Competition in the Political Arena and Local Government Performance[*]

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Abstract

Competition reduces rent extraction in private-sector firms. In this article, we empirically assess whether it similarly disciplines politicians by evaluating local-level governments' performance in Flanders. The results indicate that _electoral_ competition – measured via the number of parties competing in elections – significantly positively affects the productive efficiency of municipal policy. _Intertemporal_ competition – measured as the volatility of election outcomes over time – has a similar, but weaker, positive effect. These beneficial effects are mitigated by the fact that competition may lead to more fragmented governments, which is shown to work against their productive efficiency. Overall, though, the beneficial effects outweigh the unfavourable ones in our sample.

Keywords: Competition, Government performance, Productive efficiency, Rent extraction.

JEL: D72, H72, D78, H11.

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Introduction

Economists generally agree that competition in the private sector improves consumer welfare: i.e., prices are lower and quantities higher under (perfect) competition compared to a monopoly situation, leading to a dissipation of monopoly rents and a larger consumer surplus. Some scholars – in both economics and political science – likewise maintain that lack of competition induces rent extraction by politicians or, reversely, that "competition for political office reduces the potential for opportunism by politicians" (Wittman, 1989: 1396; see also Stigler, 1972; Becker, 1983; Holbrook and Van Dunk, 1993; Pinto and Timmons, 2005). The intuition is that a lack of political competitors moderates the extent to 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.

Empirical evaluations of this proposition have remained surprisingly scant (for exceptions, see Svensson, 1998; Besley *et al.*, 2008; Padovano and Ricciuti, 2009; De Paola and Scoppa, 2011). Moreover, most existing analyses provide only *indirect* evidence as higher rent extraction under non-competitive environments is inferred from variations in economic outcomes, rather than measured directly (more details below).[1] In contrast, this article aims to provide a more *direct* test by assessing (local) governments' productive efficiency. High (low) productive efficiency indicates that the government generates high (low) levels of public goods with limited (high) spending (Koopmans, 1951). As such, it reveals how (in)effectively the incumbent translates public spending into public goods – or, reversely, to what extent (s)he engages in rent extraction. While a very large literature has developed investigating the measurement and determinants of local government efficiency (e.g., Balaguer-Coll *et al.*, 2007; Borge *et al.*, 2008;

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[1] In an interesting alternative approach, Norris (1996) and Becker et al. (2009) show that MPs facing a low degree of electoral competition have significantly more extra-parliamentary positions and earnings, respectively. Geys (2013) furthermore suggests that politicians in competitive districts adjust their extra-parliamentary positions more extensively prior to elections. While these findings suggests a different time-use of such politicians, it need not necessarily reflect rent extraction.

Kalb *et al.*, 2012; for reviews, see De Borger and Kerstens, 2000; Kalb, 2010), existing studies in this field fail, to the best of our knowledge, to take into account the potential importance of political competition. Our study provides a first step towards bridging this gap.

To capture the potential influence of different aspects of competition in the political arena in our analysis, we rely on two measures of competition: i.e. the number of parties competing in elections (i.e. *electoral* competition) and the volatility of election outcomes over time (i.e. *intertemporal* competition). While we defend the use of these measures in more detail below, the former reflects the level of competition *at a certain point in time*, whereas the latter intends to capture the degree of competition *over a certain period of time*.[2] Overall, the results – using data from 308 Flemish municipal governments in the year 2000 – corroborate that competition is associated with lower productive inefficiency. More specifically, *electoral* competition (i.e., the number of parties competing in the election) significantly positively affects the productive efficiency of municipal policy, whereas *intertemporal* competition (i.e., the volatility of election outcomes over time) has a similarly positive, but weaker, effect. While these effects are mitigated by the fact that competition may lead to more fragmented governments (which is shown to work against local governments' productive efficiency), the overall effect of competition remains positive in our sample.

The remainder of the paper is organised as follows. Section 1 briefly discusses the foregoing literature. Section 2 gives background information on the Flemish local institutional setting and

[2] As our focus lies on political competition *within* rather than *between* municipalities on governments' productive efficiency, we do *not* explicitly take into account the potential impacts of yardstick or tax competition. Both forms of competition may, however, involve politicians trying to discipline themselves – either to gain re-election or to attract a mobile tax base – and thus might reduce productive inefficiencies. Supportive evidence for such a view has been presented in, for instance, see Geys (2006) and Revelli and Tovmo (2007).

describes our indices of competition in the political arena. The results of the empirical analysis are in section 3. Section 4 concludes.

1. Literature overview

The policy consequences of competition in the political arena (henceforth also referred to as 'political competition') have been extensively discussed by both political scientists and (public) economists. Two main focal points can thereby be identified. First, several authors analyse the effects of political competition on the size of government and the type of policies pursued. This literature can be traced back to, at least, Key (1949), while more recent evidence is provided in, for instance, Holbrook and Van Dunk (1993), Ferris *et al.* (2008) and Aidt and Eterovic (2011). Second, substantial attention is awarded to the impact of competition on the productive and allocative efficiency of public goods provision. As the focus of the current article lies on governments' productive efficiency, the remainder of this section will restrict itself to studies focussing on productive (in)efficiency and the associated rent extraction.

Studies analysing the link between political competition and government productive efficiency generally argue that more stringent competition between parties (or politicians) is likely to lead to a reduction in rent extraction – much like economic competition in the private market reduces monopoly rents. Reversely, when competition in the political arena is low "the state will exercise its monopoly power, provide fewer public services, and earn greater rents" (Lake and Baum, 2001: 590). The reason is that competition for political office reduces the ability of politicians to engage in opportunistic behaviour. Such actions, in a competitive environment, could cost them reelection – whereas this is unlikely when there is a lack of (significant) competition. "Simply put, in the absence of competition, accountability suffers" (Holbrook and Van Dunk, 1993: 960) and incumbents can extract (higher) rents without jeopardizing their re-election odds.

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Formal (economic) analyses of this relation likewise support the proposition that "candidates' competition for office might induce a dissipation of political rents" (Polo, 1998: 3; see also Svensson, 1998; Besley *et al.*, 2010). A lack of competition in the political arena is thereby modelled as a bias in the number of committed voters in favour of one party (Polo, 1998; Besley *et al.*, 2010) or the absence of a pool of non-committed voters that could 'swing' the election outcome (Svensson, 1998). Still, Lizzeri and Persico (2005) show that defining competition through the number of parties in the system might lead to increases in the accommodation of special interest groups (and thus less efficient policies). This mirrors Polo (1998), who finds that rent extraction first decreases with the number of parties, but may then increase again.

