European University Institute

MAX WEBER PROGRAMME FOR POSTDOCTORAL STUDIES

EUI WORKING PAPERS

MWP 2013/11
Max Weber Programme

Simpler is Better: How Do Simple Unconditional Central Grants Boost Local Own-Source Revenue in Benin?

Emilie Caldeira and Grégoire Rota-Graziosi

European University Institute
Max Weber Programme

Simpler is Better: How Do Simple Unconditional Central Grants Boost Local Own-Source Revenue in Benin?

Emilie Caldeira and Grégoire Rota-Graziosi

EUI Working Paper **MWP** 2013/11

ISSN 1830-7728

Printed in Italy
European University Institute
Badia Fiesolana
I – 50014 San Domenico di Fiesole (FI)
Italy
www.eui.eu
cadmus.eui.eu

Abstract
Intergovernmental grants design is an important issue in developing countries, where the decentralization process involves a huge vertical gap, i.e. an imbalance between the costs of local public competences and local governments' revenue raising powers. Our analysis considers the (dis)incentive effect of simple unconditional central grants on local own-source revenue. We highlight a theoretical ambiguity over the nature of this effect in assuming less efficiency of local governments in collecting taxes than of the central one. Our empirical analysis focuses on Benin. We study the impact of a very simple grant that has the properties of being collected at the borders by customs and being allocated among local governments through a fixed rule (the population of jurisdictions). Our empirical analysis covers panel data of 74 local governments from 2003 to 2008, and addresses potential endogeneity issues of central transfer. We conclude unambiguously with a positive impact of this grant on local own-source revenue. This effect is contingent on a minimum level of wealth of the jurisdiction, and is stronger for local governments that do not share the same political affiliation as the president in office. Our result emphasizes a neglected quality of unconditional transfers whose allocation rule is only based on the population of jurisdictions: their complementarity with local own-source revenue. Such transfers are not only simpler than other formula-based equalization transfers, but they may also have an incentive effect on local own-source revenue.

Keywords
Decentralization, unconditional central transfers, local own-source revenue, developing countries.

JEL Classification: H2, H77, H71, O12.

Emilie Caldeira
Max Weber Fellow, 2012-1013
European University Institute, Max Weber Programme, Via delle Fontanelle 10, I-50014 Fiesole, Italy
Email : emilie.caldeira@eui.eu

Grégoire Rota-Graziosi
Fiscal Affairs Department, International Monetary Fund, 700 19th Street, N.W., Washington, D.C., 20431, USA
Email: grotagraziosi@imf.org

1 Introduction

Since the middle of the 1980s, most African countries have started a decentralization process by transferring some power, resources, and responsibilities to their local governments. The expected gains are an increase in the responsiveness of policy to citizens' preferences, a better accountability of decision-makers, and ultimately the reduction of poverty. However, an imbalance often exists between the revenue-raising ability of local governments and their expenditure responsibilities. This vertical fiscal gap is particularly important in developing countries, since local governments' taxing powers often remain inadequate to provide sufficient financial support for the provision of basic services such as education and public health.[1] In this context, central grants are essential to the success or failure of decentralization in these countries.

However, intergovernmental fiscal transfers modify local government behaviors and their design matters as much as their total amount (Bahl, 2000; Bird and Smart, 2002). Several effects have already been highlighted in the literature. Among the most documented, the flypaper effect is an empirical regularity: any increase in transfers leads to greater local public spending than an equivalent rise in the private revenue of the local population (Hines and Thaler, 1995). In a context of informational asymmetries, central grants challenge the fiscal discipline of local governments by raising a moral hazard problem (Pisauro, 2001; Kornai, Maskin, and Roland, 2003).[2] Central grants are perceived as a kind of windfall resource, which crowd out local own-source revenue by reducing the willingness of local governments to improve their tax effort.[3] More broadly, transfer dependency seems to erode the accountability of local officials, a prerequisite of a successful decentralization process.

Given the vertical fiscal gap on the one hand and the incentive effects of central grants on the other, an important literature has been devoted to designing the structure of transfers

[1] About 60 percent of local public spending is financed through intergovernmental fiscal transfers in developing countries (Shah, 1990).

[2] Another effect of central transfers is linked to the issue of soft budget constraint, and the risk of excessive borrowing by subnational governments.

[3] See Shah (1990) for Brazilian municipalities, Panda (2009) for Indian states, and Mogues, Benin, and Cudjoe (2009) for districts of Ghana.

in developed and developing countries (Boadway and Shah, 2007; Martinez-Vazquez and Searle, 2007). Efficiency and equity concerns at the national level should determine the form of transfers. Following the literature, we consider two main categories of transfers: general (unconditional) purpose grants and selective (conditional) matching grants, the latter requiring that funds should be spent for specific purposes. In practice, grants mechanisms vary significantly among countries and combine matching and non-matching transfers.

A common view is that unconditional grants provide poor incentives for local governments to raise their own-source revenue and then to be accountable to their constituency. To mitigate this trend, some countries include a tax effort provision among economic and welfare variables in the formula which determines the allocation of transfers among their local governments. A growing literature has focused on the tax-raising effects of these systems in rich federations such as Australia, Canada, Germany, the USA and Switzerland (Smart, 2007; Egger, Koethenbuerger, and Smart, 2010). Some emerging countries, e.g. Brazil, India and Nigeria, have also introduced performance criteria such as fiscal effort in their distributive formulas for central grants (see Boex and Martinez-Vazquez, 2005, for an international comparison of formula-based allocation mechanisms). However, the lack of relevant data at the local level, especially regarding local fiscal capacity or performance, limits the use of such sophisticated transfer systems in many developing countries. Moreover, the complexity of formulas increases the risk of political capture of the grants' allocation mechanisms as has been recently emphasized in Ghana by Banful (2011) and in Senegal by Caldeira (2012).

