Expenditure and Taxation Effects of Local Public Debt and Unconditional Grants: Evidence from Flemish Municipalities

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Abstract

This paper studies the influence of local public debt and unconditional grants on a local government’s spending and taxing decisions. Assuming that current expenditure levels and tax rates are simultaneously determined, a three-equation econometric model is formulated and empirically estimated for all 308 Flemish municipalities. According to the empirical results, a large debt burden exerts a negative effect on local non-debt expenditures but it does not affect a local government’s taxing behaviour. Moreover, the analysis provides information on how municipalities adjust spending and local tax rates in response to increases as well as decreases in unconditional local grants. The budgetary response to grants-in-aid is found to be asymmetric.

Résumé

Cet article étudie l’influence des dettes publiques locales et des prêts non subordonnés sur les décisions des autorités locales en matière de décision de dépenses et de taxation. En supposant que les niveaux de dépenses et taux de taxation actuels sont simultanément déterminés, un modèle économétrique en trois équations est formulé et estimé pour l’ensemble des 308 communes flamandes. Les résultats empiriques indiquent qu’un endettement important exerce un effet négatif sur les dépenses locales non-dette mais n’affecte pas le comportement des gouvernements locaux en matière de dette. En outre, l’analyse fournit de l’information sur la manière dont les communes ajustent leurs dépenses et taux de taxation locaux en réponse à des augmentations et diminutions en matière de prêts locaux non subordonnés. La réponse budgétaire aux aides sous forme de prêts apparaît asymétrique.

* We thank S. Veris and G. Groffen for research assistance, and the Flemish Fund for Scientific Research for financial support. Thanks also to the Administration for Interior Affairs of the Flemish Community and to the administrative services of the five Flemish provinces for providing us with the necessary data. Finally, two referees provided most helpful comments, which are highly appreciated. The authors take full responsibility for remaining errors. Please send all correspondence to Bruno De Borger, University of Antwerp (UFSIA), Department of Economics, Prinsstraat 13, B-2000 Antwerp, Belgium. E-mail: Catholic University Leuven, CES, Naamsestraat 69, B-3000 Leuven. E-mail: Bruno.Deborger@econ.kuleuven.ac.be.
1. Introduction

Like in many other European countries, Belgian municipal governments accumulated substantial local debt over the past three decades. This was largely due to rapidly increasing costs of local public services and eroding tax bases, the latter as a consequence of the slowdown in economic growth. Not surprisingly, a number of policy measures were taken to tackle the problem of increasing local debt. These included a system of fiscal retrenchment loans, i.e., loans conditional on the submission and approval of a local retrenchment scheme, and widening the tax autonomy of local authorities by eliminating the existing limits on local tax rates. As of 1988, local governments were required to at least balance their (current) budget. This generally dampened the growth rates of local grants, and for at least some municipalities implied quite drastic changes in grant income.

The question arises as to how local authorities have reacted to pressures to reduce local debt and to changes in grant income. In this paper, we study the response of local authorities to severe pressures to reduce accumulated debts and to exogenous changes in grant income. More specifically, the paper has two objectives. First, we analyse the effect of local debt on current municipal spending and on the choice of local tax rates. A second objective is to study the reaction of local governments to positive and negative shocks in their grant income, taking into account the possibility of asymmetric responses. To analyse these questions we formulate and empirically estimate a simultaneous equation model with current municipal expenditures and local tax rates as endogenous variables. The empirical analysis uses data on all 308 Flemish municipalities.

Of course, both the determinants of local public expenditures and of the local tax structure have been intensively researched before. The seminal papers of Borcherding and Deacon (1972) and Bergstrom and Goodman (1973) have generated an impressive stream of empirical analyses of local public spending behaviour (see, e.g., Pommerehne and Schneider (1978); Reid (1991); Nath and Purohit (1992); Turnbull and Djoundourian (1994)). The policy relevance of identifying the precise impact of intergovernmental grants on local public expenditures has induced a vast literature on the 'flypaper effect'. A large number of potential explanations have been provided for the observation that an increase in unconditional grants causes a larger increase in local government expenditures than an equivalent change in private income, including fiscal illusion and political institutions, tax complexity, tax substitution, and econometric pitfalls in the modelling
procedure. The many empirical studies include Pommerehne and Schneider (1978), Romer and Rosenthal (1980), Fisher (1982), Megdal (1987), Becker (1994) and Heyndels and Smolders (1995). Moreover, a number of recent studies have focused on the possibility of asymmetric flypaper effects, with mixed empirical results (see, e.g. Gramlich (1987); Stine (1994); Gamkhar and Oates (1996); Heyndels and Van Driessche (1998)). Finally, optimal local tax policies have been studied by, e.g., Arnott and Grieson (1981), Hettich and Winer (1988) and Henderson (1994); a recent survey is provided by Inman and Rubinfeld (1996). Empirical analyses of local tax structures include White and Chou (1980), Hettich and Winer (1984), and Feenberg and Rosen (1987).