To the best of our knowledge, empirical evaluations of the relation between political competition and governments' rent extraction are scant. Moreover, the evidence presented in the foregoing literature (e.g., Przeworski and Limongi, 1993; Svensson, 1998; Pinto and Timmons, 2005; Padovano and Ricciuti, 2009; Besley *et* al., 2010; De Paola and Scoppa, 2011) is based on a wide variety of political competition measures, and remains indirect since higher levels of rent extraction under non-competitive environments are inferred from variations in economic *outcomes* (such as economic growth rates) rather than analyses of actual *policies*. This approach, however, fails to explicitly test for incumbents' potential productive inefficiency or rent extraction.

Overall, it is clear from the above discussion that various approaches have been introduced to measure political competition, without reaching any consensus as to what constitutes the most appropriate measure. Particularly, both theoretically and empirically, scholars have relied on the number of parties competing in elections (e.g., Polo, 1998; Lizzeri and Persico, 2005), the vote share distribution in elections (e.g., Holbrook and Van Dunk, 1993; Vanhanen, 2000), the

seat division in parliament or government (e.g., Ferris et al., 2008), the time a given party (or political bloc) has been in power (e.g., Skilling and Zeckhauser, 2002) and so forth. Even though this variety suggests that the concept of political competition has multiple dimensions that are hard to adequately capture in one single indicator, most scholars assess only one measure in their analysis. Below, we instead include two measures intended to capture different dimensions of political competition. Moreover, by focusing on economic *outcomes*, previous scholarship could not directly address rent extraction. The present paper takes a first step at bridging this gap by assessing the relation between competition in the political arena and productive inefficiency in the provision of public goods in Flemish municipalities.

2. Institutional setting and measurement of competition

2.1. Local government in Flanders

Municipal governments are the lowest level of government in Flanders (and Belgium) next to the federal, regional and provincial levels. Nonetheless, they have considerable autonomy to pursue their own policies and assume significant responsibilities in education, local infrastructure, public safety, social welfare, … The political system in the Flemish municipalities can be characterized as a parliamentary system where the executive board is formed by a political majority. That is, local governments 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 (unlike in, for example, Norway, where the College reflects seats in the council; cf. Tovmo, 2007).

Several characteristics of the Flemish local institutional setting create a relatively low barrier to entry for aspiring politicians, which, in turn, allows for high levels of competition in the

political arena. Firstly, municipal inhabitants above age 18 can stand for election on the local council (subject to certain eligibility requirements, such as the absence of criminal convictions) and presenting a list in the municipal elections is easy (the proposed list should be presented four weeks prior to the elections accompanied by 5 to 100 signatures – depending on the size of the municipality – of individuals eligible to vote in the municipality). Secondly, elections take place using a system of Proportional Representation (i.e., highest average Imperiali – without legal thresholds). In such systems, even small parties can gain representation. Given that voters do not want to 'waste' their votes on parties that are unlikely to obtain a seat and party elites refrain from wasting resources on hopeless election campaigns (Duverger, 1954/1972) this low threshold of representation has a positive effect on parties' willingness to enter the political arena (Fiva and Folke, 2012).

2.2. Measuring political competition

Building on insights from the foregoing literature (see above), we rely on two measures of political competition that intend to capture two distinct aspects of this concept. The first, and most straightforward, measure is the number of parties that enter the electoral 'battle' (e.g., Polo, 1998; Lizzeri and Persico, 2005). The idea here is that with a larger number of parties contesting the election (ELPAR), political parties have to work harder to convince voters. This reflects the extent of competition *at a certain point in time*. Clearly, this simple measure ignores that competition is arguably higher when two parties of equal strength compete compared to the situation where one party has a significant lead over multiple others. This can in principle be addressed by applying weights to each party depending on its ex ante *expected* political strength (as obtained from, for instance, opinion polls). These are, however, not available in the Flemish municipal setting. Technically, one might use the *post-election* vote or seat division as an approximation. However, such post-election outcomes are less appropriate because they not only indicate the level of competition in the party system, but also capture possible gridlock

effects in policy-making (e.g., Roubini and Sachs, 1989; Ashworth *et al.*, 2005). To avoid these difficulties, we rely on the absolute number of parties competing in the main analysis (though robustness checks indicate qualitatively similar results when weighting parties with their vote or seat share; details upon request). On average, just over 5 parties compete in Flemish municipal elections – ranging from a minimum of 2 parties to a maximum of 13 parties (see Table A1 for summary statistics).

Our second measure of competition explicitly takes into account that at least part of the electorate is not fully committed to 'their' party, and that the struggle over this pool of floating voters induces competition between the parties (Svensson, 1998). Although we lack information on the number of non-committed voters, we can use historical information on changes in parties' 'market shares' as a proxy. This change in the electoral fortunes of parties over time reflects the *intertemporal* degree of competition, and can be captured using a measure of political volatility (Pedersen, 1979): $VOLATILITY_{t-1,t} = \frac{1}{2} \cdot \sum_{i=1}^{n} |p_{i,t} - p_{i,t-1}|$ where $p_{i,t}$ is the vote (or seat) share of party i in the election at time t and n refers to the number of parties. The index takes a value 0 if the vote (or seat) share of each party remains unchanged between two elections. The maximum value of 1 is reached when the full set of parties in the election at t-1 is replaced by a non-overlapping alternative set of 'new' parties. As such, higher values of the index indicate higher volatility in vote (or seat) shares – and therefore point to fiercer competition. We calculate this measure of VOLATILITY over four electoral cycles since the amalgamation of Flemish municipalities in 1976 (i.e., 1976-1982, 1982-1988, 1988-1994 and 1994-2000) using data for each of the seven 'parties' in Flanders (i.e., GROEN!, SP.a, CD&V, VU, VLD, Vlaams Belang and the miscellaneous group of 'others', which combines all local

parties) in all 308 Flemish municipalities.[3] Then, we take the unweighted average over these four electoral periods as our measure of intertemporal competitiveness of a municipality:

$$POLVOL = \frac{1}{4} \cdot \sum\nolimits_{t=1}^{4} VOLATILITY_{t-1,t} \, .$$

It should be noted that the POLVOL measure reflects both demand and supply side changes. The former refer, as discussed, to non-committed voters changing parties, while the latter are related to party mergers, break ups or other changes in their composition or their name. This occurs relatively frequently in Flanders, especially within and amongst local parties (Vermeir and Heyndels, 2006). While demand-side volatility is expected to put competitive pressure on politicians, the incentives from supply-side induced volatility are less clear – and one can argue that some of these changes do not imply 'true' political volatility (e.g., name changes). Lacking detailed information on these supply-side changes, we adopt an empirical approach to reduce their impact on POLVOL.[4] Particularly, we purge elections in municipalities where at least one party shows a gain or loss that can be deemed 'too strong' to reflect the political reality within the municipality. We thereby define 'too strong' as changes in excess of 10% of seats since such drastic shifts are more likely due to a party, say, changing its name than to voters' changing their commitments and votes. This implies that our (corrected) measure of intertemporal competition in municipality i (POLVOL-*10*) equals the average political volatility excluding those elections where at least one party surpassed the 10-percent change.

