Decentralization in Africa and the nature of local governments' competition: evidence from Benin

First draft

Abstract

The aim of this paper is to analyse some aspects of decentralization in a developing country. By estimating a dynamic panel data model, we test the existence of interjurisdictional competition between local governments in Benin, called "communes". We identify its nature: local governments policies are strategic complements. We show that these strategic interactions exist not only among geographical neighbouring "communes", but also between ethnically close ones. Moreover, local governments seem to adopt an opportunistic behaviour before elections and to be subject to electoral pressure from local citizens.

JEL Classification: D72, H2, H7
Keywords: Spending interactions, Benin, decentralization, local government, dynamic panel data.

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1 Introduction

Governance decentralization has recently been embraced by a large number of developing countries since it has been considered as a powerful tool to reduce poverty and improve governance. In particular, the World Bank considered it as one of the major reforms on its agenda. In response to the failure of central state to run the countries' development or to limit the risk of civil conflicts in fragmented countries, decentralization has been advocated as an instrument to ensure political stability, increase the efficiency of public policy and to improve accountability and responsiveness of local leaders.

Providing some public goods in a decentralized fashion can increase efficiency in resource allocation for several reasons. First, the theory of fiscal federalism holds that decentralization can improve allocative efficiency since heterogeneous preferences and needs are likely to be better revealed and addressed by local officials that are closer and more accountable to constituents. Indeed, local governments are better positioned to recognize local preferences and needs (Faguet (2004)) and, when preferences differ across localities, decentralized provision of public goods allows a mix of services that improve "preference-matching" (Oates (1972)). Secondly, decentralization can reduce decision-making time and information costs associated with diseconomies of scale. For instance, Alderman (2002) shows that local officials are able to manage anti-poverty programs more accurately and cost-effectively than a central government agency since they are likely to be better informed. Bardhan and Mookherjee (2005), Galasso and Ravallion (2005) have also shown that decentralization of delivery system promotes cost-effectivness and improves intraregional targeting. In this way, decentralization may lead to poverty reduction from the bottom up.[1] Lastly, decentralization can achieve a more efficient allocation of resources by forcing local governments to compete for constituents. Local citizens can choose their preferred mix of public services by "voting with their feet" (see Tiebout (1961)) but also by voting out of office politicians whose policies are not in accord with their preferences, inducing a "yardstick competition" (see Besley and Case (1995)).[2]

[1] The relationship between decentralization and poverty alleviation has been reviewed by Klugman (1997) or Bird and Rodriguez (1999).

[2] Besley and Case (1995) provide a sophisticated theoretical framework and empirical evidence of this phenomenon using US state panel data from 1960 to 1988.

However, decentralization is not the panacea for every trouble in developing countries. First, following the Oates'theorem, a centralized provision of public goods is preferable when interjurisdictional spillovers are important with respect to the population heterogeneity. Secondly, decentralization may worsen vertical equity since it reduces redistributive powers of central governments from richer to poorer jurisdictions. Third, some authors have also noted that local decision-makers may lack technical capacities to make appropriate decisions, reducing the effectiveness of public services provision. Lastly, for Prud'homme (1995) or Bardhan and Mookherjee (2005), decentralization may increase corruption by allowing "local capture" of decision-making processes by local elites.

Bahl and Linn (1994) or Bardhan (2002) hold that the conventional arguments that decentralized provision of public goods will increase efficiency in resource allocation may not be applicable in developing countries. The reason is that most developing countries do not meet implicit or explicit assumptions posed by fiscal federalism theory. Actually, the main necessary assumption for the efficiency of decentralization in every (poor or rich) country is the existence of some interjurisdictional competition. Without this, decentralization may be then a cure worse than the disease.[3] The aim of this paper is first to establish the existence (or not) of a competition among beninese local governments, and secondly to identify the nature of this competition if it exists. By nature of the competition, we refer to the Industrial Organization literature, in particular the well established definition by Bulow, Geanakoplos, and Klemperer (1985) of strategic complements or strategic substitutes. Indeed, strategic complements or substitutes modify the behaviors of competitors and impact the (in)efficiency of decentralization.

The evaluation of decentralization in developing countries has rarely been empirically tested (see Akin, Hutchinson, and Strumpf (2005)), in particular in countries of the Sub-Saharan region because of the lack of available relevant data. We intend to tackle three series of issues: (1) Does decentralization induce interjurisdictional competition? What is the nature of the competition (strategic complements or substitutes)? (2) Which factors (geographical, political or ethnical) contribute to boost fiscal competition? (3) What is the fiscal setting behaviour of

[3] Jütting, Kauffmann, McDonnell, Osterrieder, Pinaud, and Wegner (2004) find that an unambiguous link between decentralization and poverty reduction cannot be established. In some of the poorest countries characterized by weak institutions and political conflicts, decentralization could actually make matters worse.

local governments in election period?