We study the relationship between local own-source revenue and an unconditional grant, whose allocation formula is very basic, relying only on the population of jurisdictions. Assuming that local governments are less efficient at collecting taxes than the central one, we first highlight a theoretical ambiguity over the (dis)incentive effect of unconditional central grants on local own-source revenue. Neither the normality of the local public good, nor the complementarity/substitutability between public and private spending are sufficient conditions to determine the effect of grants on local own-source revenue in our very stylized analysis. The unconditional grants studied raise own-source revenue if the latter induces a sufficient

improvement in local public spending, or in other terms if the marginal utility of local public good increases in local own-source revenue.

Our empirical analysis focuses on Benin, which shares several common features with other sub-Saharan French-speaking countries such as a common history of the state, its organization, its administration, and a recent top-down decentralization process. We examine a specific unconditional grant, which is collected at the borders by customs and allocated among jurisdictions, depending only on their population size. This grant represents around 55 percent of total transfers received by local governments. Based on panel data covering 74 local governments[4] from 2003 to 2008, we conclude that there is a positive impact of this unconditional transfer on local own-source revenue. The positive effect is contingent on a minimum level of local governments wealth, allowing them to mobilize more resources. It is also stronger for jurisdictions that do not share the same political affiliation as the president in office: receiving fewer transfers from the central government, they seem to be more prone to collect resources by themselves.

Our result highlights an ignored quality of unconditional transfers based on the population of jurisdictions: their complementarity with own-source revenue. Simpler to implement than other formula-based grants, the transfer studied improves local government autonomy in Benin, not only on the expenditure side since it is not tied to any specific spending like conditional grants, but also on the revenue side through its incentive effect on local own-source revenue.[5]

The rest of the paper is organized as follows: Section 2 provides a brief theoretical discussion of the relationship between central grants and local own-source revenue; Section 3 describes the decentralization process in Benin and presents our empirical findings; Section

[4] Benin has 77 local governments. We exclude the three main urban jurisdictions (Cotonou, Porto-Novo, and Parakou), which have a special status in the Beninese intergovernmental grants system.

[5] Our conclusion also confirms the fourth lesson for transfer design given by Bird and Smart (2002):

> "... if the general purpose grant is properly designed, and if local governments have some discretion in tax policy, there is no need to include specific incentive features to encourage additional tax effort."

4 concludes.

2 A simple theoretical framework

We adopt a very stylized optimal tax theory approach. Despite its simplicity, our formalization allows us to establish a counterintuitive result, which has not been emphasized sufficiently in the literature on decentralization, especially with regard to developing countries: unconditional grants[6] may increase local own-source revenue.

We consider an economy with a composite private good (X) and a locally-provided public good (Y).[7] A representative local government maximizes the utility of its representative consumer. There are two sources of public revenue: local own-source revenue, denoted by T_L, resulting essentially from taxing the local population, and an unconditional intergovernmental grant (tr). The local government's budget constraint is then: $T_L + tr \geqslant Y$.

We assume that local authorities are less efficient at collecting tax than the central government (Hamilton, 1986;[8] Aragon, 2009). Like Hamilton (1986), we do not consider in our analysis other distortionary effects of taxation than induced administrative or compliance costs. Without loss of generality, we normalize to zero the tax collection cost incurred by the central government. We denote by $g(T_L)$ the local taxation burden which is tax payment and its induced collection costs. We have: $g(0) = 0$, $g'(T_L) > 1$, and $g''(T_L) > 0$. A partial equilibrium interpretation of our model is that central transfers are costless for recipient local governments.

The assumption of higher local collection costs for lower level governments appears particularly relevant in developing countries. First, a large part of central government revenue comes from customs in these countries (see Baunsgaard and Keen, 2010, and Keen and Man-

[6] We will use the term "unconditional grants" to qualify a non-matching transfer which does not depend on the tax behavior of local governments. The unconditionality is then twofold: it concerns not only the spending behavior of local governments but also their tax behavior.

[7] We strictly follow the notation of Hamilton (1986).

[8] With a similar assumption Hamilton (1986) explains the flypaper effect. Reviewing the academic debate over the flypaper effect, Dahlby (2011) renewed interest in Hamilton's model, which "has not received the attention that it deserves."

sour, 2010, for a closer look at sub-Saharan Africa). Tax, duties, and tariffs paid at the borders are relatively easier to collect than local taxes. Second, one of the main successful innovations in tax administration in recent years has been the creation of large taxpayer units, which exploit scale economies, concentrating countries' efforts on central taxes: Value Added Tax; Corporate Income Tax; and Personal Income Tax (Baer, 2002). Local taxes have not received the same support and attention in their design as central ones. For Bird (2011), property tax remains the missing revenue in these countries.