Despite this impressive list of studies, very few papers examine the joint impact of local public debt and grants in a simultaneous expenditure-taxation framework. It is clear that such an approach would be a welcome addition to the existing literature for several reasons. First, although a number of studies have analysed the effect of public debt on public expenditures (see, e.g., Roubini and Sachs (1989); Masson and Mussa (1995)), most of this literature focuses on the national level (for an exception see Bosch and Suarez-Pandiello (1995)). In this paper we therefore explicitly focus on the question as to how local policy-makers have realised the trade off between raising tax rates and cutting expenditures. Second, although there are some notable exceptions\(^1\), the above review indicates that at the local level much of the existing literature focuses on partial analyses of either the expenditure or the revenue side, but does not explicitly capture the interdependencies between spending and taxing in local decision-making. The consequence is that the impact of grants on expenditures has been intensively researched, but that relatively little is known about their effects on local tax decisions.

The decision to limit the empirical analysis to Flemish (and not using all Belgian) municipalities was deemed plausible given the constitutional revision of 1988, making municipalities dependent upon the regional governments. To put the analysis in perspective, it is instructive to present some stylised facts about the institutional structure and about the revenue and expenditure components of Flemish municipal accounts for 1994, the year to which our data refer. It follows from Table 1 that the cost of

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\(^1\) See, e.g., the detailed theoretical analysis in Hettich and Winer (1999), and the empirical studies of, among others, Islam and Choudhury (1989) and Gramlich (1987).
personnel is responsible for 47.4% of the total budget. Municipalities' debt service (interest payments and capital amortisation of outstanding debt) represents 22.8% of the total budget, operating costs and transfers have a share of 17.7% and 12.0% respectively. On the revenue side, taxes and lump-sum grants are the most important revenue sources. Tax income mainly stems from, on the one hand, additional taxes on the federal income tax and, on the other hand, regional property taxes². With respect to the former, municipalities can impose an additional percentage tax on the federal personal income tax. The federal government regulates the taxable amount, the exemptions and the progressiveness of the tax structure. In other words, municipalities' income tax revenues vary with federal income tax policy and with the general economic climate. The institutional setting for local property taxation is as follows. The regional government fixes a flat rate on the value of dwellings, industrial buildings, etc., where the criteria to establish imputed property values are set at the federal level. Regional authorities levy on this taxable base a small proportional tax. Municipalities finally fix their additional tax rate on the regional tax.

The lump sum grants received from the Flemish regional government yielded 21.6% of total municipal revenues in 1994. These unconditional grants are allocated on the basis of a detailed set of criteria including population size and density, the employment rate, etc. Moreover, they are inversely related to the tax capacity of the local personal income tax and the local property tax.

The structure of the paper is as follows. In section 2 we sketch a simple theoretical model that considers the effects local public debt and unconditional grants may have on spending and taxing decisions by local authorities. The model illustrates that, even in the absence of fiscal illusion, these effects are not unambiguous. In section 3 we then present the three-equation model that has been used to empirically study the impact of debt and grants. The endogenous variables are local current expenditures and the two most important local tax rates. Estimation results are reported in section 4. Finally, in section 5 we provide a summary of the most relevant findings.

² Definitely the manoeuvrability on the revenue side of municipal budgets is through the two additional tax rates previously described. Other exclusive municipal taxes (i.e. environmental taxes and user fees) represented only 18.1% of the tax revenue in 1994.
2. The impact of local debt on spending and taxing decisions: a simple theoretical model for the Flemish institutional environment

In this section we present a very simple analytical model to illustrate the effect of the size of local public debts on local public expenditure and tax decisions. The model is based on some strong assumptions, some of which do approximate current practice in the Flemish institutional environment. This will be made clear below. Other assumptions are made to simplify the exposition. For example, we focus on one tax source. Moreover, since the framework used is essentially static the model ignores the possibility of asymmetric grant responses. These restrictions will be relaxed in the empirical analysis.

Consider a local government that provides a local public good, which is financed by a lump-sum per capita tax and an exogenous unconditional grant from a higher-level authority\(^3\). Suppose the incumbent political coalition in a given municipality periodically decides on the level of the public good (Z) and the level of the lump-sum tax (T) by maximising the welfare of a representative voter. Utility of the latter is assumed to depend on the quantity of the public good and on his after-tax income \(X\), an approximation of his private expenditures (see, e.g. Nath and Purohit (1992); Stine (1994)):

\[ u = u(Z,X), \]

where \(X = y - T\), and \(y\) is the representative voter’s income.