The remainder of the paper is divided into four sections. Section 2 presents a rigorous theoretical analysis of strategic spending interactions. In Section 3, we test whether there exists such interactions among Beninese local governments between 2003 and 2008; we also try to identify the fiscal setting behaviour of local governments in election period. Section 4 evaluates electoral pressure from local citizens by identifying the presence of some types of interaction (especially, "yardstick competition") which can generate the observed spatial pattern. Section 5 concludes.

2 A theoretical background

We develop a theoretical model in order to highlight behaviours at play in determining the levels of public spending. Most of the theoretical literature on jurisdictions' interactions consider tax competition. Few papers focus on other policies than tax rates, for instance Keen and Marchand (1997) or Bucovetsky (2005). We consider 2 jurisdictions (i and j) of the same level. We do not study political issue and then adopt a welfare approach. The utility function of a representative individual in jurisdiction i is given by $W^i(x_i, g_i, g_j; \theta_i)$, where x_i is the private consumption, g_i the public spending in jurisdiction i, and θ_i is an exogeneous parameter which represents the degree of spillover effect for inhabitant in jurisdiction i from the public good provided in jurisdiction j. We may have situations where spillovers are not symmetric ($\theta_i \neq \theta_j$). We define $\theta = (\theta_i, \theta_j)$.

Aschauer and Greenwood (1985), Barro (1990) and others emphasize the distinction between public goods and services that enter into the household's utility function and those that complement private sector production. The first kind of public spending may be considered as substitutes to private consumption while the second one increases private income and is more presented as a complement to private consumption. Since in developing countries most of the public investments as the local level are managed from the central governement through for instance specific subventions, we prefer to focus on the first kind of public spendings.

We then consider the following quasi-linear utility function

$$W^i\left(x_i, g_i, g_j; \theta\right) = x_i + v^i\left(g_i, g_j; \theta_i\right)$$

The function $v\left(.\right)$ is the appreciation of local public goods in jurisdiction i. We assume that

$$\begin{aligned} v_1^i\left(g_i, g_j; \theta_i\right) &\equiv \frac{\partial v\left(g_i, g_j; \theta_i\right)}{\partial g_i} > 0, \quad v_{11}^i\left(g_i, g_j; \theta_i\right) \equiv \frac{\partial^2 v\left(g_i, g_j; \theta_i\right)}{\partial g_i^2} < 0 \\ v_2^i\left(g_i, g_j; \theta_i\right) &\equiv \frac{\partial^2 v\left(g_i, g_j; \theta_i\right)}{\partial g_j^2} > 0, \quad v_{\theta_i}^i\left(g_i, g_j; \theta_i\right) \equiv \frac{\partial v\left(g_i, g_j; \theta_i\right)}{\partial \theta_i} > 0 \end{aligned}$$

We do not specify the sign of $\frac{\partial^2 v(g_i, g_j; \theta_i)}{\partial g_i \partial g_j}$, whom consequences will be discussed below.

We ignore the issue of local debt, which is the focus on an important literature on the soft budget constraint. Very few countries in Africa allow their local governments to run into debt. Thus, private consumption is equal to the net income, and the local government faces the following hard Budget Constraint (BC):

$$R_i = x_i + c\left(g_i\right) \tag{1}$$

where R_i is the income of jurisdiction i and $c\left(.\right)$ is the cost of providing a level g_i of local public good. This cost is assumed increasing and convex: $\frac{dc(g_i)}{dg_i} > 0$ and $\frac{d^2 c(g_i)}{dg_i^2} > 0$. Substituting the expression of the private consuption given by (1) in the initial welfare function, we obtain the following objective function, denoted by V^i, which depends only on the strategic variables (g_i, g_{-i}):

$$V^i\left(g_i, g_j; \theta_i\right) \equiv W^i\left(R_i - c\left(g_i\right), g_j; \theta_i\right)$$