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[3] While this rest category is clearly not optimal, our data do not allow us to track the electoral rise and fall of each separate local party. Note also that two versions of this variable were considered, using either seat or vote shares. The tenor of the results is not affected by this choice and we use seats throughout the analysis presented.

[4] Ideally, such supply-side elements are dealt with by checking for each case what happened using, for example, newspaper articles. Given the absence of such information for many of the (especially smaller) Flemish municipalities, this is unfortunately unfeasible. Hence, we opted for the empirical approach discussed in the main text.

Table A1 in appendix shows that the average value for our POLVOL measure equals 20.93%, indicating that political parties are confronted with a (net) change of one out of five voters in every election. Still, correcting for supply-side volatility in POLVOL-10 strongly reduces observed volatility to 7.38%. It should be observed that the corrected measure of volatility (POLVOL-*10*) can at times not be calculated in a municipality as there was at least one party which vote share changed by 10% or more in *every* election over the period. This is the case for 72 of the 308 municipalities and in the empirical analysis, we pick this up by giving these municipalities the maximum observed volatility and adding a dummy variable (DVOL*10+*) equal to 1 if the municipality was in that situation (i.e., 'imputed' maximum volatility) and 0 in all other cases.[5]

3. Empirical analysis

3.1 Dependent variable: Government productive efficiency

Productively efficient governments can be defined as those that need fewer resources to generate a high level of public goods while productively inefficient governments use a high level of resources to generate moderate or low levels of public goods (Koopmans, 1951). Given this definition, a measure of government efficiency can be devised by relating a jurisdiction's total expenditures (i.e., the inputs used) to its provision of public goods (i.e., the outputs produced). We relate inputs and outputs via the non-parametric approach of Data Envelopment Analysis (assuming constant returns to scale) developed by Farrell (1957). In this approach, a 'best practice' frontier is generated as a linear envelopment of the data and any deviation from the best practice frontier is interpreted as productive inefficiency. Technically,

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[5] We also experimented with less restrictive cut-offs at changes in excess of 15% and 20% of the seats. For POLVOL-15 and POLVOL-20, the average value of the volatility index equals 10.34% and 12.24%, respectively. There are 24 and 10 cases, respectively, where the measure cannot be calculated using these cut-offs. Estimation results using these alternative variables lie between those for unregulated partisan shifts (POLVOL) and the most "severe" restriction at 10% (POLVOL-10) (details on request).

the best practice frontier is constructed by solving a linear programming problem of the following form (Lovell, 1993):

$$\underset{\{\lambda_k, z_1, \ldots, z_n\}}{\operatorname{Min}} \lambda_k \tag{1}$$

$$\text{Subject to: } \lambda_k C_k - \sum_{j=1}^{n} z_j C_j \geq 0$$

$$\sum_{j=1}^{n} z_j y_{jr} \geq y_{kr} \qquad \text{with } r = 1, \ldots, s$$

$$\lambda_k, z_j \geq 0 \qquad \text{for } j = 1, \ldots, n$$

Where C_k and C_j represent total inputs employed by organisation k and j respectively, y_{kr} and y_{jr} denote the output level for organisations k and j with respect to output r, s equals the number of outputs taken into account and n is the number of organisations under study. Finally, z_j are weights given to the organisations with which organisation k is compared in the determination of its productive (in)efficiency. In equilibrium, the value of the objective function, λ_k, represents how efficient organisation k employs its inputs (C_k) in the production of its outputs (r = 1, …, s).

Note that equation (1) assumes that jurisdictions can linearly scale input and outputs (see 'DEA-crs' representation in figure 1), which may be overly restrictive. We can, however, allow for variable returns to scale in the above linear programming problem by adding one additional constraint (i.e. $\sum_{j=1}^{n} z_j = 0$) to equation (1). While this generates a piecewise linear best practice frontier (see 'DEA-vrs' representation in figure 1), it still imposes strict convexity of this frontier. Adding one further restriction ($z_j \in \{0, 1\}$) also relaxes this and creates a frontier with a staircase shape in the input-output space (see 'FDH' representation in figure 1). Although we calculated all three measures of productive efficiency, their results were all highly

correlated and the final choice for the estimations below was determined by the measure that gave the best fit (i.e. DEA-CRS).[6]

Figure 1 about here

Our input variable equals total expenditures in the municipality in the fiscal year 2000. 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, social, administrative and recreational services). Following previous work on local government productive efficiency (for an extensive review, see Kalb, 2010), we thereby use the following proxies for public outputs: (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) garbage clearance, (e) the surface of public recreational facilities (in hectare), and (f) the length of the municipal road infrastructure. In all cases, productive efficiency is increased whenever more services can be rendered (e.g., more roads maintained, more students taught, more garbage collected, and so forth) for a given amount of inputs. Though following accepted practice in the literature (Kalb, 2010), these output indicators are obviously not ideal. For example, the number of subsistence grants beneficiaries is a rather crude proxy for the services rendered to low-income families. Unfortunately, better measures are not available, nor is information on the quality of outputs. This, regrettably, reflects the general problem with defining and measuring public sector inputs and outputs (see Levitt and Joyce, 1987; De Borger and Kerstens, 1996). Admittedly, such problems are less severe when concentrating on productive

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[6] Given the existence of measurement error and other stochastic influences, it may not be appropriate to designate all deviations from the frontier as inefficiency (Aigner *et al.*, 1977; Meeusen and van den Broeck, 1977). Yet, addressing this through the calculation of productive efficiency using stochastic frontier approaches does not affect our inferences below. Note also that building the best practice frontier based on the decision-making units at hand (the only possibility in real-world applications) implies that the ensuing efficiency measures are by definition relative rather than absolute measures.

efficiency in given areas of public good provision, such as waste collection, tax administration or road maintenance (Kalseth and Rattsø, 1995; De Borger and Kerstens, 2000). However, such a more restricted analysis is not warranted for our purpose since political competition is likely to affect the management of the public sector as a whole. A focus on one particular aspect of service provision may thus be inadequate (or, indeed, misleading).[7]

For the productive efficiency measure deriving from this analysis, it holds that higher values point to more efficient municipalities with a limit at unity for municipalities on the efficiency hull. As shown by Figure 1, there is considerable variation in the level of productive (in)efficiency across the Flemish municipalities. The mean productive efficiency level being 58.72%, ranging from just over 26% efficient to fully efficient (see also Table A1 in the appendix).