Suppose the municipal government is required to balance its current budget, but that debt financing of investment expenditures is allowed. This is indeed the current practice in Flemish municipalities. Municipalities are required to balance current expenditures and revenues, but they are free to finance investment projects by contracting loans. In deciding over its present fiscal policy, the incumbent coalition will have to take into account the capital and interest payments that stem from the stock of debts determined by past investment decisions, possibly by previous political coalitions. Since the per capita amount of debt (\(\bar{S}\)), the pay-off rate (s) and the interest rate (i) are

\(^3\) The assumption of a lump-sum tax is made to ease the exposition. It does not substantially affect the qualitative results.
exogenous with respect to current decisions, the local governments’ budget constraint can be written as

\[ Z = T + \bar{G} - (i + s)\bar{S}, \]

where \( \bar{G} \) is the per capita amount of unconditional grants. The unit cost of the public good \( Z \) is normalised at one.

The constrained optimisation problem of the local government yields the following Langrangean:

\[ L = u(Z, y - T) + \lambda \left[ T + \bar{G} - (i + s)\bar{S} - Z \right], \]

where \( \lambda \) is the multiplier associated with the budget restriction. Not surprisingly, it immediately follows from the first-order conditions that optimal spending and taxing decisions must imply that the marginal rate of substitution between public and private consumption equals one. Moreover, the constrained maximisation problem yields the following system of fiscal policy equations:

\[ Z = Z(\bar{G}, \bar{S}, y, i, s, Q) \]
\[ T = T(\bar{G}, \bar{S}, y, i, s, Q) \]

where \( Q \) is a vector of demographic and other explanatory variables determining local preferences. Equations of this type are estimated in the empirical part of the paper.

To predict the effect of debt and grants on spending and tax decisions we differentiate the first-order conditions. The results can be written in matrix notation as follows:

\[
\begin{bmatrix}
u_{Z} & u_{ZT} & u_{TT} & -1 & \frac{dZ}{d\bar{S}} \\
u_{ZT} & u_{ZT} & u_{TT} & 1 & \frac{dT}{d\bar{S}} \\
-1 & 1 & 0 & 0 & \frac{d\lambda}{d\bar{S}}
\end{bmatrix}
\begin{bmatrix}
0 \\
0 \\
(i + s)d\bar{S} - d\bar{G}
\end{bmatrix}
\]

It is straightforward to show that the effects of local public debt \( \bar{S} \) and unconditional grants \( \bar{G} \) on local public expenditures \( Z \) and on the local tax \( T \) are given by the following expressions:

\[
\frac{dZ}{d\bar{S}} = \frac{(i + s)(u_{ZT} + u_{TT})}{u_{Z} + 2u_{ZT} + u_{TT}} \quad \frac{dT}{d\bar{S}} = \frac{(i + s)(u_{ZT} + u_{ZZ})}{u_{Z} + 2u_{ZT} + u_{TT}}
\]

\[
\frac{dZ}{d\bar{G}} = \frac{(u_{ZT} + u_{TT})}{u_{Z} + 2u_{ZT} + u_{TT}} \quad \frac{dT}{d\bar{G}} = -\frac{(u_{ZT} + u_{ZZ})}{u_{Z} + 2u_{ZT} + u_{TT}}
\]
A sufficient second order condition for optimisation is that the determinant of the bordered Hessian is positive, implying \((u_{zz} + 2u_{zt} + u_{tt}) < 0\). Moreover, \(u_{zt}\) and \(u_{zz}\) are plausibly negative because of declining marginal utility. Therefore, the sign of the different effects will strongly depend on the sign and magnitude of \(u_{zt}\).

As long as \(u_{zt} < 0\) the numerators of all four expressions are negative. This is the case if the representative individual’s marginal utility of private goods rises with the availability of public provisions. Under those conditions an increase in local public debt will have a negative effect on local non-debt expenditures while having the opposite effect on the local tax rate. The joint impact implies an automatic tendency to reduce debts. Similarly, an increase in unconditional grants causes public expenditures to be increased and the tax rate to be cut.

It is clear that two other alternative outcomes are at least theoretically possible if \(u_{zt}\) is positive. First, if \(u_{zt} > |u_{tt}|\) and \(u_{zt} < |u_{zz}|\) then local debt has a positive effect on tax income as well as on non-debt public expenditures. In other words, a debt increase induces the municipal government to raise both spending and taxes, but the positive effect on tax income surpasses the corresponding effect on non-debt public expenditures. Intuitively, the reason is that the tax increases the marginal utility of additional public spending more than it reduces the marginal utility of private spending. Second, if \(u_{zt} < |u_{tt}|\) and \(u_{zt} > |u_{zz}|\) then local debt has a negative effect on tax income as well as on non-debt public expenditures. To compensate the loss in public revenues and in order to be able to pay off some of the debts at the same time, the local government cuts spending by an amount that surpasses the tax-cut. This situation arises because the tax reduction reduces the marginal utility of public spending less than it increases the marginal utility of private consumption.