Each local government choose their level of public spending, considering as given the levels of public good in the other jurisdiction. The played game is static and the Nash equilibrium may be constrained . Thus, the solution is denoted by g_i^*,

$$g_i^* = \min\left\{\overline{g}_i, \widetilde{g}_i\left(\theta\right)\right\}$$

where $\overline{g}_i$ is given by

$$R_i - c\left(\overline{g}_i\right) = 0$$

and $\widetilde{g}_i\left(\theta\right)$ by the following maximization program:

$$\forall i, \quad \widetilde{g}_i\left(\theta\right) \equiv \underset{g_i \geqslant 0}{\arg\max} V^i\left(g_i, g_j^*; \theta_i\right)$$

The set of strategies for each jurisdiction is compact and corresponds to $[0, \overline{g}_i]$. The First Order Condition of the preceding program is

$$-\frac{dc\left(g_i\right)}{dg_i} + v_1^i\left(\widetilde{g}_i\left(\theta\right), g_j^*\left(\theta\right); \theta_i\right) = 0 \tag{2}$$

The Second Order Condition is respected trhough the convexity of the cost function and the concavity of the function $v\left(.\right)$ with respect to its firts argument.

We focus on the nature of competition among jurisdictions when it exists and its consequences. This competition is apprehended through the study of strategic interactions, more formally through the sign of $\frac{dg_i}{dg_j}$, where $i \neq j$. Following Bulow, Geanakoplos, and Klemperer (1985), we define the local public goods as strategic complements if and only if the marginal utility of public good in jurisdiction i is increasing in the level of local public goods in the other jurisdictions, more formally if $\frac{\partial^2 V^i(g_i, g_j; \theta_i)}{\partial g_i \partial g_j} > 0$. Strategic substitutes are defined with the opposite relationship. If jurisdiction is constrained by its wealth, we have $g_i^* = \overline{g}_i$ and thus $\frac{\partial g_i}{\partial g_j} = 0$; otherwise ($g_i^* = \widetilde{g}_i\left(\theta_i\right)$) we apply the envelop theorem to (2) which yields:

$$\frac{\partial g_i}{\partial g_j} = -\frac{\frac{\partial^2 V^i(g_i, g_j; \theta_i)}{\partial g_i \partial g_j}}{\frac{\partial^2 V^i(g_i, g_j; \theta_i)}{\partial g_i^2}} \tag{3}$$

Since the denominator corresponds to the Second Order Condition of the maximization program, the sign of $\frac{\partial g_i}{\partial g_j}$ is then equivalent to the sign of $\frac{\partial^2 V^i(g_i, g_j; \theta_i)}{\partial g_i \partial g_j}$, which also corresponds to the sign of $\frac{\partial^2 v^i(g_i, g_j; \theta_i)}{\partial g_i \partial g_j}$.

We consider two kinds of parameters' perturbation. The first one is a unilateral change in the degree of the spillovers experimented in jurisdiction i from jurisidction j. By doing that,

we appreciate the effect for instance a change in the proximity among communes. The second one consists to assume that the degrees of spillovers among jurisdictions are identical, formally $\theta_i = \theta_j = \theta$, and then we appreciate the effect of a change in θ on the level of local public goods. Such a change might capture some effects of electoral years, where a yardstick competition, for instance, reinforces the exposition of jurisdictions. However, to doing these comparative statics, we follow the work of Caputo (1996). Indeed, unlike single-agent models, knowledge of how a parameter affects the marginal value of the i th player's decision variables in a static game is not sufficient to determine the Nash equilibrium comparative statics for the level of the i th player's decision variables. The i th player must also determine how a change in the other player' decision variable affects the marginal value of the i th player's decision variable, as well as how the parameter perturbation affects the Nash equilibrium value of the decision variables of the other player.

We focus on the effect on the provided level of public good in jurisdiction i induced by a change in the degree of spillover between jurisdictions i and j, denoted by θ_i. We obtain the following proposition:

Proposition 1 *Under our assumptions, we have*

(i) If one jurisdiction is constrained by its wealth, there is no strategic interaction;

(ii) An increase in the degree of spillover from jurisdiction j to i (θ_i) involves a variation in the same (opposite) sense in both jurisdictions if local public goods are strategic complements (substitutes).

Proof. See Appendix A.1.2. ■

To comment...

Concerning a uniform change in the degree of spillovers (assumed identical among jurisdiction), we have

Proposition 2 *An increase in the degree of spillover among jurisdictions* (θ) *involves a variation of the level of local public goods in the same sense in both jurisdictions whatever is the nature of competition among them (strategic complements or substitutes).*

Proof. See Appendix A.1.2. ■

To comment...