Taxpayers' behaviour can also explain the relative lower compliance and higher administrative costs of local taxation. Indeed, the function $g(.)$ may be considered as the reduced form of a microeconomic model, where the taxpayer and local government interact in a game à la Graetz, Reinganum, and Wilde (1986).[9] In particular, the limited capacity of local governments in tax enforcement (tax-base assessments and audits) induces some strategic behaviour among taxpayers, who systematically under-declare their income or wealth because they expect similar underreporting by their neighbours. These social interactions are stronger in smaller jurisdictions, as a result of the decentralization process. In other words, a constrained budget for tax enforcement at the local level involves strategic complementarity among taxpayers in their reporting decisions. This yields to a multiplicity of equilibria, in particular local tax riots (zero tax revenue), as analyzed by Bassetto and Phelan (2008) and Deneckere and Liang (2010).

We consider that the local government maximizes the representative resident's utility function $U(X, Y)$ subject to local government and individual budget constraints: $Y = T_L + tr$ and $y = X + g(T_L)$. The strategic variable of local government is its own-source revenue. We do not distinguish between the two tax instruments: tax rate or tax base. The optimal local tax revenue, denoted by T_L^*, is the solution of the following maximization programme:

$$T_L^* \equiv \arg\max_{T_L} U\left(y - g\left(T_L\right), tr + T_L\right).$$

[9] A formal development of this game is beyond the scope of this paper.

The First Order Condition (FOC) is given by:

$$-g'(T_L)\,U_1(.) + U_2(.) = 0. \tag{1}$$

The Second Order Condition (SOC) is assumed to be respected:

$$\frac{\partial^2 U(.)}{\partial T_L^2} = -g''(T_L)\,U_1(.) + \left(g'(T_L)\right)^2 U_{11}(.) - 2g'(T_L)\,U_{12}(.) + U_{22}(.) < 0.$$

Total differentiation of (1) with respect to tr yields:

$$\frac{\partial T_L}{\partial tr} = -\frac{-g'(T_L)\,U_{12}(.) + U_{22}(.)}{SOC} \lessgtr 0.$$

We deduce the following proposition:

Proposition 1 *Unconditional central grants improve local own-source revenue if the marginal utility of public good increases with local tax revenue* ($\partial U_2(.)/\partial T_L > 0$).[10]

The variation of the marginal utility of the public good, with respect to local own-source revenue, may be linked to individual preferences, scale economies in the provision of public goods, and the inefficiency of local administrations at tax collection. For instance, central grants increase local public spending, which may improve voluntary tax compliance, and consequently local own-source revenue ($\partial T_L/\partial tr > 0$). In contrast to this virtuous circle, a rise in transfers may also allow local governments to reduce their tax effort, keeping unchanged the level of local public goods ($\partial T_L/\partial tr < 0$). Neither the SOC nor the normality of the public good is a sufficient condition to obtain the intuitive negative relationship between central grants and local own-source revenue.[11] The sign of the cross derivative of the util-

[10] Note that

$$\partial U_2(.)/\partial T_L = -g'(T_L)\,U_{12}(.) + U_{22}(.).$$

[11] The normality of the public good is given by:

$$\frac{\partial (tr + T_L)}{\partial y} = \frac{\partial T_L}{\partial y} = -\frac{-g'(T_L)\,U_{11}(.) + U_{12}(.)}{SOC} > 0.$$

ity function ($U_{12}(.)$), which defines the complementarity or substitutability à la Edgeworth between private and public consumption, is not restricted. Assuming the concavity of the utility function with respect to public spending ($U_{22}(.) < 0$) would involve central grants increasing local own-source revenue if the degree of substitutability between public and private goods is sufficient. The literature on decentralization usually assumes independence between public and private consumption ($U_{12}(.) = 0$). Combining these two preceding assumptions ($U_{22}(.) < 0$ and $U_{12}(.) = 0$) induces the crowd out effect often emphasized in the literature: central grants reduce local own-source revenue. However, without any other restrictions than the respect of the SOC and the normality of local public goods, PROPOSITION 1 highlights a theoretical ambiguous relationship between unconditional central grants and local own-source revenue. The following section is devoted to going beyond this theoretical ambiguity through an econometric analysis of the effect of an unconditional central grant on local own-source revenue in the Beninese case.

3 Empirical analysis

In this section, we present a short history of Benin and its decentralization process, which shares some common features with other African French-speaking countries (20 countries, around 243 million inhabitants in 2009). We then develop our empirical analysis of the causal impact of central grants on local own-source revenue, considering some non-linear effects.

3.1 Benin overview

Benin belongs to the lower income group of countries, with an estimated *per capita* income of US$740 in 2011. After a succession of military governments ended in 1972, with the last coup led by Mathieu Kerekou, free elections ushered in the former Prime Minister, Nicephore Soglo, as President in 1991. With the strong support of the north of the country (Alibori, Atacora, Borgou, and Donga), Mathieu Kerekou regained power in 1996 and stepped down

in March 2006. His successor, Thomas Yayi Boni, whose power base is in the south of the country (Atlantic, Collines, and Mono) was reelected in 2011.

Decentralization in Benin is a top-down process, as in a lot of French-speaking African countries.[12] It began in 1998, through the transfer of several competencies to local Beninese jurisdictions, called *communes*. These competencies now range from elementary schools to economic development, and include transport infrastructure, environment, health, social goods, tourism, security, and marketplace management. While an elected local government manages the *communes*, a representative of the central government is in charge of départements. Local elections occurred in 2002 and 2007.