Figure 2 about here

3.2 Empirical model

Most basically, our empirical model assessing whether competition affects politicians' rent-seeking behaviour can be written as:

$$\text{EFFICIENCY}_j = b_0 + b_1 \text{ COMPETITION}_j + b_2 \text{ CONTROL}_j + u_j \tag{2}$$

Where EFFICIENCY is the measure of government performance calculated as the value of the objective function, λ_k, in equation (1) in section 3.1. COMPETITION is a vector of two variables reflecting different aspects of the extent of competition in the political arena within the

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[7] Though panel data might resolve some of these measurement issues, time series data were not available for various output variables.

municipality (as defined in section 2.2). We thereby rely on data from all 308 Flemish municipalities in 2000. While subscript j indicates the jth municipality and u_j represents the error term (assumed to be i.i.d.), CONTROL is a vector of control variables capturing potential influences from respectively the demand side, the budgetary situation and the political context.

Demand-side variables include per capita income (INCOME; in 1000€), income equality (INEQ), population size (POPULATION) and population density (DENS; as inhabitants per km²). The wealth of residents as measured by their average income may be important when the use of up-to-date techniques (which enable productive efficiency) is limited by the wealth of the community and its inhabitants. Furthermore, the rich may be more effective in (and have bigger incentives for) demanding greater productive efficiency (Knack, 2002). On the other hand, a wealthy population might simplify raising revenue, limiting the requirements to be efficient. Income inequality (INEQ), measured by the ratio of the interquartile difference in income to the median value, is a proxy for heterogeneity in the population. Such heterogeneity may imply a more complex set of needs and/or demands for public good provision (Jottier *et al.*, 2012), making efficient policy less evident. Finally, population size examines scale economies, while population density may serve as a proxy for a number of social problems that are associated with urban centres and which may make achieving productive efficiency more difficult. On the other hand, and more from a supply-side point of view, services (such as, say, care for the elderly) may be harder to provide if the population is less heavily concentrated.

The budgetary context of the municipality may affect productive efficiency ratings and is measured through four variables. Firstly, we include total municipal tax revenues (TAXREV, per capita; in €) and unconditional grants (GRANT, per capita; in €) as local governments' accountability to the public (for taxes) and the Regional governments (who provide the grants) may differ. Hence, the share of these respective revenue sources (which are the two main

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revenue sources) may differentially affect productive efficiency. Secondly, high indebtedness carried over from the past may limit a municipalities' ability to be efficient in a given year (as interests and amortization payments reduce the funds available to provide public goods in the current period). Yet, a municipality may also get the benefits of historical (debt-financed) investments without needing to resort to additional spending in the current time period and so presently is (apparently) more efficient.[8] For this reason, we control for past budgetary behaviour by including total local long-term public debt (DEBT, per capita; in €). Both arguments can be reversed for (current account) surpluses (SURPLUS; per capita; in €). Still, as debt and surplus may have asymmetric effects on productive efficiency, both variables must be examined separately.

Finally, we include four political control variables. Firstly, given that left-wing governments are generally assumed to favour larger public sector provision, the question arises whether this increase in size is efficient. Hence, we include the (weighted) average ideology of the incumbent party or parties (IDEO), which measures the ideology along a left (0) to right (10) scale. Secondly, government fragmentation has a negative impact on decision-making powers (e.g., Roubini and Sachs, 1989; Ashworth *et al.*, 2005; Goeminne *et al.*, 2008; Le Maux et al., 2011). To capture its potential effect on productive efficiency, we introduce two variables: a dummy variable (SOLE) indicating whether or not there is a single party government and a variable capturing the number of coalition parties (NUMCOAL). While single party governments do not suffer (as much) from a gridlock of decision-making (and thus have more 'opportunity' to be efficient), they may not have the incentive to be efficient as their monopoly power allows for higher rent extraction. However, the more parties in the government, the stronger gridlock effects, leading to lower productive efficiency. Finally, government efficiency

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[8] Flemish municipalities are in principle only allowed to generate debt for financing long-term capital investment projects (e.g., on infrastructure). Note that using debt relative to income (rather than per capita) provides qualitatively similar results to the ones presented.

may depend on the strength of the opposition. To capture this, we include the number of opposition parties and the size of the majority of the ruling party (or coalition) measured through the number of seats that it has (they have) relative to the combined opposition (EXCESS). We expect more comfortable majorities (and thus a weaker, smaller opposition) to have fewer incentives to be efficient.

3.3 Empirical results

Before presenting the results, a number of methodological issues should be mentioned. Firstly, the dependent variable is constrained to a maximum of unity. While this may not be severe as only a very small proportion of the municipalities are on the production frontier (i.e., 8 out of 308), the obvious way to deal with this is through a Truncation analysis.[9] Secondly, some independent variables might not be exogenous. For example, inefficient governments may lead to greater competition (e.g., more parties competing), higher indebtedness or lower budget surpluses. Moreover, if the rich demand higher productive efficiency, this may lead to a Tiebout-type sorting effect whereby rich people move into efficient areas. To accommodate for these possible endogeneity issues, we complement the Truncation results with results based on instrumental variables estimation (IVE). Since no instruments are readily available for all our independent variables, artificial variables were constructed based on orthogonality using higher moments (Dagenais and Dagenais, 1997).[10] These are by construction highly correlated with the independent variables, but uncorrelated with the dependent variable – making them intrinsically useful instruments (though arguably harder to interpret precisely). Finally, and crucially, there is the inherent difficulty – as outlined by Simar and Wilson (2007) – that a two-

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[9] This follows Simar and Wilson (2007), who discuss why this is more appropriate than the oft-used Tobit analysis.

