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# Exploring Sources of Local Government Technical Inefficiency: Evidence from Flemish Municipalities

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ABSTRACT

**Exploring Sources of Local Government Technical Inefficiency: Evidence from Flemish Municipalities**

by Benny Geys and Wim Moesen

The present paper explores sources of technical (in)efficiency of Flemish municipalities in their production of local public goods (in the year 2000). In assessing inefficiency derivation, we focus on socio-economic and political characteristics of the municipalities as potential source. Our main findings indicate that while the socio-economic make-up of the population (i.c. income, income inequality, education and unemployment) appears to bear little relation to local (in)efficiency, the reverse holds for the municipal financial situation (i.c. grants, historical debt and fiscal surplus) as well as population size and density. Also, different types of communities – i.e. agricultural, residential, industrial, touristic or urbanised – are generally found to achieve comparable performance levels in providing 'core' public services. While indicative, the limitations of our dataset imply that further work is vital before definitive conclusions (as well as causal inferences) can be made.

*Keywords: Technical efficiency, government performance, Socio-economic typology, Flemish municipalities*

*JEL Classification: H11, H72, H21*

ZUSAMMENFASSUNG

**Ursachenforschung zur technischen Ineffizienz kommunaler Verwaltungen: Evidenz von flämischen Gemeindeverwaltungen**

Im vorliegenden Papier untersuchen wir anhand flämischer Gemeindeverwaltungen im Jahr 2002 die Ursachen von technischer Effizienz bzw. Ineffizienz in der Bereitstellung von lokalen öffentlichen Gütern. Als mögliche Quellen von Ineffizienz fokussieren wir in unserer Analyse auf sozioökonomische und politische Charakteristika der jeweiligen Gemeinden. Unsere Ergebnisse zeigen, dass die finanzielle Situation und die Einwohnerzahl und -dichte der Gemeinden (d.h. Subventionen, Altschuldenlasten, Haushaltsüberschüsse etc.) im Zusammenhang mit kommunaler (In)Effizienz stehen, während hingegen die Struktur der Bevölkerung in Hinblick auf sozioökonomische Charakteristika (z.B. Einkommen und deren Verteilung, Bildung und Arbeitslosigkeit) kaum einen Einfluss hat. Ebenso zeigen verschiedene Gemeindetypen (wir unterscheiden hier z.B. nach landwirtschaftlichen Gemeinden, Wohngegenden, Industriegebieten, touristisch erschlossenen und urbanisierten Gemeinden) ein vergleichbares Niveau in der Bereitstellung der wichtigsten öffentlichen Güter. Die Begrenztheit unserer Daten impliziert aber die Notwendigkeit weiterer Analysen bevor eindeutige Kausalitäten und Ergebnisse bestimmt werden können. Die vorliegende Arbeit bietet hierfür ein Beispiel und zeigt, wie eine solche Untersuchung gestaltet werden kann.

## Introduction

Although economic efficiency is only one among many public concerns (besides effectiveness, equity, responsiveness, adequateness, appropriateness, and so on; Dunn, 2004, 223-231), it has received increasing amounts of attention in recent years. One illustrative example concerns the performance evaluations central to the New Public Management (NPM) discussions since the late 1980s (Lindblad, 2006). Given this increased interest in and awareness of efficiency, there arises also a need to measure it and develop an understanding concerning the factors that affect (or influence) it. The present paper takes one step to address the latter question by analysing the variation of overall local government performance (via efficiency scores) across the Flemish municipalities in the year 2000.

Clearly, we are not the first to analyse local government efficiency.[1] The topic remains, however, of significant interest. For instance, in many countries there have been increased discussions concerning a further decentralisation of tasks from higher-level governments to the municipal level. However, while sub-national autonomy might well increase allocative efficiency (i.e. smaller jurisdictions with more homogeneous populations are often argued to be more capable of matching the provision of public goods with the preferences of their constituents; Musgrave 1959; Oates 1972, 1999; Tullock, 1969), theory is more prudent as regards its effect in terms of productive efficiency (which is the central topic of the present paper). In fact, a small scale of operation may be economically unviable due to, say, a lack of fiscal basis, the inability to exploit economies of scale or the absence of sufficient managerial competencies and experience among local staff. Hence, decentralisation should only be advocated when local governments are *more* (productively) efficient than higher-level governments. Second, and more specific to the Belgian setting, local governments have been confronted with increasing costs and decreasing revenues over the past decade (see section 2.1 for details). Both elements add pressure to local government's financial situation and, as raising revenues through taxation can be politically costly (e.g. Niskanen, 1979; Vermeir and Heyndels, 2006; Geys and Vermeir, 2008), increase the need for a more productive (or efficient) use of the available resources. Given these changing circumstances, a new look at local government performance and its determinants appears appropriate, if not overdue.