As in many African French-speaking countries, the territorial shape of Beninese *communes* results from history and not from any economic consideration with respect to efficiency in public good provision.[13] With a total population of 8.93 million inhabitants in 2009, Benin has 77 *communes* spread through 12 *départements*. Population and geographical size differ significantly among the *communes*: Tanguieta stretches out across more than 5,460 square kilometres, with a population of 62,321 inhabitants in 2008 (11.4 inhabitants per square kilometre), while Akro-Missérété contains 98,961 inhabitants in only 79 square kilometre (1,252 inhabitants per square kilometre).

Table 1 presents the 77 Beninese *communes*' revenue, distinguishing between local own-source revenue (tax and non-tax) and central grants (conditional and unconditional) over the period 2003–2008. A local representative of the central tax administration (*Directions Départementales des Impôts*) collects local taxes, mainly property and patent taxes.[14] By contrast, local governments support the collection costs of non-tax own-source revenue, related essentially to some administrative services and to public domain occupations: market

[12] A noteworthy exception is the Democratic Republic of Congo, whose new constitution, approved in 2006, is a compromise between Federalists and Centralists.

[13] For instance, Burkina Faso has 351 *communes* for 16.2 million inhabitants, while Mali has 703 *communes* for 15 million inhabitants.

[14] Note that local governments have been able to levy a specific tax called "taxe sur le developpement municipal" on any economic activity in their territory (agriculture, breeding, mining, tourism...) since 2011, the rates being determined by the central government (see Chambas, 2010, for a detailed analysis of local fiscal resources in sub-Saharan Africa).

stalls, parking charges, kiosks, hoardings etc. Over the period 2003-2008 the main conditional central grant was dedicated to the local civil servant payroll. There were also four unconditional transfers: (1) A perequation transfer; (2) A balancing grant concerning very poor *communes*;[15] (3) A grant substituting revenue raising from a suppressed *per capita* lump sum tax ("taxe civique") inherited from the colonial past; (4) A grant based on a road tax which is collected by customs on exports (0.85 percent of the value of exported goods). The latter will be decisive in our empirical analysis.

Table 1 : Average composition of the 77 Beninese *communes*' revenue - 2003-2008

(million FCFA)

	Average level	Percentage of total local revenue
Local tax own-source revenue	7,709	46
Local non-tax own-source revenue	3,949	24
Conditional central grants	350	2
Unconditional central grants	4,791	28
Road tax	*2,805*	*17*
Total local revenue	16,799	100

Source: Beninese Ministry of Finance and Economy and Beninese Tresury.

We focus on the effect of the main unconditional transfer, namely the road tax, on local own-source revenue for two reasons. First, we do not have the detailed allocation among *communes* for the other grants. Second, the annual total amount of the road tax depends on exports and is shared among *communes* following a rule which remained unchanged over the period studied: 80 percent is allocated to three "special" *communes* (Cotonou, 60 percent; Porto-Novo, 24 percent; and Parakou, 16 percent), while the rest is distributed among the

[15] Any *commune* should have a total revenue at least equal to 40 million FCFA. This grant completes other revenues if needed.

74 other *communes*, according to their respective demographic weight. Given these characteristics, the road tax displays two interesting properties for our empirical analysis: (1) its amount varies over time, allowing the use of panel methods; (2) its allocation rule is fixed, ensuring the discovery of a possible causal relationship. Indeed, fiscal capacity and/or fiscal effort are not at play in determining the allocation of this unconditional transfer so that it makes sure the relation observed between the local resources and the central grant reflects a causal impact of the grant on the local resources and not the opposite.

3.2 Econometric framework

We study the effect of road tax on local own-source revenue. We then refine our empirical work by distinguishing *communes* by their wealth and their partisan affiliation. Our dataset covers the 74 relevant *communes* over the period 2003–2008.[16] We exclude the three "special" *communes* from our sample (Cotonou, Porto-Novo, and Parakou), which have a special status in the Beninese intergovernmental grants system and differ notably from the other 74.

The first relationship we study is given by

$$T_{Lit} = \beta tr_{it} + \varphi X_{it} + \lambda T_{Lit-1} + \alpha_i + \theta_t + \varepsilon_{it}, \tag{2}$$

where T_{Lit} is the *per capita* own-source revenue of jurisdiction i at date t, tr_{it} is the unconditional central transfer received by local government i at t, and X_{it} is a set of specific controls. Among these we consider the employment rate in *département* d (N_{dt}) to control for local economic conditions**,** which can at the same time determine the total amount of transfers distributed and the level of local own-source revenue. We also control for the jurisdiction's population density (D_{it}) to capture any potential scale economies in tax collecting and in the provision of public goods. This control variable is crucial since the amount of the transfer depends on the relative population size of jurisdictions and population may also impact

[16] Data for *commune* revenues come from the Beninese Ministry of Finances and Economy. The other control variables are drawn from WDI (World Development Indicators), Afrobarometers, and Demographic and Health Surveys, provided by the National Institute of Statistic and Economic Analysis of Benin.

local own-source revenue, in particular through the existence of scale economies in tax collection or in local public goods provision. To avoid this potential bias, we consider *per capita* own-source revenue to account for the effect of the population size and we introduce the jurisdiction's population density as a control variable to capture potential scale economies. Another solution would have been to consider the *per capita* transfer, which would be identical among jurisdictions. However, in this case, we could not introduce time dummies. Hence, we keep unconditional grants in absolute terms to preserve the spatial variability of the independent variable (tr_{it}), which allows us to include time dummies. Lastly, we consider spillovers among local governments (A_{jt}), due to tax-base mobility or some yardstick competition. Grant programmes encouraging a jurisdiction to raise its own-source revenue might, thereby, induce the others to increase their revenue too. As population levels - and thus the amount of transfers received - are likely to be spatially correlated, this "copycat" effect has to be considered. A_{jt} is defined as the weighted average vector of *per capita* own-source revenue among neighbours j at time t; more formally, we consider $A_{jt} = \sum w^c T_{Ljt}$, where w^c is a contiguity matrix, taking value 1 if two jurisdictions share a common border, and zero otherwise.