3 Empirical evidence of public spending interactions in a less developing country

While most of the literature estimates reaction function for taxes, little attention has been paid on the public expenditures side. Redoano (2007) and Foucault, Madies, and Paty (2008) have previously found that some interactions take place among neighbouring jurisdictions with respect to expenditures for respectively EU countries and French municipalities. In particular, Foucault, Madies, and Paty (2008) find that public expenditures in one french municipality positively depend on public spending set in neighbouring jurisdictions, leading to the conclusion that public expenditures are "strategic complements". However, to our knowledge, few empirical studies test the existence of such interactions in developing countries while there appears to be an increasing trend of fiscal decentralization in those countries. In their study of Public Health Sector in Uganda Akin, Hutchinson, and Strumpf (2005) examine whether decentralisation actually leads to greater health sector efficiency and provide evidence for the hypothesis that spillover effects cause spending on public goods in one district to reduce spending on public goods in neighbouring districts. Local public spending are, in this case, "strategic substitutes". Our first empirical work consists in testing the existence of spending strategic interactions and whether strategic variables are complements or substitutes.

3.1 Political Context

We have selected a Sub-Saharan country, Benin, for different reasons. First of all, Benin is a young democracy, which is quite representative of the region. With a per capita income of US$570 in 2007 and a ranking of 163 out of 177 countries[4], Benin remains one of the poorest countries of the world. It is ethnically fragmented: there are around 42 ethnic groups in the country. The most prominent are the Yoruba in the north, the Fon in the south-central area, the Adjara along the coast, and the Bariba in the northeast. Last but not least, the quality of local public finance statistics enables to perform a rigorous empirical analysis.

Since its independence on 1st August 1960, the history of Benin is chaotic. A succession of military governments ended in 1972 with the last military coup led by Mathieu Kerekou and the establishment of a government based on Marxist-Leninist principles. A move to representative government began in 1989. Two years later, free elections ushered in former Prime Minister Nicephore Soglo (a former World Bank official) as president, poiting out the first successful transfer of power in Africa from a dictatorship to a democracy. Kerekou regained power in 1996 in elections fraught with irregularities and won subsequent elections in 2001. Having served two terms and being over 70, he was ineligible to run in the presidential elections of 2006. He was succeeded by Thomas Boni Yayi an economist who had previously headed the West African Development Bank, who is a political outsider and independent. In March 2007, President Yayi Boni strengthened his position following the legislative elections in which his coalition, "Force Cauris pour un Bénin Emergent (FCBE)" won the largest number of seats (35 out of 83) and negotiated a pro-government majority in the Parliament with seven minor parties and coalitions joining the FCBE.

This new democratic process was accompanied by a huge transformation of the political and administrative organization. Indeed, Benin experienced since 1998 a decentralization process that became effective with local elections in 2002. The second local elections took place in 2008. As depicted in Figure 1, Benin is divided into 12 "*départements*" which are subdivided into 77 "*communes*" and at their turn divided into 546 districts. *Départements* are managed by

[4] Human Development Report (2007).

a representative of the central government (their study links to the issue of deconcentration). By contrast, *communes* are managed by a local government directly elected by the relevant inhabitants. The average size of "communes" reaches about 90,000 inhabitants.

Political struggle is organized at both levels: national and local. At the municipal level, political competition is driven by complex issues as infrastructures providers, health organization. Another source of electoral competition came from ethnic fragmentation. Indeed local officials can be separated according to the ethnicity to which they belong. For the first municipal election in 2003, Langley, Mondjanagni, Fadé, Gbédo, Zourkaïnény, and Moussiliou (2005) have observed that unexpected (and sometimes instable) alliances have emerged from national political parties and local leaders. Among the new 1199 local officials, about one fourth were independent and did not belong to national parties. To illustrate this puzzling configuration, only one party (Union pour le Bénin Futur) through a large party coalition was able to present a candidate in each constituency.

In January 1999, the Beninese government has enforced the 97-029 Law which defines for the first time in its history what are the competencies transfered from the centre to the 77 "communes". Competencies of Beninese cities range from elementary school to economic development and include transport infrastructure, environment (hygiene), health and social goods, tourism, security or marketplace management. Beninese local resources are characterized by its low level: they represent only about 4.5% of country tax-revenues and about 0.7% of GDP. Moreover, there are important inequalities between communes: the ten poorest communes' local resources are equivalent to 5% of the five richest communes' ones. Local resources come mainly from communes' own resources (about 70%). Property taxes license to exercise a trade or profession ("patente") and manufacturing or distribution license represent 90% of local tax-revenue. There are also taxes on quarries' exploitation, on advertisement, on taxi drivers and a tax on local development. Tax-revenue represents the main part of communes' own resources (about 70%). Retroceded taxes which come from transfers of state tax-revenue to local governments, constitute about 10% of locals resources.[5] State grants-in-aid are added to communes' own resources but they only represent about 20% of global local resources. However, communes'

[5] 3% of road, rail and waterways network's tax and of the tax of value added tax.

