Economic Determinants of Budget Deficits in the Industrial Democracies, *European Economic Review*, 33, 903-938.
- Skilling, D. and R.J. Zeckhauser (2002), Political Competition and Debt Trajectories in Japan and the OECD, *Japan and the World Economy*, 14, 121-135.
- Stigler, G. J. (1972), Economic Competition and Political Competition, *Public Choice*, 13, 91-106.
- Svensson, J. (1998), Controlling Spending: Electoral Competition, Polarization and Endogenous Platforms, Stockholm University, *mimeo*.
- Tsebelis, G. (1995). Decision-making in political systems: Veto players in presidentialism, parliamentarism, multicameralism and multipartyism. *British Journal of Political Science*, 25(3), 289-325.
- Vanden Eeckhaut, P., H. Tulkens and M. Jamar (1993), Cost Efficiency in Belgian Municipalities, in H. Fried, C.A.K. Lovell and S. Schmidt (Eds.), *The Measurement of Productive Efficiency: Techniques and Applications*, Oxford: Oxford University Press, pp. 300-334
- Veall M.R. and K.F. Zimmermann (1996), Pseudo-R² Measures for Some Common Limited Dependent Variable Models, *Journal of Economic Surveys*, 10, 241-259.
- Volkerink, B., & de Haan, J. (2001). Fragmented government effects on fiscal policy: New evidence. *Public Choice*, 109, 221-242.
- West, E.G. and S.L. Winer (1980), Optimal Fiscal Illusion and the Size of Government, *Public Choice*, 35, 607-622.
- Wilson, J.K. and R. Damania (2005), Corruption, Political Competition and Environmental Policy, *Journal of Environmental Economics and Management*, 49(3), 516-535.
- Wittman, D. (1989), Why Democracies produce Efficient Results, *Journal of Political Economy*, 97(6), 1395-1424.
- Wittman, D. (1995), *The Myth of Democratic Failure: Why Political Institutions are Efficient*, Chicago: Chicago University Press.

TABLE 1
THE EFFECT OF POLITICAL COMPETITION AND VOLATILITY ON THE EFFICIENCY OF LOCAL GOVERNMENT IN FLANDERS (POLITICAL VARIABLES ONLY)

Dependent Variable	Efficiency*	Efficiency*	Efficiency*	Efficiency*	Efficiency*	Efficiency*
Number of Observations	308	308	308	308	308	308
Independent Variables	OLS	IVE	TOBIT	TOBIT	TOBIT	IVE
Intercept	0.252 (0.125)	0.257 (0.125)	0.224 (0.137)	0.261 (0.136)	0.272 (0.136)	0.260 (0.126)
Excess Seats (EXSEAT)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)			
Number of Parties in Election (PAREL)	0.059 (0.011)	0.055 (0.012)	0.080 (0.013)	0.063 (0.008)	0.063 (0.008)	0.049 (0.007)
SOLE POWER	0.035 (0.018)	0.035 (0.017)	0.042 (0.023)	0.041 (0.234)	0.044 (0.023)	0.037 (0.018)
Number of Parties in Parliament (NUMPARL)	-0.010 (0.018)	-0.003 (0.018)	-0.030 (0.021)			
Number of Parties in Coalition (NUMCOAL)	-0.025 (0.012)	-0.025 (0.012)	-0.025 (0.012)	-0.036 (0.014)	-0.032 (0.016)	-0.028 (0.012)
Ideology -Left to Right (IDEO)	0.042 (0.023)	0.042 (0.023)	0.045 (0.024)	0.048 (0.025)	0.046 (0.025)	0.045 (0.022)
Volatility of seats (VOLS) – scaled by 100					-0.031 (0.021)	
Sigma			0.162 (0.007)	0.163 (0.007)	0.162 (0.007)	
+R ²	0.223	0.223	0.238	0.213	0.223	0.218
Diagnostic Tests						
NORMALITY	5.526	5.707	3.778	4.117	5.522	5.774
RESET ²	0.120	0.025	1.224	1.403	1.661	0.240
RESET ³	0.411	0.322	0.883	1.296	1.448	0.441
<i>Heteorscedasticity</i>						
White	0.853	2.178	1.991	2.007	3.113	1.632
Sargan		4.881				4.623
Hausman (IV Exogeneity)		1.223				1.447
INSIG				3.724		0.969

Notes: *Efficiency is calculated by relating total municipal expenditures to levels of subsistence grant beneficiaries, pupils in primary schools, recreational facilities, population size and fraction of old people in the population) with variable returns to scale, see Coffe and Geys (2005) for further details. The Sargan test of mis-specification of the instruments indicates that the choice is satisfactory. Similarly, the Hausman test indicating exogeneity implies a satisfactory estimating equation. INSIG is the test of omitting the variables from the most general version of the model in column 4 to column 5. Estimated standard errors are in parentheses; LL is the maximised value of the log-likelihood function; +, in the case of the Tobit models, these are Pseudo R² is a measure as suggested by Veall and Zimmermann (1996), following Dhrymes (1986). Diagnostic tests for the Tobit model are computed following Pagan and Vella (1989) and follow a t distribution. The only exceptions are those for White unknown form heteroscedasticity test and normality which are computed following Chesher and Irish (1987) and follow a χ^2 distribution with degrees of freedom as indicated. The instruments used are a constant, $z_1 = x^*x$, and $z_4 = x^*x^*x - 3x[E(x^*x/N)*I_k]$ with x reflecting the right hand side variables in the equation and * designating the Hadamard element by element matrix multiplication operator and the variables in deviation from mean form, see Dagenais and Dagenais, (1997, 197-198).