We also introduce a lagged dependent variable, T_{Lit-1} to capture the persistency in local revenues (Veiga and Veiga, 2007). Variable α_i represents *commune*-fixed effects, θ_t are time dummies, and ε_{it} is the error term. Time dummies control for omitted variables that change over time but not across jurisdictions, in particular for the level of exports, which determines the total level of central transfers allocated to jurisdictions and may also affect *per capita* own-source revenue.[17] Tables 2 and 3 provide detailed summary statistics and correlations of the key variables in our analysis for the 74 *communes* over the period 2003–2008.

An important issue, emphasized by Knight (2002), Gordon (2004), and Dahlberg, Mörk, Rattso, and Agren (2008), is the risk of endogeneity of central grants. Indeed, an unconditional transfer may actually become an implicit matching transfer if central government

[17] Population density is the number of inhabitants per square kilometre. Note that we use a logarithmic form of the specification. Data is in CFA francs converted to constant value to account for inflation.

awards local governments that commit their own-source revenue to some public spending. Under such a process of negotiation, local own-source revenue determines central grants, which is the opposite relationship to what we want to analyze. In our case, we are able to check that the allocation of the remaining 20 percent of the road tax grant (80 percent is allocated to the three special *communes*) corresponds to its theoretical value, denoted by Ttr_{it}, which is:

$$Ttr_{it} = \frac{0.2\ Pop_{it}\ \Sigma tr_{it}}{\Sigma Pop_{it} - \Sigma PopSpe_t},$$

where Σtr_{it} is the sum of transfers received by jurisdictions i in year t, Pop_{it} is the population of a jurisdiction i, ΣPop_{it} is the total population in Benin at t, and $\Sigma PopSpe_t$ is the population of the three "special" *communes*. The coefficient of correlation between the road tax grant actually received and its theoretical value is equal to 0.998, significant at 1 percent level, indicating the absence of any discretion in the allocation process.

A second econometric issue results from the introduction of the lagged dependent variable (T_{Lit-1}), which reveals the inconsistency of fixed-effect estimators (Nickell, 1981). We then follow Blundell and Bond (1998), and use the GMM-System estimator, allowing us to control for unobserved country-specific effects and the potential endogeneity of explanatory variables.

Finally, we refine our empirical analysis by considering some economic and political heterogeneity among jurisdictions. We first distinguish *communes* by their wealth to capture differences in local tax bases, and/or local governments' ability to increase own-source revenue. Equation (2) becomes:

$$T_{Lit} = \beta_1(tr_{it} * P_i) + \beta_2(tr_{it} * NP_i) + \varphi X_{it} + \lambda T_{Lit-1} + \alpha_i + \theta_t + \varepsilon_{it}, \tag{3}$$

where P_i is a dummy variable taking value 1 if the local government i is poor, and zero otherwise, and $NP_i = 1 - P_i$. We consider poor those *communes* belonging to the first quartile of local own-source revenue in 2003. Secondly, we look at *communes*' partisan affiliation, which may also affect local governments' fiscal behaviour. We thus introduce a

dummy variable, denoted by F_{it}, to distinguish jurisdictions belonging to the president's electoral heartland, also called fief *communes*, from the others. More formally, the variable F_{it} takes the value 1 if the local government in *commune* i has the same partisan affiliation as the president in office, and zero otherwise, and $NF_{it} = 1 - F_{it}$. We obtain:

$$T_{Lit} = \beta_3(tr_{it} * F_{it}) + \beta_4(tr_{it} * NF_{it}) + \varphi X_{it} + \lambda T_{Lit-1} + \alpha_i + \theta_t + \varepsilon_{it}. \quad (4)$$

3.3 Results

Table 4 presents estimation results for the static version ($\lambda = 0$) of equations (2), (3), and (4) with a fixed-effect estimator. To check the robustness of our results we introduce control variables progressively.

Columns (1) and (2) in Table 4 show a positive effect of central unconditional transfers on *per capita* local own-source revenue (β varying between 0.34 and 0.41, significant at 1 percent level). Estimations of equation (3) (columns 3 and 4) emphasize a higher and more significant effect on non-poor *communes*.[18] Moreover, this effect does not exist for the poorest *communes*: the coefficient β_1 becomes insignificant if we consider very poor *communes* belonging to the first decile (columns 5 and 6).[19] Local governments without political affiliation to the president raise significantly more own-source revenue in response to higher central grants than fief *communes* (columns 7 and 8). Fisher tests allow us to conclude that coefficients β_3 and β_4 are significantly different. The coefficient of the weighted average vector of *per capita* local own-source revenue (A_{jt}) is significantly positive at 1 percent level,

[18] However, Fisher tests in these first estimations do not allow us to conclude that coefficients β_1 and β_2 are significantly different.