The empirical analysis explores the determinants of local government technical efficiency using data from 300 Flemish municipalities in the year 2000. While a wide range of socio-economic and political characteristics is incorporated, our focus lies on the relationship between the socio-economic typology of municipalities (i.e. agricultural, residential, industrial, touristic or urbanised) and their level of efficiency. This follows the suggestion made in Sampaio De Sousa and Stosic (2005, 177) that the "low efficiency score of some small [Brazilian] municipalities can be explained by the fact that they engage in tourism". Our results cannot confirm their proposition. Although tourist municipalities are indeed somewhat less efficient, the socio-economic typology of a municipality is generally *not significantly* related to the efficiency with

[1] Previous studies include Vanden Eeckaut *et al*. (1993), De Borger *et al*. (1994), De Borger and Kerstens, (1996), Sampaio De Sousa and Stosic (2005), Hindriks and Gerard (2005), Geys *et al*. (2008).

which this municipality provides its 'core' public services.[2] In line with previous research, our results confirm that the municipal population's income, income inequality, education, home-ownership and unemployment level are not related to municipal efficiency, while population size and density as well as the municipal financial situation (in terms of grant revenues and historical levels of debt) show a strong correlation with efficiency.

Section 1 introduces the methodological background for the measurement of government efficiency. Section 2 first presents the institutional context and dataset (i.e. Flemish municipalities in the year 2000), and then discusses our main findings. Section 3 concludes.

## 1. Measuring Government Efficiency: Methodology

Though different approaches to measure organisations' efficiency exist (for an overview, see Lovell, 1993), all entail two essential steps. First, a 'best practice frontier' is established connecting the input-output combinations where inputs are most productively used. Then, in a second step, deviations from this frontier are employed to determine the extent of (in)efficiency of input-output combinations not on this best practice frontier. Early contributions build on non-parametric approaches to construct the best practice frontier – i.e. Data Envelopment Analysis (DEA) and Free Disposal Hull (FDH) (e.g. Farrell, 1957; Deprins *et al*., 1984; Tulkens, 1993) – and designate *all* deviations from the frontier as inefficiency. As such deviations may also derive from, say, measurement errors or other stochastic influences, this may be inappropriate. Parametric approaches to efficiency measurement – developed by Aigner *et al*. (1977) and Meeusen and van den Broeck (1977) – do not suffer from this downside. They allow for a distinction between the effects of measurement error and inefficiency by introducing a composed error term in the parametric frontier equation. Dropping organisation subscripts for convenience, such a statistical model looks like:

$$\ln C = \alpha + \sum_{r=1}^{s} \beta_r \ln y_r + \tfrac{1}{2} \sum_{r=1}^{s} \sum_{q=1}^{s} \lambda_{rq} \ln y_r \ln y_q + \underbrace{v+u}_{=\varepsilon} \qquad (1)$$

where C designates the input indicator, y indicates the various output indicators, s points to the number of outputs used and $\beta_r$ and $\lambda_{rq}$ are parameters to be estimated. The composed error term ($\varepsilon$) consists of a symmetric component ($v$; assumed to be white noise) and a one-sided non-negative component ($u$) that represents inefficiency (such that $\varepsilon = v + u$). The latter component is generally assumed to have a half-normal or truncated normal distribution (cfr. De Borger and Kerstens, 1996; Méon and Weill, 2005) and to be independent from the former component. While estimation of equation (1) provides values for the composed error term ($v + u$), Jondrow *et al*. (1982) and Bauer (1983) show that, for any organisation i, the conditional distribution of $u_i$ given ($v_i + u_i$) contains all available information about $u_i$. Hence, this information can be used

[2] 'Core' public services refer to the provision of certain social, educational, infrastructure, environmental and recreational public goods Flemish municipalities are required – by federal and regional legislation – to provide. Municipal governments have to take up these tasks, while they can choose to engage in additional tasks such as, say, tourism (see also section 2.1 below).

to generate point estimates for the inefficiency component of any given decision-making unit i (see Jondrow *et al*., 1982; Bauer, 1983).[3]