Using the same arguments we observe that local governments may react to increasing unconditional grants in three different ways: by reducing taxes and increasing spending, by cutting lump sum taxes as well as local public expenditures, or by raising both taxes and spending. Note that this latter possibility (a positive effect on both local public expenditures and local tax rates) is obtained even in the absence of fiscal illusion. Of course, the presence of fiscal illusion does provide an alternative or complementary explanation for this phenomenon. If increasing local expenditures result in more public services provided, voters might interpret this as a real fall in the
(tax) prices of public goods, which reduces the political cost of raising taxes (Stine (1994)).

3. The empirical model

The model of the previous section has shown that the impact of local debt and unconditional grants for taxing and spending decisions is not unambiguous. Therefore, in a more realistic setting the sign and magnitude of the relevant effect is definitely an empirical matter. In this section we investigate the impact of grants and debt using cross-section data of all 308 municipalities in Flanders.

The empirical model differs from the theoretical version presented in the previous section on two accounts. First, it takes into account the existence of both income and property taxes as important tax revenue sources. A simultaneous system of structural equations is estimated that treats local non-debt expenditure and the two relevant local tax rates as endogenous variables. The set of explanatory variables includes, apart from local debt and unconditional grants, a set of demographic and socio-economic determinants of local preferences. Second, it allows for the possibility of asymmetric responses to grant increases and decreases, as suggested in recent empirical literature (Gamkhar and Oates (1996); Stine (1994)). Specifically, the empirical model is formulated as

\[
\begin{align*}
NDEBTEXP &= \alpha_1 + \beta_1 DEBT + \sigma_1 GRANT + \delta_1 GRANT + \varphi_1 Q + \varepsilon_1 \\
PTAXINC &= \alpha_2 + \beta_2 DEBT + \sigma_2 GRANT + \delta_2 GRANT + \varphi_2 Q + \varepsilon_2 \\
ITAXINC &= \alpha_3 + \beta_3 DEBT + \sigma_3 GRANT + \delta_3 GRANT + \varphi_3 Q + \varepsilon_3
\end{align*}
\]

where \( Q \) is a vector of demographic and socio-economic variables. The definition of the other variables is the following. First, the endogenous variables \( NDEBTEXP, \) ITAXRATE and \( PTAXRATE \) are the per capita current non-debt expenditures (excluding interest and capital payments), the income tax rate and the property tax rate, respectively. As stated in the introduction, ITAXRATE is the municipal additional tax (a percentage) on the federal income tax. The average value of ITAXRATE in the sample is 6.7 %. Similarly, the local property income tax rate \( PTAXRATE \) is an additional tax on the Flemish real estate tax. The regional property tax is a flat rate of 2.5 % of the imputed value of the immovable property, to which municipalities apply \( PTAXRATE \) to generate property tax income. The average value of \( PTAXRATE \) in the sample is 9.69. The meaning of this
figure is the following: an implicit tax rate of \((9.69 \times 2.5)\%\) is paid on average on the imputed annual property income ('kadastraal inkomen').

The explanatory variables included in the model can be summarised easily. To capture the effect of local debt we use the local government's debt-ratio (DEBT), i.e. the total amount of outstanding municipal debt as a fraction of total municipal revenues (see, e.g., Kirchgässner and Pommerehne (1995)). This debt-ratio can be interpreted, ceteris paribus, as the number of years a local government eliminate accumulated debts completely. The effect of unconditional grants is captured by including the variable GRANTS, defined as the unconditional grants per capita, in the expenditure and tax equations. In our sample of Flemish municipalities about 21% of current revenues come from unconditional grants\(^4\).

Gramlich (1987) was the first to point at the possibility of asymmetric reactions to changes in grant income. He found that local governments did not reduce expenditure levels as a reaction to lower grant income, as predicted by the 'traditional' flypaper effect. Instead, local governments were seen to compensate the revenues lost by increasing their own revenues in order to be able to maintain the initial level of expenditures. Although there is no general agreement on the empirical relevance of asymmetric flypaper effects (see, e.g., Gamkhar and Oates (1996)), to allow for the possibility of asymmetric reactions we introduced the variable DGRANT defined as

\[
\text{DGRANT} = D \times (\text{GRANT}_{94} - \text{GRANT}_{88}),
\]

where \(D\) is a dummy variable that takes the value 1 if a municipality's per capita grant revenue in constant 1988 prices decreased over the period 1988-1994. Although detecting asymmetric flypaper effects in a pure cross-section is difficult, a significant coefficient for DGRANT would be consistent with such an effect. It is not an easy task, however, to state hypotheses about the sign of DGRANT in the three budgetary policy equations. According to Gramlich's "fiscal replacement" form of asymmetry, negative coefficient estimates will be observed in the expenditure equation as well as in the tax rate equations. However, based on empirical evidence from Pennsylvania county governments, Stine (1994) observed a "fiscal restraint" form of asymmetric reaction in which declining