[19] A structural break between poor and non-poor *communes* may produce more appropriate results by separating regressions, rather than combining them into a unique one. A Chow test indicates that independent variables do not have different impacts on the different subgroups of the population. We cannot reject the null hypothesis of coefficients stability when we define poor *communes* either as *communes* belonging to the first quartile (column 1), or to the first decile (column 2).

Test of the presence of structural break between poor and non-poor

	(1)	(2)
Chow test: p-value	0.898	0.976

as expected. This result is consistent with the relevant literature, which highlights strategic complementarity among local tax policies (Brueckner, 1998; Caldeira, Foucault, and Rota-Graziosi, 2008 for the Beninese case). Population density is positively correlated with *per capita* local own-source revenue, indicating scale economies in tax collecting. In contrast, economic conditions captured by the departmental employment rate have no effect on this revenue.

Table 5 presents estimation results for the dynamic version of our empirical models ($\lambda \neq 0$) with a one-step robust GMM-System. We assume the potential endogeneity of the weighted average vector of local own-source revenue, the employment rates and the population density and strict exogeneity of our independent variable and time dummies. The lagged levels of the variables are used as instruments in regressions in level, as well as in regressions in difference. Following Roodman (2009), we collapse the instruments and limit their number to avoid a non-optimal weight matrix, biased standard errors, and incorrect over-identification tests.[20] Column (1) in Table 5 attests to a positive effect of unconditional grants on local own-source revenue, β remaining significantly positive. The estimation results in Table 5 also highlight the heterogeneous impact of decentralization: this effect is smaller for poor *communes* (columns 2 and 3), and is stronger for local governments not belonging to the president's electoral heartland (column 4). Fisher tests tend to confirm significant differences among these coefficients.

Tackling the endogeneity issue of central grants, our analysis concludes that there is a positive effect of unconditional transfers on local own-source revenue. This result differs from Shah (1990), Rajaraman and Vasishtha (2000), and Panda (2009), who obtain an opposite relationship by studying Brazilian municipalities and Indian states, respectively. However, these authors do not consider any potential endogeneity bias. Addressing the issue of the endogeneity of grants, Mogues, Benin, and Cudjoe (2009) also show that transfers (from the central government and donor funds) discourage local own-source revenue in Ghana. A

[20] With the Hansen test we cannot reject the null hypothesis of the overall validity of the instruments' orthogonality conditions.

possible explanation for the difference between Mogues, Benin, and Cudjoe (2009) and our results is the lower fiscal autonomy of Ghana's districts with respect to Beninese *communes*. The main resources of the former are conditional grants, which restrict Ghanaian local governments in their expenditure choices. Being less accountable in spending, districts have less incentive to raise revenue. Another complementary explanation is provided by Banful (2011) who established that central grants remain politically motivated despite a formula-based resource allocation mechanism. This is not the case in Benin, where the allocation of the main unconditional transfer (the road tax) respects the population of the jurisdictions rule.

Turning to works on developed countries, our conclusion is close to Skidmore (1999), Smart (2007), Buettner (2006), and Dahlberg, Mörk, Rattso, and Agren (2008). The first two authors identify a positive effect of central grants on locally generated revenues in the USA and Canada, respectively. Buettner (2006) and Dahlberg, Mörk, Rattso, and Agren (2008) come to a similar conclusion for Germany and Sweden. Both studies use a discontinuity in the grant allocation rule to deal with the endogeneity issue of grants. However, these works only focus on equalization or total transfers. Our analysis complements these by highlighting the incentive effect of unconditional grants on local own-source revenue in a developing country.

4 Conclusion

By adopting a simple model of optimal taxation, we have highlighted a theoretical ambiguity over the effect of unconditional central grants on local own-source revenue. Our empirical analysis focuses on Benin. We study the effect of unconditional grants that have the properties of being collected centrally and allocated among local governments through a fixed and simple rule (population of jurisdictions). Our results highlight a positive impact of this transfer on local own-source revenue. This effect is contingent on a minimum level of local government wealth. Moreover, jurisdictions that do not share the same political affiliation as the president in office are more prone to mobilize revenue than other *communes*.

Unconditional central grants alleviate the revenue constraints of local governments both

directly and indirectly. The transfer that we study here, namely the road tax, is far from being perfect. Collected at the border, it is equivalent to a tax on exports, which may be detrimental for the Beninese economy. Moreover, despite its incentive effect on own-source revenue, it does not address the equity issue. A natural extension of our analysis would be to consider local public spending, in order to assess the overall and redistributional impact of this transfer.

However, our result contributes to the debate on designing an appropriate intergovernmental transfer system in developing countries. Allocating central grants on a performance basis is often presented as the only way to provide adequate incentives to local governments in terms of fiscal discipline. An implicit assumption of such a statement is that simple unconditional transfers reduce recipient governments' tax collection efforts. We emphasize that this hypothesis is not only untrue in Benin, but also that this kind of grants actually has an incentive effect on local own-source revenue. Further studies are clearly necessary to establish if Benin is only a counter-example, or if our result holds more generally for developing countries. However, we must highlight that simple unconditional grants should be more closely considered to solve the vertical imbalance in developing countries. In addition to their potential incentive effect on local own-source revenue, they are, in practice, easier to ascertain and less vulnerable to discretion and manipulation in their allocation than other more complex formula-based transfers.