One downside of equation (1) is that all municipalities are treated on the same footing. However, certain characteristics of a municipality may affect how successful the local government is in carrying out its tasks, even though it cannot affect these elements in the short (or even long) run (Battese and Coelli, 1995; Stevens, 2004). On obvious example of such exogenous (or non-discretionary) influences is the impact of geographic context. A municipality in a hilly region is likely to spend more on a given level of road infrastructure, but should therefore not be deemed less efficient in carrying out this task. Disregarding the effect of such background factors leads to an overestimation of government inefficiency. Fortunately, they can be taken into account by assuming that the inefficiency term ($u$) in the error of equation (1) is a function of a set of background variables (cf. Battese and Coelli, 1995). In other words, and as discussed in Coelli (1996, 7), $u$ is "assumed to be independently distributed as truncations at zero of the $N(m_{it}, \sigma_u^2)$ distribution where $m_{it} = \delta z_{it}$". In this extension, $z_{it}$ is a vector of background variables (for municipality $i$ and time period $t$) which are expected to influence (in)efficiency and $\delta$ is a vector of parameters estimating how the included background characteristics affect the jurisdiction's efficiency rating (for applications of this approach, see, e.g., Latruffe *et al*., 2004; Faria *et al*., 2005; Geys *et al*., 2008).[4] Hence, we come to the following modified model:

$$\ln C = \alpha + \sum_{r=1}^{s} \beta_r \ln y_r + \tfrac{1}{2} \sum_{r=1}^{s} \sum_{q=1}^{s} \lambda_{rq} \ln y_r \ln y_q + v + u \qquad (2)$$

$$u = \gamma + \sum_{i=1}^{I} \delta_i z_i + w \qquad (3)$$

where the error term of equation (3), $w$, is defined by the truncation of the normal distribution with zero mean and variance $\sigma^2$ (Battese and Coelli, 1995). The latter assumption assures that the inefficiency component $u$ can only take values bigger than or equal to zero.[5]

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[3] Constructing the best practice frontier based on the decision-making units at hand implies that ensuing efficiency measures are relative rather than absolute, and only have meaning in the specific sample employed.

[4] Assessing the impact of non-discretionary factors on efficiency is also possible through a two-stage approach (i.e. deriving efficiency estimates from equation (1) and using these as the dependent variable in a second regression with the variables in the $z_i$ vector as explanatory variables). Though well-established (see, e.g., Pitt and Lee, 1981; De Borger *et al*., 1994; Worthington, 1999), this approach may be inappropriate. The reason is that the measurement of efficiency in the first step assumes that the efficiency term in equation (1) is iid. However, recovering significant effects of background variables in the second step invalidates this assumption (see Kumbhakar *et al*., 1991; Reifschneider and Stevenson, 1991).

[5] As data limitations make complete coverage of all relevant output and background variables unattainable, we must be cautious in equating observed 'inefficiencies' with realizable cost savings. Nevertheless, even with incomplete coverage, $u$ and its determinants offer valuable insights into the characteristics that affect municipalities' (in)efficiency.

## 2. Local Government Efficiency in Flemish municipalities

### *2.1 Institutional context*

As in most West-European countries, Belgian – and therefore Flemish – municipalities have important responsibilities with respect to education, housing, health care, social welfare, recreation, infrastructure and the environment (including refuse collection) (John, 2001, 36). Still, while local governments have significant authority in *executing* these tasks, their *definition and aims* derive from federal and regional legislation. Hence, though article 162 of the Belgian Constitution explicitly states that municipalities can take initiatives that benefit their inhabitants and are in the communal interest, the same article also asserts that municipalities are subject to intervention from higher-level governments to prevent violations of the law or harm to the (broader) public interest. This places Belgium firmly in a "Southern-European", Napoleonic tradition where the central (and, in the case of Belgium, regional) government wields significant power (John, 2001, 34-39; Moesen, 2005).

This institutional setting is important since it has been frequently argued that decisions made by those at the top involve choices among values or goals, whereas decisions lower in the organization are largely devoid of such value content (see Simon, 1957; March and Simon, 1958). Hence, in systems that have traditionally been driven by the central government (such as Belgium), the work of local governments has much larger "factual" (or means-focused) content than "value" (or ends-focused) content. Local government work in Belgium thus can be best described as 'do-or-die' and is largely devoid of value choices (in contrast to, say, the US, where the value-component of local policy decisions is larger). This generates a situation that is particularly conducive to efficiency measurements (as the value-content or neutrality of the inputs and outputs then becomes less of an issue).

Importantly, the financial constraints within which Flemish municipalities are expected to execute their tasks have over the past decade tightened significantly, often as a consequence of regional and federal decisions (VVSG, 2004; Smolders and Goeminne, 2005; Dexia, 2006). Given that tax-increases are politically costly (see supra), these tightening financial constraints might increase local-level attention to and interest in increasing efficiency. While not an exhaustive list, we briefly discuss two (central) sources of local government revenues and one expenditure head that were strongly affected by recent legislative changes to illustrate the point.