\(^4\) The latest major reform of the unconditional grants system dates from 1990.
federal aid resulted in a propensity to lower own source revenues (i.e. local tax-revenue). In this case, a positive sign would be expected in both the expenditure and tax rate equations.

Ever since the seminal paper by Bergstrom and Goodman (1973), it has become common practice in models of local expenditures to add a set of socio-economic, demographic and budgetary characteristics (summarised by Q in the specification given above). These should control for intermunicipal differences in preferences for local public services, capture variations in cost conditions, and reflect differences in revenue-generating characteristics between local governments (see, Schwab and Oates (1991); Islam and Choudhury (1989)). We briefly review the variables introduced in the empirical model.

- **proxies for the relevant tax bases**: two variables were introduced, viz. taxable personal income per capita (ITAXINC) and the per capita property income in the municipality (PTAXINC). The former variable is used as a proxy for the tax base of the local personal income tax, the latter as a proxy for the tax base of the local property income tax. Since public goods are considered as normal goods the coefficient estimates of the income variables in the expenditure equation are expected to be positive. The coefficients in the tax rate equations are expected to be negative.

- **demographic and socio-economic variables**: By including the percentage of residents younger than 19 (YOUNG) and older than 65 (OLD) we take account of the particular demographic situation in each locality. Socio-economic characteristics are captured by the percentage of residents that are unemployed (UNEMP) and by a ‘centrality index’ (EMPRES) for the active population\(^5\). This variable has been introduced to control for the important geographical spillover effects that stem from the central location of a municipality.

- **dummy variable**: a dummy variable (COAST) was introduced that takes the value 1 if the municipality is located at the seaside. Because of their tourist function these municipalities are known to have a pattern of expenditures different from other municipalities (see Moesen and Vanneste (1990)).

\(^5\) EMPRES is calculated as the number of people (residents and non-residents) that are employed in the locality relative to the number of local residents.
**revenue structure variable**: TAXDEP indicates the extent to which a local government is dependent upon tax income to finance its expenditures. This variable is expected to generate a negative effect on public expenditures. Indeed, it is supposed that a local government that is highly dependent on tax revenues is more reluctant to expand its budget.

**fiscal illusion variable**: The Hirschman-Herfindahl Index (HHI), as an index of the complexity of a municipality’s tax structure, measures the effect of fiscal illusion. The index is calculated as the sum of squared shares of the individual tax items $t_i$ in the total local tax revenues $HHI = \sum t_i^2$. By definition, the HHI takes a value between 0 and 1. The index will take its maximum value for a municipality relying on just one tax source. Its value decreases as the municipality raises tax revenues from more tax bases that take a small proportion in total tax income. Thus, a complex tax structure is associated with a relatively low value of the HHI. We expect the estimated coefficient to have a negative sign in the expenditure equation. Indeed, revenue-complexity resulting from the fragmentation of the revenue system is expected to give rise to fiscal illusion. Fiscal illusion causes voters to underestimate the tax-price of public goods. This results in an excess demand of local public goods (Dollery (1996)). The sign of the coefficient estimated in the tax rate equations could go either way. First, a negative sign may be observed when fiscal illusion reduces the political cost of raising tax rates as stated by Wagner (1976) and Pommerehne (1978). Second, if the number of tax sources for raising a fixed amount of tax revenue is increased, the tax rate of a particular tax may be cut. If so, a positive sign will be observed.

The effect of debt and unconditional grants on the per capita non-debt local expenditures and the local tax rates is estimated in a simultaneous equation framework using SUR. The data are drawn from the 1994 accounts of all 308 Flemish municipalities. Some summary statistical information on the variables is provided in Table 2.