References

Aragon, F. (2009): "The flypaper effect revisited," Economic organisation and public policy discussion papers series, Suntory and Toyota International Centres for Economics and Related Disciplines, LSE.

Baer, K. (2002): "Improving large taxpayer compliance: A review of country experience," Occasional Paper 215, International Monetary Fund.

Bahl, R. (2000): "Intergovernmental transfers in developing and transition countries: Principles and practice," Discussion Paper 2, The World Bank, Background Series.

Banful, A. B. (2011): "Do formula-based intergovernmental transfer mechanisms eliminate politically motivated targeting? Evidence from Ghana," *Journal of Development Economics*, 96(2), 380–390.

Bassetto, M., and C. Phelan (2008): "Tax riots," *Review of Economic Studies*, 75(3), 649–669.

Baunsgaard, T., and M. Keen (2010): "Tax revenue and (or?) trade liberalization," *Journal of Public Economics*, 94(9-10), 563–577.

Bird, R. M. (2011): "Subnational taxation in developing countries: A review of the literature," *Journal of International Commerce, Economics and Policy*, 2(01), 139–161.

Bird, R. M., and M. Smart (2002): "Intergovernmental fiscal transfers: International lessons for developing countries," *World Development*, 30(6), 899–912.

Blundell, R., and S. Bond (1998): "Initial conditions and moment restrictions in dynamic panel data models," *Journal of Econometrics*, 87(1), 115–143.

Boadway, R., and A. Shah (2007): *Intergovernmental fiscal transfers: principles and practices*, Public Sector Governance and Accountability Series. Washington, D.C.: The World Bank.

Boex, J., and J. Martinez-Vazquez (2005): "The determinants of the incidence of intergovernmental grants: A survey of the international experience," Working Paper Series, at AYSPS, GSU 0509, International Studies Program, Andrew Young School of Policy Studies, Georgia State University.

Brueckner, J. K. (1998): "Testing for strategic interaction among local governments: The case of growth controls," *Journal of Urban Economics*, 44(3), 438–467.

Buettner, T. (2006): "The incentive effect of fiscal equalization transfers on tax policy," *Journal of Public Economics*, 90(3), 477–497.

Caldeira, E. (2012): "Does the System of Allocation of Intergovernmental Transfers in Senegal Eliminate Politically Motivated Targeting?," *Journal of African Economies*, 21(2), 167–191.

Caldeira, E., M. Foucault, and G. Rota-Graziosi (2012): "Decentralisation in Africa and the Nature of Local Governments' Competition: Evidence from Benin," NBER Working Papers 18126, National Bureau of Economic Research, Inc.

Chambas, G. (2010): *Mobiliser des ressources locales en Afrique subsaharienne*. Economica, Paris.

Dahlberg, M., E. Mörk, J. Rattso, and H. Agren (2008): "Using a discontinuous grant rule to identify the effect of grants on local taxes and spending," *Journal of Public Economics*, 92(12), 2320–2335.

Dahlby, B. (2011): "The marginal cost of public funds and the flypaper effect," *International Tax and Public Finance*, 18(3), 304–321.

Deneckere, R., and M.-Y. Liang (2010): "The congestion effect in tax compliance and enforcement," Discussion paper, Department of Economics, University of Wisconsin.

Egger, P., M. Koethenbuerger, and M. Smart (2010): "Do fiscal transfers alleviate business tax competition? Evidence from Germany," *Journal of Public Economics*, 94(3-4), 235–246.

Gordon, N. (2004): "Do federal grants boost school spending? Evidence from Title I," *Journal of Public Economics*, 88(9-10), 1771–1792.

Graetz, M. J., J. F. Reinganum, and L. L. Wilde (1986): "The tax compliance game: Toward an interactive theory of law enforcement," *Journal of Law, Economics and Organization*, 2(1), 1–32.

Hamilton, J. H. (1986): "The flypaper effect and the deadweight loss from taxation," *Journal of Urban Economics*, 19(2), 148–155.

Hines, J. R., and R. H. Thaler (1995): "Anomalies: The flypaper effect," *The Journal of Economic Perspectives*, 9(4), 217–226.

Keen, M., and M. Mansour (2010): "Revenue mobilisation in sub-saharan Africa: Challenges from globalisation I - trade reform," *Development Policy Review*, 28(5), 553–571.

Knight, B. (2002): "Endogenous federal grants and crowd-out of state government spending: Theory and evidence from the federal highway aid program," *The American Economic Review*, 92(1), 71–92.

Kornai, J., E. Maskin, and G. Roland (2003): "Understanding the soft budget constraint," *Journal of Economic Literature*, 41(4), 1095–1136.

Martinez-Vazquez, J., and B. Searle (eds.) (2007): *Fiscal equalization: Challenges in the design of intergovernmental transfers*. Springer.

Mogues, T., S. Benin, and G. Cudjoe (2009): "Do external grants to district governments discourage own-revenue generation?: A look at local public finance dynamics in Ghana," IFPRI discussion papers 934, International Food Policy Research Institute (IFPRI).

Nickell, S. J. (1981): "Biases in dynamic models with fixed effects," *Econometrica*, 49(6), 1417–26.

Panda, P. K. (2009): "Central fiscal transfers and states' own-revenue efforts in India: Panel data models," *The Journal of Applied Economic Research*, 3, 223.

Pisauro, G. (2001): "Intergovernmental relations and fiscal discipline: Between commons and soft budget constraints," Working Paper 01/65, International Monetary Fund.