- First, local governments in Belgium – and Flanders – raise tax revenues mainly via surcharges on residents' regional property and federal income tax bills (in 2002, these formed 43% and 39% of local tax revenues, or 22% and 20% of total revenues, respectively). In 1998, however, the Flemish regional government extended the exemption system for the regional property tax, which significantly lowered regional property tax revenues (VVSG, 2004). This reduced the tax base of the local surcharge and thus (in part) explains why local property tax revenues declined on average circa 7.5% over the period 1998-2000. In 2001, the federal government accepted a package of measures reducing personal income tax revenues by over 3 billion euro (Moesen and Stevens, 2003; Smolders and Goeminne, 2005; Dexia, 2006). The implied reduction in the local income tax base reduced

revenues from the local surcharge by roughly 11% (Smolders and Goeminne, 2005, 194-5) and was especially constraining in 2005-2006 (i.e. the years after the most important changes took effect) (VVSG, 2004; Dexia, 2006).

- EU directive 96/92 initiated the liberalisation of the European energy market. Following this directive, Flanders fully liberalised its gas and electricity markets in July 2003. This had strong financial repercussions on the Flemish municipalities since, up to that point, they received large dividends from their participation in (local monopolies organising) electricity and gas distribution. In 2000, these dividends represented on average 7.9% of local government revenues, but had reduced 66% by 2005 (Dexia, 2006, 43). Still, the drop in revenue was lower since the Belgian federal government partly compensated this loss.
- Belgian municipalities are responsibility for public safety via the local police. In 2002, the Belgian police services were, however, significantly reorganised by the federal government into an entity with two levels: i.e. one federal police corps and 196 local police zones. While the entire police force now works under federal regulations (Dexia, 2006), the municipalities remain responsible for organising and running the local police zones as well as for circa 60% of their funding (plus coverage of any potential financial deficit in their police zone) (Goeminne and Smolders, 2005; Dexia, 2006). The financial impact of this reorganisation on the municipalities was a hotly debated topic and recent studies indicate that municipalities on average saw their expenditures on the police force increase by 24.1% in 2002 (Goeminne and Smolders, 2005; see also Moesen and Stevens, 2003).

### *2.2 Description of data and variables*

We utilise data from 300 of the 308 Flemish municipal governments in the year 2000 (data unavailability precluding inclusion of the remaining eight municipalities). Local public goods provision is measured through five output variables (see Vanden Eeckaut *et al*., 1993; De Borger *et al*., 1994; De Borger and Kerstens, 1996): (a) the number of subsistence grants beneficiaries, (b) the number of students in local primary schools, (c) the size of public recreational facilities (in hectare), (d) the total length of municipal roads (in km) and (e) the share of municipal waste collected through door-to-door collections. These relate to important social, educational, recreational, infrastructural and environmental responsibilities of local governments.[6] More specifically, the number of subsistence grants beneficiaries and primary school students proxy the extent of social welfare and educational service provision. The size of public recreational facilities indicates the provision of recreational, leisure services. The length of municipal roads proxies the provision of local infrastructure and the share of waste collected indicates public environmental and ecological services. Clearly, none of these variables is a direct output measure and they are best seen as crude proxies for the level of public goods provision (De Borger *et al*., 1994; De Borger and Kerstens, 1996; Boyne, 2002). Therefore, as in previous work on local government efficiency, "outputs used are rather loosely related to the services delivered by municipal governments" (De

[6] They also constitute services municipalities are legally required to provide. Hence, the output-mix is restricted to services municipalities cannot opt out of (reducing worries that differences in observed (in)efficiency capture only differences in output-mix). We thank an anonymous referee for pointing this out.

Borger and Kerstens, 1996, 153-154). This, regrettably, reflects the general problem with defining and measuring public sector outputs (cf. Levitt and Joyce, 1987; De Borger and Kerstens, 1996).[7]

Our main input variable (C) equals current expenditures on those issues for which we observe government outputs. As such, we relate spending on a given number of services to spending *on these same services*. The reason for this choice is that it closely relates inputs (i.e. expenditures) to outputs (i.e. public services), thereby reducing worries that differences in observed (in)efficiency capture only differences in the output-mix. Alternatively, and as a robustness check, we estimate the model using total expenditures. Obviously, in this case, the municipality's output-mix choice plays a role (since municipalities might spend less on the outputs the analysis captures, and more on outputs that we cannot measure due to lack of data).