4. **Empirical results**

The estimated coefficients of the three equation system are presented in Table 3 (t-values in parentheses). The overall results are reasonable. Many coefficients are significant and the explanatory power, although much lower for the tax equations than for the expenditure equation, is quite acceptable.
Turning to the results we initially focus on the implications of high-accumulated debts. Observe that the coefficient estimate of the debt ratio (DEBT) in the equation of the non-debt public expenditures is significantly negative. Although this seems quite plausible, it must be noted that this result does not confirm Bosch and Suarez-Pandiello (1995); they found local public debt to have a stimulating effect on local non-debt expenditures. On the other hand, DEBT does not generate a significant effect on a local government's taxation behaviour. The coefficients in the tax rate equations are positive for the income tax and negative for the property tax, but neither is significantly different from zero. In other words, the estimates suggest that local governments tend to alleviate their debt burden by cutting expenditures and not by raising taxes. Apparently, the political cost of raising taxes is higher than the political cost of reducing the level of local public services. Note that these results are in line with the analysis of Alesina and Perotti (1995) at the national level. They prove that fiscal adjustment can only be successful if it does not raise taxes but rather cuts public expenditures.

In line with a priori expectations, unconditional grants are observed to have an expansive effect on local expenditures. Note, however, that unconditional grants are also estimated to have positive and significant effects on both the income and the property tax rate. There are at least three possible explanations for this finding. First, it may simply reflect the structure of local preferences, as stressed in Section 2. Second, the fiscal illusion argument given before can be restated so as to fit the observed fiscal effects of GRANTS. Unconditional grants obscure the true tax price of local public goods and services. In particular, an increase in a local government's grant revenue fosters the illusion that there has been a reduction in the marginal tax price of the local public provisions, thus reducing the political cost of raising local tax rates. In this situation, the political agents have an incentive to increase the budget by providing the output demanded by the community at a higher cost than necessary (see Mueller (1995)). This explanation is supported by De Borger and Kerstens (1996), who found that grants not only encourage local service provision but also stimulate inefficiency. Third, block grant schemes are often designed by the central government to equalise the fiscal capacity of localities. High grant revenues can then be seen to reflect a locality's low fiscal capacity. In this case, the observed positive effect of grants on the local tax rates may be an indication that the existing block grant scheme does not fully succeed in attaining its equalising goal. In this scenario local governments who receive high grant revenues
will be seen not to reduce their local taxpayers’ tax bills simply because they are in need of the ‘extra’ financial means: grant revenues of municipalities receiving high grants are yet not sufficient⁶.

The estimated coefficient of \text{DGRANT} is significantly different from zero in the expenditure equation as well as in the tax rate equations. Our results thus support the asymmetric flypaper hypothesis, confirming results of Heyndels and Van Driessche (1998) who did find an asymmetric flypaper effect in a model focusing on local public expenditures only. Surprisingly, however, it is found that decreasing grant revenue exerts a negative impact on local tax rates but that at the same time it stimulates local expenditures. In other words, the evidence is consistent with a strong form of the fiscal replacement (Gramlich (1987)) hypothesis in which declining grants induce local authorities to look for other sources of revenue.

The coefficient estimates of the income variables indicate that, on average, local public spending tends to be higher in ‘rich’ localities while local tax rates are lower. These results confirm the empirical findings of Pommerene and Schneider (1978) and, for Belgium, Heyndels and Vuchelen (1996). Moreover, note that the expansive impact of grants on the local non-debt expenditures is much stronger than the expansive impact of personal income, confirming the standard flypaper hypothesis (Fisher (1982); Megdal (1987)).

As predicted, the tax-dependency variable generates a negative sign in the expenditure equation. In other words, local governments will be more reluctant to expand their budget in case the financial means to do so have to be raised from taxation. The positive sign of the estimated coefficients of \text{TAXDEP} in the tax rate equations confirms our expectations as well. A local government that is more dependent on taxes will (have to), ceteris paribus, set higher tax rates.

Both demographic variables, \text{YOUNG} and \text{OLD}, exercise a negative effect on non-debt local expenditures while having a positive effect on the local tax rates. The percentage of unemployed residents is observed to exercise a positive effect on the local tax rates. As expected, the centrality index

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⁶ Still another explanation might be that grant revenue itself depends on local tax efforts. In that case the positive effect of grants on tax rates would simply be an institutional artifact (see Bosch and Suarez-Pandiello, (1995)). The institutional framework in Flanders, however, does not provide a criterion that makes intergovernmental grant revenues dependent on the fiscal efforts of the local governments.
(EMPRES) exerts a positive effect, significant at the 1% level, on the local non-debt expenditures.

The observation that coastal municipalities have higher non-debt expenditures than do non-coastal municipalities confirms the results of earlier research (Moesen and Vanneste (1990)). It appears, however, that the extra public expenditures are not financed by imposing higher personal- or property income tax rates. Indeed, the sign of the coefficient estimate of the dummy COAST is negative in both tax rate equations. A plausible explanation is that 'coast' municipalities can shift taxes to non-residents via the second home tax and the property tax on these residences.