[10] The instruments used are a constant, z_1 and z_4 where (with * designating the Hadamard element by element matrix multiplication operator and the variables in deviation from mean form)
$$z_1 = x*x; \qquad z_4 = x*x*x - 3x[E(x'x/N)*I_k].$$
with x reflecting the right hand side variables in the equation, see Dagenais and Dagenais (1997, 197-198). The choice was dictated by the Monte Carlo simulations of Dagenais and Dagenais (1997).

stage estimation procedure (with DEA estimation to produce the dependent variable for the second stage (in)efficiency regressions) suffers from "complicated, unknown serial correlation", which may lead to biased inferences.[11] To deal with this issue, we rely on their preferred algorithm #2 to re-examine, via boot-strapping techniques, the robustness of our estimates. This algorithm not only estimates appropriate confidence intervals, but also produces "parametric bias-corrected estimates" of the productive efficiency measure to deal with the additional complication that the initial efficiency estimates are biased when significant determinants of efficiency are retrieved in the second stage (see Simar and Wilson, 2007, for details).[12]

Turning to the estimation results, we present a number of different results in table 1, which vary in the estimation method employed to accommodate the various methodological issues raised above. Comparing the results from several relevant estimation techniques, we can give a more complete picture of the effects uncovered, while at the same time testing the robustness of our findings to the distributional assumptions made under the different approaches. Specifically, columns (2) through (4) in table 1 present a set of Truncated estimation results – which account for the bounded nature of our dependent variable – using the least restrictive measure of political volatility (POLVOL). Column (2) thereby presents the complete model, column (3) the confidence intervals from the boot-strapping correction, and column (4) removes insignificant variables. In column (5), we turn to an IV estimator to control for the possible endogeneity of some of our explanatory variables. For reasons of comparison, column

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[11] The key issue is that in many cases re-estimation using boot-strapping techniques might lead to results where the original estimates are not even within the confidence intervals of the corrected estimation; This is not the case in our analysis (see below).

[12] Once this bias adjustment is taken into account, eight further municipalities become "efficient". Note also that, in the Appendix, table A2 shows results using Simar and Wilson's (2007) algorithm #1, which involves only a bootstrap estimation of the second stage of the estimation. It can be seen by a comparison of table 1 and table A2 that the overall implications of the model are broadly unchanged, though correcting for the bias in the efficiency estimates further strengthens our central results.

(6) also presents results using OLS. In both cases, only the final model excluding insignificant variables is presented to preserve space. Finally, columns (7) through (9) repeat the preferred Truncated regression from columns (2) through (4) using the most restrictive 'outlier-corrected' version of the political volatility measure (i.e., POLVOL-10). Generally, as can be seen from the diagnostic tests, all equations are well specified.[13]

Table 1 about here

The first factor to note from table 1 is the general robustness and consistency of the results. Hence, it can be inferred that both the truncation problem – generated by the upper bound on our dependent variable – and the potential endogeneity of some explanatory variables have only limited effects on our findings. Secondly, all the estimated coefficients nicely fall within the boot-strapped confidence intervals in all cases, such that our results appear consistent both in terms of sign and significance. Turning first to the control variables, a number of observations can be made. Firstly, while population density does not affect local governments' productive efficiency, the significant negative sign on population suggests the presence of important diseconomies of scale. Secondly, debt and surplus affect productive efficiency in opposite ways, with debt adversely affecting efficiency and surplus increasing it – in line with expectations. Thirdly, the total tax burden is negatively related to productive efficiency, which suggests that larger governments are less efficient (for a similar finding on Norwegian municipalities, see Borge *et al*., 2008). Fourthly, income per capita is associated with lower levels of productive 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. Greater inequality also

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[13] Examination was made of different functional forms, notably logarithms. We only present results from the linear specification as these proved superior in terms of goodness-of-fit. Note also that when the government fragmentation variables are removed, competition's significance is increased (though the size of the effect remains roughly the same).

links to less productive efficiency, possibly reflecting competing requirements in such municipalities (Jottier *et al.*, 2012). Fifthly, while right-wing governments appear to be more efficient than left-wing governments, government fragmentation is associated with lower efficiency (in line with, for instance, Ashworth *et al.*, 2005; Le Maux *et al.*, 2011). Indeed, while governments with a larger majority (in terms of excess seats in the council) are linked to enhanced productive efficiency, taking into account the substantively much stronger negative effect of coalitions (NUMCOAL) implies that a 16-seat majority is needed to outweigh the negative effect on efficiency of a two-party coalition. In addition, a more fragmented opposition is associated with lower government efficiency, implying that a strong unified opposition forces the government to be productively efficient. Finally, at odds with expectations, grants appear to be positively related to municipal efficiency. This may imply that grants in Flanders are targeted correctly and improve incentives for the municipality, or that the Flemish (regional and provincial) government exercises a relatively strict control over local finances, such that inefficient spending (of, for example, grants) is less feasible. Future research should explore this issue further.

Regarding our central research question – i.e., does political competition improve productive efficiency? – it appears that increased *electoral* competition in terms of the number of parties contesting the election is related to greater efficiency. Similarly, *intertemporal* competition reflected in a politically more mobile electorate likewise engenders increased efficiency: i.e., whilst having relatively small coefficients, the volatility measures are statistically significant at conventional levels both under an unconstrained definition (using POLVOL in columns (2) to (6)) and when extreme volatility is factored out (using POLVOL-10 and DVOL10+ in columns (7) to (9)).[14] Note that while the former effect could potentially be affected by the reverse

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[14] When regressions are run using only those municipalities where POLVOL can be measured, there is a minimal change in the size of coefficients though no change of inference.

causation issue referred to above (i.e., lower productive efficiency generating more parties competing in the next election), this cannot be an explanation for the effect of political volatility since this is measured using historical data from the 1976-2000 period (see above).

One final note is in order: given the positive effect of political competition and the negative effect of government fragmentation, one might ask whether the competition effect outweighs the potential costs of increased government fragmentation. In all cases, the competition effects are stronger both in terms of their substantive size and in terms of statistical significance than the government fragmentation effects. Indeed, calculated at the averages, the competition effect of 0.206 is close to twice the weak-government counter-effect of 0.104. Given that the dependent variable lies between 0 and 1, this is a potentially sizeable effect.[15] As a consequence, it can be concluded that competition leads to improved government productive efficiency.

4. Conclusion

Competition leads to lower rent extraction in the private sector. That is, monopolies set their prices higher and their quantities lower than what would be the case under perfect competition – and pocket a profit (or monopoly rent) in the process. Political competition has been identified as a mechanism that disciplines the political leadership in much the same way. Politicians that do not face a credible threat of removal from office (i.e., lack political competitors) might feel more prone to serve narrow economic or selfish interests. They are held less accountable in the sense that they can do this without putting their re-election at risk.