To measure the effect of exogenous (or non-discretionary) influences (i.e. $z_i$), we include a wide range of socio-economic and political variables. To start with the variable central to our analysis, we include the municipality's 'type'. Data regarding these types was taken from Dessoy (1998), who derived them by exploiting information on more than 100 morphologic and socio-economic variables describing Flemish municipalities (e.g. use of soil and buildings, income structure, economic activities, demographic structure and external/tourist appeal). Specifically, he first used factor analysis to reduce all this information into seven factors and, in a second step, used cluster analysis to determine which municipalities are 'closest' to each other in this seven-dimensional space (i.e. those for which the values for the seven factors have comparable values) (for details, see Dessoy, 1998). This two step process grouped municipalities in 'agricultural' (N=62), 'residential' (144), 'industrial' (65), 'urbanised' (21) and 'tourist' (8) municipalities. 'Agricultural' municipalities are characterised by an above-average agricultural sector and below-average demographic situation and socio-economic status of their inhabitants; 'residential' municipalities exhibit above-average wealth and demographic growth; 'industrial' municipalities combine a highly urbanised profile with above-average industrial activities and below-average third-sector activities; 'urbanised' municipalities stand out as highly urbanised and attractive to third-sector activities; 'tourist' municipalities show extreme levels of tourist appeal (and include only sea-side municipalities).

Sampaio de Sousa and Stosic (2005, 177) that the "low efficiency score of some small [Brazilian] municipalities can be explained by the fact that they engage in tourism". More generally, this suggests that the municipality's overall character might affect the way it is run. One possible reason could be that municipalities with, say, large agricultural or tourist activities face different constraints than, say, municipalities with a predominantly industrial or residential set-up. Also, they may have differences in needs and aspirations due to variations in population density, education level, preference structures and so on… This is likely to affect the decisions made by the local government, and (possibly) its technical efficiency. It is important to note, however, that the local governments' level of technical efficiency over time could affect the municipality's character. For example, more efficient governments may attract

[7] Unfortunately, information on output quality and input prices was not available. Panel data could admittedly help in resolving some of the problems related to these measurement issues. However, time series data were not available for several of our output variables which meant that this issue could not be addressed in the present analysis.

businesses or richer inhabitants and ultimately become more 'industrial' or 'residential'. The latter argument similarly implies the existence of a relation between municipal type and efficiency, but one running in the other direction (i.e. from efficiency to type). To assess the link between municipality type and local government technical efficiency, we include dummy variables for four of the municipal types distinguished (using urbanised municipalities as a reference category).[8]

To accurately capture the effect of municipal types and minimize the risk of missing variable bias, we control in the vector $z_i$ for a number of socio-economic and political elements that may affect municipal efficiency. Firstly, we include the per capita income level and the education level of the population (measured as the share of inhabitants over age 20 holding a university or college degree) based on the hypothesis that high-income or highly educated citizens might be "more effective in demanding more efficient government" (Knack, 2002, 777). We also include income inequality (measured by the interquartile difference divided by the median income; i.e. (Q3-Q1)/Median) to assess the effect of income heterogeneity, rather than just the income level in the municipality. Next, we include the unemployment rate. The effect of this variable is more ambiguous as it implies both higher spending on unemployment benefits (a '*cost effect*') and lower demand for public services (which increase with income levels) (a '*preference effect*') (Geys *et al*., 2008). We furthermore introduce population size (and its squared value) and population density (measured as the number of inhabitants per 100 square kilometres) to control for potential (dis)economies of scale. Then, we assess the effect of the large-scale municipal amalgamation operation in Belgium in 1976, by incorporating a variable equal to the number of pre-1977 communities that were united in one municipality in that year. As inhabitants may still identify with their 'historical' community within the current municipality (cf. Lago-Penas, 2004; Geys, 2006b), the ensuing 'intra-municipality' struggle may reduce overall efficiency. As a final socio-economic variable, the share of owner-occupiers is included. Local government policies influence housing prices (Oates, 1969; Reback, 2005). Hence, homeownership is likely to encourage citizens to insist on efficient government behaviour (Green and White, 1997; DiPasquale and Glaeser, 1999).[9]

Three further variables control for the overall financial situation of the municipality. Firstly, the lagged level of long-term local public debt (measured as a share of total municipal revenues) gauges the strain placed by past (investment) decisions on municipal finances. High interest and amortization repayments reduce the level of public goods provision possible with a given level of expenditures (making highly indebted municipalities appear less efficient in the current period). Secondly, the lagged level of the fiscal surplus (measured as a share of total municipal revenues) assesses the idea that bad financial management might be correlated with bad management in other

[8] Importantly, this modelling approach does not allow us to establish the direction of the causal relationship (rather than simply observe the inter-relation between both variables). One might argue that Instrumental Variables (IV) estimation should be considered in order to address this problem. The one-step procedure employed here, however, does not allow for the introduction of instrumental variables. Still, as the two-step approach mentioned above leads to biased inferences (see footnote 4), we believe the one-step procedure is nonetheless preferable. Obviously, no clear uni-directional 'causal' inference can therefore be drawn from the analysis.