Rajaraman, I., and G. Vasishtha (2000): "Impact of grants on tax effort of local government," *Economic and Political Weekly*, 35(33), 2943–2948.

Roodman, D. (2009): "A note on the theme of too many instruments," *Oxford Bulletin of Economics and Statistics*, 71(1), 135–158.

Shah, A. (1990): "The new fiscal federalism in Brazil," Policy Research Working Paper Series 557, The World Bank.

Skidmore, M. (1999): "Tax and expenditure limitations and the fiscal relationships between state and local governments," *Public Choice*, 99(1-2), 77–102.

Smart, M. (2007): "Raising taxes through equalization," *Canadian Journal of Economics*, 40(4), 1188–1212.

Veiga, L., and F. Veiga (2007): "Political business cycles at the municipal level," *Public Choice*, 131(1), 45–64.

Table 2: Descriptive statistics of the key variables (74 *communes*, 2003–2008)

	Mean	Std dev.	Min	Max
per capita own-source revenue (T_{Lit})	712.60	826.84	6.72	6931.68
Road tax (tr_{it})	10,200,000	5,245,727	124,200	50,900,000
Employment rate (N_{dt})	26.52	10.61	3.45	56.54
Population density (D_{it})	161.10	197.75	7.61	965.95
Partisan affiliation, F_{it}	0.60	0.48	0	1
First quartile of poor, P_i	0.25	0.43	0	1
First decile of poor, P_i'	0.10	0.31	0	1

Table 3: Correlation of the key variables (74 *communes*, 2003–2008)

	T_{Lit}	tr_{it}	N_{dt}	D_{it}	F_{it}	P_i	P_i'
per capita own-source revenue (T_{Lit})	1						
Road tax (tr_{it})	0.995*	1					
Employment rate (N_{dt})	-0.050	-0.103*	1				
Population density (D_{it})	0.405*	0.116*	-0.028	1			
Partisan affiliation (F_{it})	0.249*	0.019	0.172*	0.477*	1		
First quartile of poor (P_i)	-0.338*	-0.083	-0.004	-0.177*	-0.204*	1	
First decile of poor (P_i')	-0.204*	-0.089	0.149*	-0.146*	-0.032	0.592*	1

*: coefficient significant at 10 % level

Table 4: Estimation results- Static models

Dep. variable.: Local p.c own-source revenue	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Road tax (tr_{it})	0.348***	0.418***						
	(0.08)	(0.07)						
$tr_{it} * P_i$ or $tr_{it} * F_{it}$			0.312**	0.299**	0.185	0.224	0.265***	0.331***
			(0.14)	(0.13)	(0.18)	(0.18)	(0.08)	(0.07)
$tr_{it} * NP_i$ or $tr_{it} * NF_{it}$			0.357***	0.456***	0.374***	0.458***	0.619***	0.622***
			(0.09)	(0.07)	(0.09)	(0.07)	(0.11)	(0.12)
Own-revenue in j (A_{jt})		0.575***		0.602***		0.539***		0.576***
		(0.16)		(0.17)		(0.16)		(0.16)
Population density (D_{it})		1.125*		1.101*		1.098**		1.371**
		(0.98)		(0.84)		(0.35)		(0.43)
Employment rate (N_{dt})		0.825		0.798		0.499		1.125
		(2.69)		(2.63)		(2.61)		(3.55)
Fixed-Effect	yes	yes	yes	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes
Fisher test: p-value	-	-	0.775	0.286	-	-	0.009	0.041
No. of units	74	60	74	60	74	60	74	60
Observations	318	263	318	263	318	263	318	263

Robust standard errors are in brackets.***: coefficient significant at 1 % level, **: at 5 % level, *: at 10 % level.

Table 5: Estimation results - Dynamic models

Dep. variable.: Local p.c own-source revenue	(1)	(2)	(3)	(4)
Road tax (tr_{it})	0.485***			
	(0.07)			
($tr_{it} * P_i$) or ($tr_{it} * F_{it}$)		0.411***	0.418***	0.447***
		(0.07)	(0.08)	(0.07)
($tr_{it} * NP_i$) or ($tr_{it} * NF_{it}$)		0.525***	0.504***	0.598***
		(0.07)	(0.07)	(0.10)
Lagged dep. var. (T_{Lit-1})	0.304**	0.323**	0.296**	0.270*
	(0.15)	(0.13)	(0.13)	(0.16)
Local tax revenue in j (A_{jt})	0.071	0.061	0.043	0.180
	(0.40)	(0.35)	(0..40)	(0.45)
Population density (D_{it})	0.367***	0.309***	0.324***	0.477***
	(0.13)	(0.11)	(0.12)	(0.15)
Employment rate (N_{dt})	-0.218	0.175	0.852	2.510
	(1.79)	(1.59)	(1.85)	(2.82)
Year dummies	yes	yes	yes	yes
AR (1): p-value	0.000	0.000	0.000	0.001
AR (2): p-value	0.299	0.297	0.295	0.241
Hansen test : p-value	0.298	0.233	0.278	0.363
Fisher test: p-value	-	0.022	0.123	0.111
No. of instruments	21	22	22	22
No. of units	60	60	60	60
Observations	204	204	204	204

Robust standard errors are in brackets.***: coefficient significant at 1 % level, **: at 5 % level, *: at 10 % level.