TABLE 2
THE EFFECT OF POLITICAL COMPETITION AND VOLATILITY ON THE EFFICIENCY OF LOCAL GOVERNMENT IN
FLANDERS (POLITICAL AND ECONOMIC VARIABLES)

Dependent Variable	Efficiency*	Efficiency*	Efficiency*	Efficiency*	Efficiency*	Efficiency*
Number of Observations	308	308	308	308	308	308
Independent Variables	OLS	IVE	TOBIT	OLS	IVE	TOBIT
Intercept	0.582 (0.149)	0.508 (0.117)	0.388 (0.141)	0.569 (0.113)	0.850 (0.186)	0.427 (0.132)
Number of Parties in Election (PAREL)	0.049 (0.007)	0.058 (0.011)	0.047 (0.014)	0.062 (0.007)	0.074 (0.012)	0.051 (0.011)
SOLE POWER	0.034 (0.018)	0.058 (0.027)	0.037 (0.019)	0.032 (0.017)	0.058 (0.027)	0.041 (0.020)
Excess seats (EXCESS)	0.002 (0.0015)	0.002 (0.002)	0.002 (0.002)			
Number of Parties in Coalition (NUMCOAL)	-0.027 (0.015)	-0.023 (0.012)	-0.073 (0.033)	-0.031 (0.016)	-0.023 (0.014)	-0.062 (0.035)
NUMPARL	0.009 (0.018)	-0.007 (0.025)	0.006 (0.027)			
Ideology -Left to Right (IDEO)	0.038 (0.020)	0.038 (0.020)	0.050 (0.020)	0.042 (0.020)	0.038 (0.021)	0.052 (0.022)
Volatility of seats (VOLS) – scaled by 100	-0.006 (0.007)	-0.006 (0.004)	-0.024 (0.021)			
INCOME (x1000)	-0.010 (0.005)	-0.019 (0.010)	-0.006 (0.004)	-0.011 (0.005)	-0.018 (0.009)	-0.007 (0.004)
INCOME DISPERSION	0.003 (0.010)	0.004 (0.023)	0.003 (0.013)			
SURPLUS (PREVIOUS YEAR)	0.041 (0.010)	0.032 (0.014)	0.032 (0.015)	0.043 (0.010)	0.031 (0.015)	0.033 (0.015)
DEBT (PREVIOUS YEAR)	-0.017 (0.008)	-0.019 (0.009)	-0.013 (0.007)	-0.018 (0.008)	-0.018 (0.009)	-0.014 (0.007)
TAX REVENUE	-0.190 (0.033)	-0.391 (0.221)	-0.235 (0.034)	-0.193 (0.003)	-0.319 (0.181)	-0.247 (0.035)
POPULATION	0.002 (0.001)	0.002 (0.001)	0.007 (0.001)	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)
POPULATION DENSITY	-0.005 (0.023)	-0.005 (0.023)	-0.004 (0.027)			
GRANTS	0.004 (0.002)	0.003 (0.002)	0.004 (0.003)	0.004 (0.002)	0.004 (0.002)	0.004 (0.002)
Sigma			0.129 (0.005)			0.130 (0.006)
+R ²	0.442	0.207	0.438	0.427	0.199	0.421
Diagnostic Tests						
NORMALITY	4.218	7.442	3.771	4.308	6.002	4.889
RESET ²	1.789	0.284	0.996	0.002	0.340	1.661
RESET ³	1.441	0.552	1.117	0.332	0.996	1.223
<i>Heteroscedasticity</i>						
White	0.911	11.442	4.113	0.339	4.789	5.771
Sargan		3.748			7.667	
Hausman (IV Exogeneity)		0.887			1.003	
INSIG				2.006	1.442	1.885

Notes: *Efficiency is the efficiency as calculated relating total municipal expenditures to levels of subsistence grant beneficiaries, pupils in primary schools, recreational facilities, population size and fraction of old people in the population) with variable returns to scale, see Coffe and Geys (2005) for further details. The Sargan test of mis-specification of the instruments indicates that the choice is satisfactory. Similarly, the Hausman test indicating exogeneity implies a satisfactory estimating equation. INSIG is the test of omitting the variables from the most general version of the model in column 4 to column 5. Estimated standard errors are in parentheses; LL is the maximised value of the log-likelihood function; +, in the case of the Tobit models, these are Pseudo R² is a measure as suggested by Veall and Zimmermann (1996), following Dhrymes (1986). Diagnostic tests for the Tobit model are computed following Pagan and Vella (1989) and follow a t distribution. The only exceptions are those for White unknown form heteroscedasticity test and normality which are computed following Chesher and Irish (1987) and follow a χ^2 distribution with degrees of freedom as indicated. The instruments used are a constant, $z_1 = x^*x$, and $z_4 = x^*x^*x - 3x[E(x^*x/N)^*I_k]$ with x reflecting the right hand side variables in the equation and * designating the Hadamard element by element matrix multiplication operator and the variables in deviation from mean form, see Dagenais and Dagenais, (1997, 197-198). It should be noted that the removal of population and tax revenues which in various degrees go to make up the efficiency variable do not change the inference from the other variables