[9] Data availability leads us to use 1991 data on the percentage of houses with a known resident that are occupied by the owner. Note that this time-lag mitigates against potential reverse causality problems that arise if citizens are more likely to buy (rather than rent) housing accommodation in efficiently run municipalities. We are grateful to Robert Nuscheler for this insight.

respects. Thirdly, the level of general purpose grants awarded to the municipality by higher level governments (measured as a share of total municipal revenues) addresses the hypothesis that politicians take less care in spending grant monies than in spending tax monies (Grossman *et al*., 1999).

Finally, we introduce the government's ideological position – defined as the weighed average ideological position of all government parties (with weights equal to party seat shares in the local government).[10] This builds on the idea that right-wing politicians generally more fiercely support the workings of the market, while left-wing politicians favour higher government intervention (see Hibbs, 1977; Tavares, 2004). It is not a priori clear, however, how these different preferences would translate into higher (or lower) efficiency. Note also that province dummies are included in all regressions to control for potential geographical patterns in the distribution of government efficiency (a view more extensively discussed – and supported – in Geys, 2006a and Revelli and Tovmo, 2007).

*2.3 Empirical Results*

The results of the model are presented in table 1. As we are mainly interested in the relation between local government (in)efficiency and the municipalities' background (or non-discretionary) variables, table 1 only presents the results from the inefficiency part of the equation (i.e. equation (3) above: $u = \gamma + \sum_{i=1}^{I} \delta_i z_i + w$).[11] Moreover, to simplify interpretation, we inverse all signs such that positive signs in table 1 indicate that the explanatory variable has a positive effect on municipal efficiency (rather than inefficiency). Readers should thus imagine -*u* (i.e. efficiency) rather than *u* itself (i.e. inefficiency) as the dependent variable in table 1. As discussed above, we provide results for two measures of municipal expenditures. The first, and most important, captures spending related to the five output variables in the model (results in columns (1) through (3)). The second equals total municipal spending (columns (4) through (6)). The latter results are mainly given for reasons of robustness and to illustrate the importance of accurately choosing inputs and outputs. In either case, three different specifications are given. Columns (1) and (4) present the 'base-line' model, while columns (2) and (5) and (3) and (6) add population concentration and homeownership respectively.

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Table 1

about here

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[10] The data concerning parties' ideological position are based on a self-placement survey among presidents and spokesmen of the parties in the municipalities – asking them to locate their party on a scale from 0 (extreme Left) to 10 (extreme Right) – and derive from Deschouwer (1996).

[11] Clearly, this presentational choice implies that the five output variables included in the model do not feature directly in the table. They are obviously used in the cost function equation to determine the inefficiency level (i.e. via equation (2) above), but, to keep the size of the table within reasonable limits, we do not report the exact results.

Starting with the variables central to our analysis, it can be seen from columns (1) through (3) that the type of municipality is at best weakly related to local government efficiency. None of the types behaves statistically significantly differently from the others. This suggests comparable performance across municipal types in providing 'core' public services. The latter finding is reassuring given that different choices in the output-mix over and beyond the 'core' services the municipalities are required to provide thus do *not* appear to affect the efficiency with which they provide these basic services. In sharp contrast to the results in the first three columns, however, we find strong and significant differences between municipal types once we use total spending as the primary input measure (see columns (4) through (6)). More specifically, compared to urbanised municipalities, agricultural, residential and industrial municipalities are found to perform better, tourist municipalities on average perform worse.[12] This difference in results is impressive, and of considerable interest. Indeed, as mentioned above, when using total spending the output-mix of the municipality plays a role in the analysis. Hence, the observed (in)efficiency differences in the last three columns probably reflect differences in output-mix rather than 'real' variations in efficiency, suggesting it is crucial to properly relate inputs to outputs to avoid incorrect inferences.

Casting a brief look at the remaining results, we observe that income, income inequality, unemployment, education, homeownership, government ideology and the number of pre-1976 municipalities do not significantly relate to local government (in)efficiency. Population, on the other hand, does. Larger municipalities tend be less efficient than smaller ones, *ceteris paribus*. This confirms the significant diseconomies of scale found by Vanden Eeckaut *et al*. (1993) using 1985 data in a sample of 235 Belgian municipalities. Interestingly, introduction of population concentration does not affect this result. Inclusion of this variable (see columns (2) and (5)) indicates that stronger concentration of inhabitants is significantly negatively related to efficiency. This supports the idea that the costs of public service provision may become more pronounced as population concentration rises (e.g. De Borger *et al*., 1990).