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[15] In this consideration, we ignore the positive effect of 'excess seats'. One might, however, argue that larger majorities can be interpreted at least in part as reduced political competition (Holbrook and Van Dunk, 1993; Vanhanen, 2000; Ferris et al., 2008). Taking such effect into account, there would still be a beneficial effect for competition.

Testing this proposition on a dataset of 308 Flemish municipalities, we find considerable support. Electoral competition – measured in terms of the number of parties that participate in the election – has a significant positive effect on the productive efficiency of municipal policy. A second indicator of political competition – i.e., the volatility of election outcomes over time – suggests a similar positive, albeit substantively weaker, effect of competition on productive efficiency. 'Intertemporal' competition thus appears a weaker driving force of government efficiency compared to competition for office at a given election. While it should be noted that competition may lead to fragmented governments (which works against productive efficiency), the beneficial effects are found to outweigh the negative ones in our setting. Hence, we conclude that competition in the political arena appears to be force for productive efficiency.

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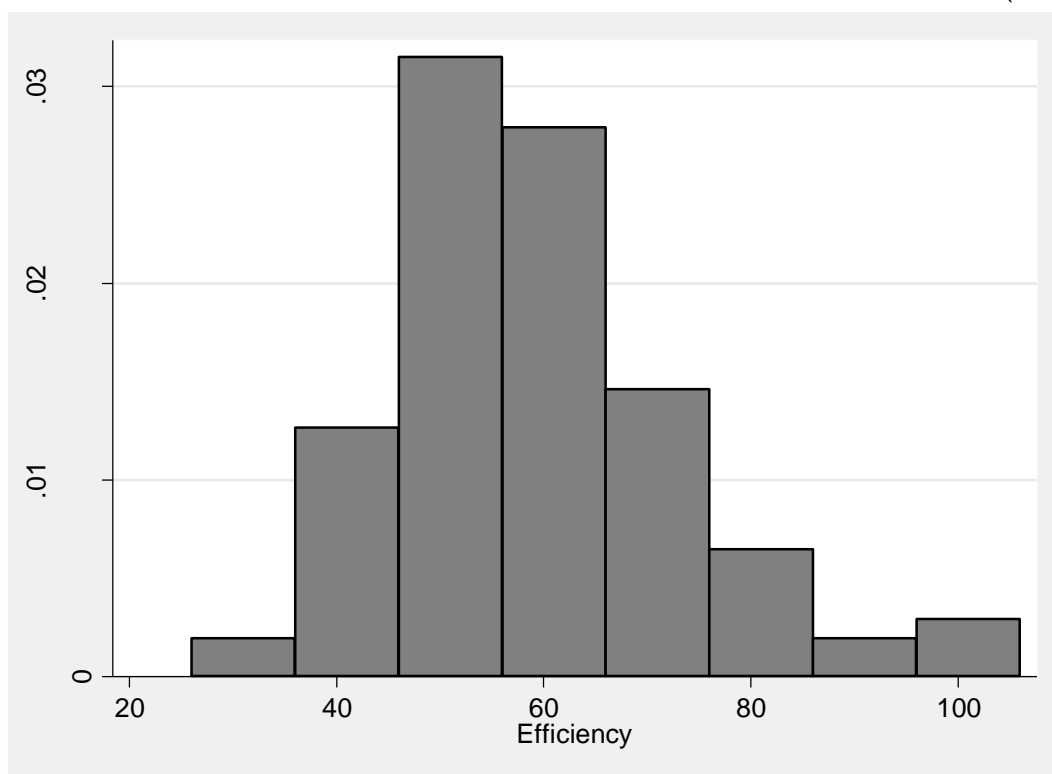
NON-PARAMETRIC BEST PRACTICE FRONTIERS WITH ONE INPUT (C) AND ONE OUTPUT (Y)
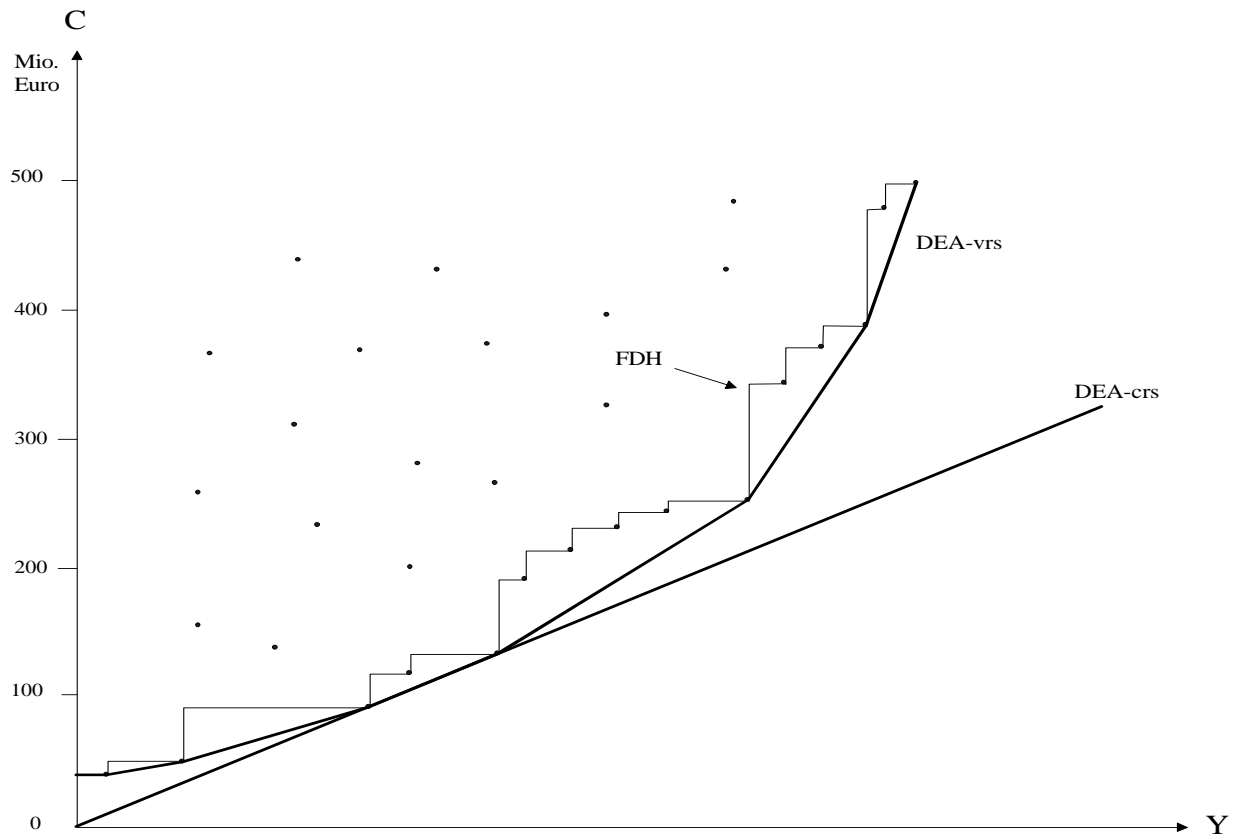
Source: Geys and Moesen (2009)