The estimated coefficients of the Hirschman-Herfindahl Index have a negative sign in the expenditure equation as well as in the tax rate equations. These results confirm the findings of Dolly and Worthington (1995) and Hettich and Winer (1999). A more complex tax structure leads to a larger public sector by obscuring the true tax-price of public services, thus reducing the political cost of raising tax revenues.

5. Summary and policy conclusions

This paper has studied the effect of local debt and unconditional grants on local expenditure and tax policy. A simultaneous equation model has been estimated that treated local spending and two important tax rates as endogenous dependent variables. The set of explanatory variables included, apart from local debt and unconditional grants, a set of demographic and socio-economic determinants of local preferences.

The estimation results can be summarised as follows. First, variations in municipal budgetary policy patterns can be explained in a satisfactory way using the empirical model tested in the preceding section. Second, local debt and intergovernmental grants have an important impact on a local governments’ budgetary policy. More specifically, the results suggested that the local debt ratio exerted a negative effect on non-debt local expenditures whereas it did not significantly affect the most important local tax rates. Local governments tend to alleviate their debt-burden by cutting expenditures and not by raising taxes. Third, the results supported the idea of an asymmetric flypaper effect associated with changes in unconditional grants in the sense that local authorities react asymmetrically to increases and reductions of grants. Fourth, we found some support for the hypothesis that local governments will be more reluctant to expand their budget in case the financial means to do so have to be raised through additional local taxes.
Finally, a complex tax-structure was estimated to have an expansive effect on local non-debt expenditures. This observation has been attributed to fiscal illusion. In other words, a complex tax-structure tends to obscure the true cost of public services.

To the extent that the results reflect revealed municipal behaviour we can infer at least two tentative policy recommendations. First, investment decisions, and subsequent debt accumulation, of local governments should be closely monitored by the Flemish regional authority. Indeed, the debt-ratio significantly reduces non-debt expenditures, implying that ‘service levels’ of municipalities could be at risk whenever ‘over’ investment occurs. Secondly, the asymmetric flypaper effect suggests that increasing unconditional grants is probably not an appropriate response to municipalities in fiscal distress.

References


**Table 1. Revenue and Expenditure of Flemish municipalities (budget 1994)**

<table>
<thead>
<tr>
<th>Revenue</th>
<th>%</th>
<th>Expenditure</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grants</td>
<td>21.6</td>
<td>Personnel</td>
<td>47.4</td>
</tr>
<tr>
<td>Taxes</td>
<td>42.9</td>
<td>Operating costs</td>
<td>17.7</td>
</tr>
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<td>Trade, Agriculture, Industry</td>
<td>11.1</td>
<td>Transfers</td>
<td>12.0</td>
</tr>
<tr>
<td>Education</td>
<td>10.1</td>
<td>Debt service</td>
<td>22.8</td>
</tr>
<tr>
<td>Others</td>
<td>14.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Some statistical information on the variables

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>MEAN</th>
<th>MAXIMUM</th>
<th>MINIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDEBTEXP¹</td>
<td>19,823 BEF</td>
<td>58,115 BEF</td>
<td>10,312 BEF</td>
</tr>
<tr>
<td>ITAXRATE¹</td>
<td>6.67 %</td>
<td>9.00 %</td>
<td>0.00 %</td>
</tr>
<tr>
<td>PTAXRATE¹</td>
<td>9.69</td>
<td>19.10</td>
<td>2.60</td>
</tr>
<tr>
<td>DEBT¹</td>
<td>1.019</td>
<td>2.37</td>
<td>0.00</td>
</tr>
<tr>
<td>GRANT¹</td>
<td>3,667 BEF</td>
<td>25,839 BEF</td>
<td>1,943 BEF</td>
</tr>
<tr>
<td>DGRANT¹</td>
<td>-154 BEF</td>
<td>0.00 BEF</td>
<td>-965 BEF</td>
</tr>
<tr>
<td>ITAXINC²</td>
<td>357,845 BEF</td>
<td>515,000 BEF</td>
<td>244,200 BEF</td>
</tr>
<tr>
<td>PTAXINC²</td>
<td>20,408 BEF</td>
<td>55,194 BEF</td>
<td>7,015 BEF</td>
</tr>
<tr>
<td>TAXDEP¹</td>
<td>47.84 %</td>
<td>77.35 %</td>
<td>8.65 %</td>
</tr>
<tr>
<td>YOUNG³</td>
<td>24.62 %</td>
<td>32.10 %</td>
<td>19.31 %</td>
</tr>
<tr>
<td>OLD³</td>
<td>14.55 %</td>
<td>22.07 %</td>
<td>7.38 %</td>
</tr>
<tr>
<td>UNEMP⁴</td>
<td>3.69 %</td>
<td>8.13 %</td>
<td>1.46 %</td>
</tr>
<tr>
<td>EMPRES⁴</td>
<td>0.37</td>
<td>2.38</td>
<td>0.09</td>
</tr>
<tr>
<td>COAST</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HHI¹</td>
<td>0.37</td>
<td>0.84</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Source:
¹ 1994 municipal budgets
² 1994 fiscal and financial statistics
³ 1993 population statistics
⁴ 1994 employment statistics