Finally, two of the three financial variables in the model have a significant relation to municipal efficiency ratings. Long-term local public debt is associated with lower efficiency. This suggests that high debt repayments impinge on municipal efficiency, even when it relates to provision of core public services. Moreover, and more surprising, we find that higher grants are related to *higher* efficiency ratings. This result is highly statistically significant and consistent over all our estimations. A similarly confounding result was retrieved for US cities by Grossman *et al*. (1999) and Australian local governments by Worthington (2000). It is, however, at odds with De Borger *et al*. (1994), who show that Belgian local government efficiency in 1985 is negatively related to the level of grants. One possible way to explain this divergence in results for the same country between 1985 and 2000 is that the grant system in Belgium was fundamentally changed in the late 1980's, also becoming a regional rather than federal

[12] In line with Sampaio De Sousa and Stosic (2005) for a sample of 4796 Brazilian municipalities, we find a consistent negative effect for tourist municipalities, which, importantly, fails to reach significance at conventional levels once we control for potential variation in the output-mix (i.e. columns (1) through (3)). Interestingly, their argument – i.e. that inefficiency may derive at least in part from underestimation of these municipalities' population size since "they tend to have a significant floating population" (De Sousa and Stosic, 2005, 177) – corresponds to our results. That is, the observed inefficiency of these municipalities in their study may simply be an 'artefact' due to insufficient control of municipal characteristics (or, as our results suggest, output-mix choices).

responsibility. Possibly, in the new system, transfers are linked with a stricter supervision of expenditures (reducing wasteful application of these resources). Alternatively, performance financing became more important and our results indicate that this shift from welfare financing to performance pay improved local government efficiency. These (highly) tentative explanations would, however, require more careful inspection and further research.

## 3. Conclusion and discussion

The aim of the current paper was to provide some initial steps to explore the sources of government (in)efficiency using data on Flemish municipal governments in the year 2000. While not extensively discussed, there is scope for efficiency improvement in 'core' public services in Flemish municipalities. A negativist interpretation of this would be that local governments suffer from considerable waste of resources or rent extraction by politicians. Still, given the existing – and mounting – pressures on local public finances in Flanders, there may be a more positive interpretation. In fact, at least part of these fiscal quandries can be confronted by making more efficient use of current resources. Given the inherent unpopularity of tax increases (Niskanen, 1979; Vermeir and Heyndels, 2006), local politicians may see this as a viable – and electorally more rewarding (or, at least, less intricate) – alternative.

Regarding the sources of variation in efficiency across the Flemish municipalities, we observe that previously obtained results largely hold: a) larger and more densely populated municipalities tend be less efficient (indicating that a significant part of the observed inefficiencies is driven by scale inefficiencies), b) socio-economic characteristics of the population (such as income, income inequality, unemployment, education and homeownership) have little relation to local government (in)efficiency, and c) grants have a strong and consistent relation to efficiency. Importantly, in Flanders, grants from higher level governments *positively* affect efficiency. This is confounding as one would expect that such resources would be used less efficiently (given that they are perceived to be less costly to the local community). While this finding may indicate that higher-level governments' grants in Flanders are linked to strict supervision on expenditures (reducing wasteful application of these resources), this is – at present – at best a tentative explanation requiring further analysis. A new result of the present study is that local government efficiency on 'core' public services is *not* related to municipal typology (i.e. agricultural, residential, industrial, touristic or urbanised). In fact, our results suggest that such differences, when observed, appear to derive mainly from the differences in the output-mix chosen by such municipalities. After controlling for output-mix differences (by restraining the analysis to a given set of outputs and their related spending levels), these differences disappear. This points to the crucial importance of adequately specifying inputs and outputs in the analysis to avoid erroneous inferences.

Given the importance of (local) government efficiency in the current political and economic landscape, the present exploration into the causes of variation in efficiency across municipalities should not be the end-point. Indeed, our dataset precluded an analysis into the causal nature of the processes observed (which would be a crucial issue to address in future research analysing time-series cross-section data). Also, it is worth delving further into what mechanisms trigger and/or explain the observed relationships: politics, resources, differences in tasks or workload?