FIGURE 2:
GOVERNMENT PRODUCTIVE EFFICIENCY IN 308 FLEMISH MUNICIPALITIES (2010)

Source: Own calculations

TABLE 1
POLITICAL COMPETITION AND LOCAL GOVERNMENT EFFICIENCY (BIAS-ADJUSTED EFFICIENCY MEASURES)

Dependent Variable	Bias-Adjusted Dependent Variable	Boot-Strapped Confidence Intervals	Bias-Adjusted Dependent Variable	Bias-Adjusted Dependent Variable	Bias-Adjusted Dependent Variable	Bias-Adjusted Dependent Variable	Boot-Strapped Confidence Intervals	Bias-Adjusted Dependent Variable
Estimation	TRUNCATED	TRUNCATED	TRUNCATED	IVE	OLS	TRUNCATED	TRUNCATED	TRUNCATED
Independent Variables								
Intercept	0.805*** (0.092)	0.620, 0.959	0.801*** (0.091)	0.842*** (0.103)	0.867*** (0.088)	0.815*** (0.102)	0.629, 0.948	0.812*** (0.089)
ELPAR	0.035*** (0.011)	0.015, 0.047	0.035*** (0.011)	0.038*** (0.013)	0.041*** (0.011)	0.033*** (0.011)	0.012, 0.044	0.033*** (0.011)
POLVOL	0.0012** (0.0006)	0.0009, 0.0016	0.0012** (0.0005)	0.0012* (0.0007)	0.001** (0.0005)			
POLVOL-10%						0.003*** (0.001)	0.001, 0.004	0.003*** (0.001)
DVOL10+						-0.003 (0.043)	-0.014, 0.012	
SOLE	-0.014 (0.014)	-0.006, 0.008				-0.008 (0.013)	-0.003, 0.010	
NUMCOAL	-0.025* (0.015)	-0.045, 0.001	-0.026** (0.012)	-0.028** (0.015)	-0.027** (0.014)	-0.025* (0.014)	-0.043, 0.004	-0.026* (0.015)
EXCESS	0.003** (0.001)	0.001, 0.007	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.000, 0.007	0.003*** (0.001)
NUMOPP	-0.023* (0.014)	-0.046, -0.009	-0.025** (0.013)	-0.026** (0.014)	-0.025** (0.013)	-0.029** (0.013)	-0.050, -0.011	-0.029** (0.014)
IDEO	0.058*** (0.015)	0.032, 0.084	0.060*** (0.015)	0.054*** (0.019)	0.051*** (0.015)	0.057*** (0.016)	0.032, 0.082	0.058*** (0.016)
INCOME (x1000)	-0.012*** (0.004)	-0.017, -0.004	-0.012*** (0.004)	-0.012*** (0.005)	-0.012*** (0.004)	-0.011*** (0.004)	-0.017, -0.004	-0.011*** (0.004)
INEQ	-0.002** (0.0006)	-0.002, -0.001	-0.002** (0.0006)	-0.002* (0.0008)	-0.002** (0.0006)	-0.002** (0.0006)	-0.002, -0.001	-0.002** (0.0006)
POPULATION (/10^3)	-0.003*** (0.001)	-0.005, -0.002	-0.003*** (0.001)	-0.003*** (0.001)	-0.004*** (0.001)	-0.003*** (0.001)	-0.005, -0.002	-0.003*** (0.001)
SURPLUS (/10^8)	0.015* (0.008)	0.004, 0.035	0.015* (0.009)	0.015* (0.008)	0.015* (0.008)	0.015* (0.008)	0.002, 0.031	0.015* (0.008)
DEBT (/10^8)	-1.195** (0.610)	-0.257, -2.101	-1.175** (0.595)	-1.182** (0.601)	-1.144** (0.587)	-1.354** (0.602)	-0.326, -2.261	-1.340** (0.602)
TAXREV (/10^3)	-0.018*** (0.003)	-0.021, -0.014	-0.018*** (0.003)	-0.018*** (0.004)	-0.019*** (0.003)	-0.017*** (0.003)	-0.021, -0.013	-0.017*** (0.003)
DENS (/10^3)	0.015 (0.016)	-0.007, 0.045				0.005 (0.014)	-0.008, 0.043	
GRANTS (/10^8)	0.011*** (0.004)	0.006, 0.023	0.011*** (0.003)	0.012*** (0.004)	0.013*** (0.003)	0.011** (0.005)	0.005, 0.022	0.011** (0.005)
Sigma	0.087*** (0.004)	0.081, 0.093	0.091*** (0.004)			0.090*** (0.004)	0.086, 0.094	0.090*** (0.004)
Pseudo R²	0.474		0.443	0.412	0.422	0.492		0.486
Log-Likelihood	302.056		301.537	293.662	297.148	306.015		305.774
Diagnostic Tests								
NORMALITY	2.771		2.112	2.836	3.349	3.110		3.523
RESET²	1.428		1.572	1.364	0.997	0.772		0.836
RESET³	0.885		1.003	1.553	1.283	1.239		1.250
White Heteroscedasticity	10.221		8.997	11.137	14.223	15.223		12.976
Sargan				3.492				
Hausman (IV Exogeneity)				1.058				
INSIG			1.038 (2)	0.927 (2)	0.842 (2)			0.048 (3)

Notes: N=308; All estimations reflect truncated regressions except where indicated. Estimated standard errors in parentheses; *** significant at 1%, ** at 5% and * at 10%. 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 versions of the model (columns 2 and 7) and indicates omission of jointly insignificant variables; Pseudo R² is a measure as suggested by Veall and Zimmermann (1996), following Dhrymes (1986). Diagnostic tests are computed following Pagan and Vella (1989) and follow a t-distribution. The only exceptions are those for White unknown-form heteroscedasticity and normality, which are computed following Chesher and Irish (1987) and follow a χ² distribution.