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7 See the main text for the exact definition of PTAXRATE: it is the additional tax coefficient applied to the flat rate of 2.5% imposed by the Flemish regional authority. Multiplying PTAXRATE by 2.5% gives the implied tax rate on imputed property income ('kadastraal inkomen').
Table 3. SUR estimation of the per capita non-debt local expenditures, the local personal income tax rate and the local property income tax rate (1994)

<table>
<thead>
<tr>
<th></th>
<th>NDEBTEXP</th>
<th>ITAXRATE</th>
<th>PTAXRATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>42027**</td>
<td>4.5307**</td>
<td>-863*</td>
</tr>
<tr>
<td></td>
<td>(6.43)</td>
<td>(2.46)</td>
<td>(-2.11)</td>
</tr>
<tr>
<td>DEBT</td>
<td>-3264**</td>
<td>0.0513</td>
<td>-51.80</td>
</tr>
<tr>
<td></td>
<td>(-5.78)</td>
<td>(0.32)</td>
<td>(-1.46)</td>
</tr>
<tr>
<td>GRANT</td>
<td>1.368**</td>
<td>7.85 E-05*</td>
<td>0.0249**</td>
</tr>
<tr>
<td></td>
<td>(11.24)</td>
<td>(2.29)</td>
<td>(3.72)</td>
</tr>
<tr>
<td>DGRANT</td>
<td>-4.733**</td>
<td>0.0014**</td>
<td>0.2512**</td>
</tr>
<tr>
<td></td>
<td>(-4.55)</td>
<td>(4.73)</td>
<td>(3.86)</td>
</tr>
<tr>
<td>ITAXINC</td>
<td>0.0079</td>
<td>E-06</td>
<td>-0.00087**</td>
</tr>
<tr>
<td></td>
<td>(1.53)</td>
<td>(0.69)</td>
<td>(-2.70)</td>
</tr>
<tr>
<td>PTAXINC</td>
<td>0.0713*</td>
<td>-2.4 E-05**</td>
<td>-0.00277</td>
</tr>
<tr>
<td></td>
<td>(2.15)</td>
<td>(-2.57)</td>
<td>(-1.34)</td>
</tr>
<tr>
<td>TAXDEP</td>
<td>-223.9*</td>
<td>0.0167*</td>
<td>5.35**</td>
</tr>
<tr>
<td></td>
<td>(-8.11)</td>
<td>(2.16)</td>
<td>(3.10)</td>
</tr>
<tr>
<td>YOUNG</td>
<td>-348.1**</td>
<td>0.042</td>
<td>37.55**</td>
</tr>
<tr>
<td></td>
<td>(-2.37)</td>
<td>(1.02)</td>
<td>(4.08)</td>
</tr>
<tr>
<td>OLD</td>
<td>-280.9*</td>
<td>0.0904*</td>
<td>63.51**</td>
</tr>
<tr>
<td></td>
<td>(-2.02)</td>
<td>(2.30)</td>
<td>(7.29)</td>
</tr>
<tr>
<td>UNEMP</td>
<td>-81.78</td>
<td>0.0625</td>
<td>40.99**</td>
</tr>
<tr>
<td></td>
<td>(-0.36)</td>
<td>(0.96)</td>
<td>(2.85)</td>
</tr>
<tr>
<td>EMPRES</td>
<td>4745**</td>
<td>-0.1209</td>
<td>72.37</td>
</tr>
<tr>
<td></td>
<td>(4.67)</td>
<td>(-0.42)</td>
<td>(1.14)</td>
</tr>
<tr>
<td>COAST</td>
<td>13236**</td>
<td>-2.275**</td>
<td>-48.11</td>
</tr>
<tr>
<td></td>
<td>(9.45)</td>
<td>(-5.77)</td>
<td>(-0.55)</td>
</tr>
<tr>
<td>HHI</td>
<td>-18342**</td>
<td>-3.078**</td>
<td>-191.9</td>
</tr>
<tr>
<td></td>
<td>(-5.17)</td>
<td>(-3.08)</td>
<td>(-0.87)</td>
</tr>
</tbody>
</table>

R2            | 0.73      | 0.25      | 0.36      |
Adj. R2       | 0.72      | 0.22      | 0.34      |

** significant at the 1 % level
* significant at the 5 % level