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Table 1: Sources of efficiency in Flemish municipalities.

| Variable | Efficiency rating using Spending on Retained Outputs | | | Efficiency rating using Total Spending | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Intercept | -0.709 *** | -0.723 *** | -0.874 *** | 3.889 *** | 0.968 *** | 1.158 *** |
| | (-7.82) | (-2.28) | (-2.09) | (11.46) | (2.71) | (3.71) |
| Income | -0.017 | 0.001 | -0.015 | 0.014 | 0.010 | 0.014 |
| | (-0.86) | (0.02) | (-0.64) | (1.01) | (0.32) | (0.99) |
| Income inequality | 0.003 | 0.001 | 0.003 | 0.001 | -0.001 | 0.001 |
| | (1.11) | (0.45) | (1.00) | (0.59) | (-0.13) | (0.42) |
| Unemployment | -0.016 | 0.0001 | -0.014 | 0.013 | 0.026 | 0.011 |
| | (-1.02) | (0.001) | (-0.78) | (1.06) | (1.18) | (0.89) |
| Education | -0.002 | 0.001 | -0.002 | 0.001 | 0.005 | 0.001 |
| | (-0.39) | (0.24) | (-0.31) | (0.15) | (0.77) | (0.15) |
| Population | -0.046 *** | -0.040 *** | -0.046 *** | -0.059 *** | -0.014 *** | -0.059 *** |
| | (-10.87) | (-9.21) | (-10.48) | (-18.99) | (-5.16) | (-18.66) |
| Population squared | 0.0001 *** | 0.0001 *** | 0.0001 *** | 0.0001 *** | 0.0001 *** | 0.0001 *** |
| | (10.22) | (8.80) | (9.87) | (18.38) | (5.88) | (18.17) |
| Population concentration | - | -0.0002 *** | - | - | -0.0003 *** | - |
| | | (-2.52) | | | (-4.61) | |
| Homeowners | - | - | 0.001 | - | - | -0.0001 |
| | | | (0.41) | | | (-0.05) |
| Amalgamation | -0.012 | -0.015 | -0.012 | 0.001 | -0.004 | 0.001 |
| | (-1.58) | (-1.58) | (-1.30) | (0.11) | (-0.40) | (0.14) |
| Lagged public debt | -0.156 *** | -0.153 *** | -0.157 *** | -0.052 ** | -0.053 | -0.052 *** |
| | (-6.47) | (-5.41) | (-5.55) | (2.70) | (-1.27) | (2.83) |
| Lagged surplus | 0.0004 | -0.0001 | 0.0004 | 0.005 *** | 0.005 | 0.005 *** |
| | (0.17) | (-0.19) | (0.15) | (3.52) | (1.45) | (3.64) |
| Grants | 0.047 *** | 0.049 *** | 0.047 *** | 0.062 *** | 0.056 *** | 0.062 *** |
| | (7.62) | (7.71) | (7.29) | (12.25) | (7.83) | (12.43) |
| Ideological position | 0.001 | -0.007 | 0.003 | 0.011 | 0.002 | 0.011 |
| | (0.04) | (-0.26) | (0.15) | (0.71) | (0.07) | (0.75) |
| Agricultural municipalities [a] | -0.024 | -0.015 | -0.035 | 0.077 *** | -0.031 | 0.078 ** |
| | (-0.48) | (-0.24) | (-0.63) | (2.06) | (-0.46) | (2.22) |
| Residential municipalities [a] | 0.059 | 0.066 | 0.047 | 0.134 *** | 0.055 | 0.136 *** |
| | (1.42) | (1.22) | (0.90) | (4.08) | (0.88) | (4.27) |
| Industrial municipalities [a] | -0.011 | 0.016 | -0.013 | 0.178 *** | 0.069 | 0.181 *** |
| | (-0.18) | (0.21) | (-0.20) | (4.01) | (0.79) | (4.14) |
| Tourist municipalities [a] | -0.126 | -0.184 | -0.139 | -0.234 *** | -0.451 *** | -0.235 *** |
| | (1.35) | (1.41) | (1.32) | (3.20) | (3.33) | (-3.08) |
| Province dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| LL | 106.41 | 107.09 | 106.60 | 231.00 | 138.24 | 229.91 |
| LR one-sided error | 208.69 *** | 210.04 *** | 209.07 *** | 417.68 *** | 232.59 *** | 415.93 *** |

Note: N = 300; robust t-statistics in brackets; *** denotes significance at 1% level, ** at 5% and * at 10%; LL represent the loglikelihood of the model LR one-sided error assesses the null hypothesis of no inefficiencies against the alternative hypothesis that inefficiencies are present.

[a] Urbanised municipalities are the comparison group (designation based on Dessoy, 1998).