DESCRIPTIVE STATISTICS (N=308; year 2000)

Variable	Mean	St. Dev.	Min	Max
Efficiency	58.72	14.08	26.09	100
ELPAR	5.16	1.74	2	13
POLVOL	20.93	10.51	0	65.48
POLVOL-10%	7.37	4.18	0	18.67
POLVOL-15%	10.34	5.05	0	24.07
POLVOL-20%	12.24	5.47	0	26.67
SOLE	0.39	0.48	0	1
NUMCOAL	1.75	0.74	1	5
EXCESS	10.17	9.35	0	47.83
NUMOPP	2.62	1.18	0	6
IDEO	5.01	0.58	2.7	6.1
INCOME (in 1000€)	11.13	1.47	7.40	15.77
INEQ	95.89	10.35	69.50	132.50
DENS (pop/km²)	511.22	443.08	51.06	3135.75
SURPLUS (per cap; in €)	7.15	8.78	-15.08	34.43
DEBT (per cap; in €)	1045.01	465.72	0	3404.22
TAXREV (per cap; in €)	426.38	187.64	65.74	2583.86
GRANTS (per cap; in €)	104.37	59.50	45.51	749.28

TABLE A2
POLITICAL COMPETITION AND LOCAL GOVERNMENT EFFICIENCY (INITIAL EFFICIENCY MEASURES)

Dependent Variable	Initial DEA Dependent Variable	Boot-Strapped Confidence Intervals	Initial DEA Dependent Variable	Initial DEA Dependent Variable	Initial DEA Dependent Variable	Initial DEA Dependent Variable	Boot-Strapped Confidence Intervals	Initial DEA Dependent Variable
Estimation	TRUNCATED	TRUNCATED	TRUNCATED	IVE	OLS			
Independent Variables								
Intercept	0.669 ***	0.504, 0.892	0.670 ***	0.754 ***	0.782 ***	0.668 ***	0.504, 0.887	0.670 ***
	(0.107)		(0.105)	(0.124)	(0.116)	(0.107)		(0.103)
ELPAR	0.029**	0.008, 0.053	0.029**	0.034**	0.037**	0.027**	0.005, 0.052	0.027**
	(0.012)		(0.012)	(0.016)	(0.014)	(0.012)		(0.012)
POLVOL	0.002**	0.001, 0.004	0.002**	0.002	0.002			
	(0.001)		(0.001)	(0.001)	(0.001)			
POLVOL-10%						0.003**	0.001, 0.005	0.004**
						(0.001)		(0.002)
DVOL10+						-0.013	-0.024, 0.012	
						(0.032)		
SOLE	-0.008	-0.037, 0.015				-0.006	-0.034, 0.019	
	(0.016)					(0.016)		
NUMCOAL	-0.022	-0.023, -0.000	-0.022	-0.032*	-0.033*	-0.022	-0.027, -0.001	-0.023
	(0.019)		(0.018)	(0.021)	(0.020)	(0.018)		(0.018)
EXCESS	0.002**	0.000, 0.006	0.002**	0.002*	0.002*	0.002**	-0.000, 0.006	0.002**
	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)		(0.001)
NUMOPP	-0.022*	-0.050, -0.003	-0.022*	-0.032*	-0.034*	-0.027*	-0.054, -0.004	-0.028*
	(0.015)		(0.015)	(0.017)	(0.017)	(0.015)		(0.015)
IDEO	0.045**	0.017, 0.081	0.047**	0.043**	0.041**	0.043**	0.016, 0.078	0.045**
	(0.018)		(0.018)	(0.021)	(0.020)	(0.018)		(0.018)
INCOME (x1000)	-0.009**	-0.018, -0.004	-0.009*	-0.009*	-0.009*	-0.008*	-0.017, -0.004	-0.008**
	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)		(0.004)
INEQ	-0.0012*	-0.003, -0.000	-0.0012*	-0.0015**	-0.0015**	-0.0012*	-0.003, -0.000	-0.0012*
	(0.0006)		(0.0007)	(0.0008)	(0.0007)	(0.0007)		(0.0007)
POPULATION (/10³)	-0.003***	-0.005, -0.001	-0.003***	-0.003***	-0.004***	-0.003***	-0.005, -0.001	-0.003***
	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)		(0.001)
SURPLUS (/10⁸)	0.014	0.001, 0.037	0.014	0.015*	0.014	0.012	-0.000, 0.034	0.012
	(0.010)		(0.010)	(0.008)	(0.010)	(0.010)		(0.010)
DEBT (/10⁸)	-0.786	-0.172, -1.946	-0.763	-1.216	-1.314*	-0.939	-0.201, -2.130	-0.924
	(0.699)		(0.699)	(0.724)	(0.776)	(0.694)		(0.694)
TAXREV (/10³)	-0.014***	-0.020, -0.009	-0.014***	-0.015***	-0.015***	-0.014***	-0.019, -0.009	-0.014***
	(0.003)		(0.003)	(0.004)	(0.003)	(0.003)		(0.003)
DENS (/10³)	0.009	-0.002, 0.038				0.007	-0.003, 0.030	
	(0.017)					(0.017)		
GRANTS (/10⁸)	0.011**	0.004, 0.022	0.011***	0.012***	0.013***	0.010**	0.002, 0.021	0.010**
	(0.004)		(0.004)	(0.004)	(0.004)	(0.004)		(0.004)
Sigma	0.110***	0.098, 0.113	0.110***			0.109***	0.098, 0.112	0.109***
	(0.004)		(0.004)			(0.004)		(0.004)
Pseudo R²	0.274		0.268	0.229	0.247	0.301		0.299
Log-Likelihood	237.161		236.913	211.161	211.161	240.163		240.0239
Diagnostic Tests								
NORMALITY	2.662		3.116	3.482	3.882	2.901		2.957
RESET²	1.886		1.900	1.752	1.520	1.311		1.273
RESET³	1.790		1.762	1.589	1.326	1.402		1.198
White Heteroscedasticity	15.901		16.336	17.448	14.930	12.342		15.206
Sargan				2.429				
Hausman (IV Exogeneity)				1.362				
INSIG (2) to (4)			0.496 (2)	0.483 (2)	0.572 (2)			0.278 (3)

Notes: N=308; All estimations reflect truncated regressions except where indicated. Estimated standard errors are in parentheses; *** significant at 1%, ** at 5% and * at 10%. 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 versions of the model (columns 2 and 7) and indicates an omission of jointly insignificant variables; Pseudo R² is a measure as suggested by Veall and Zimmermann (1996), following Dhrymes (1986). Diagnostic tests 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 χ² distribution.