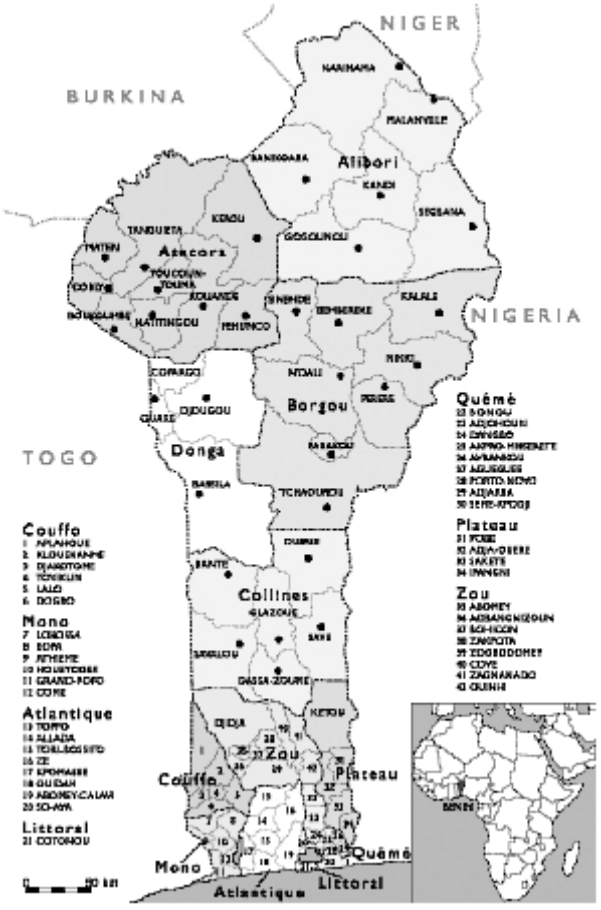

Figure 1: Administrative map of Benin

reliance on these state subsidies is unequal. For example, grants-in-aid represent less than 3% of Atlantic resources but about 30% of Oueme' ones. Moreover, they don't seem to play the classical function of balancing out.

Local resources of Beninese communes (million FCFA)					
Years	2003	2004	2005	2006	2007
Fiscal resources	7 658	8 806	8 333	9 712	10 878
% of global resources	0,5	0,47	0,47	0,48	0,48
Non fiscal resources	2 149	3 375	4 265	4 091	4 808
% of global resources	0,14	0,18	0,24	0,2	0,21
Communes'own resources	9 807	12 181	12 598	13 803	15 686
% of global resources	0,64	0,65	0,71	0,69	0,69
Retroceded tax-revenue	674	1 832	2 032	3 780	4 132
% of global resources	0,05	0,1	0,11	0,19	0,18
State subsidies	4 760	4 708	3 174	2 470	2 928
% of global resources	0,31	0,25	0,18	0,12	0,13
Global local resources	15 244	18 723	17 806	20 055	22 748

As we noted before, decentralization, defined as the transfer of power, responsibility and resources from central government to local and independent administrations, has been implemented to improve the production of public goods by stimilating intergovernmental competition [6]. Since local resources come mainly from communes' own resources, local decision-makers have some breathing space in their fiscal choices. The aim of our empirical work is, first, to test whether there actually exists intergovernmental competition between Beninese local governments.

[6] The first round of the municipal elections held on 15th December 2002 and the second round on 19th January 2003 with an average rate of turnout estimated at 70 per cent.

3.2 Empirical Strategy

Our dataset covers the two elections and 77 "communes". Data for communes' current expenditures come from *Beninese Ministry of Finances and Economy.* The other control variables are drawn from *WDI* (World Development Indicators), *Afrobarometers*, *Demographic and Health Surveys* provided by the *National Institute of Statistic and Economic Analysis of Benin* and 77 monographs realized for the *Mission of Decentralization.*

Horizontal interactions entail a fiscal reaction function that depicts how the decision variable for a given jurisdiction depends on the decisions of other jurisdictions. To test the existence of such functions, we follow the literature and we consider a specification in the most general form in which "commune" i public expenditures in year t, S_{it}, are a function of its neighbours same public choice, S_{jt}. Moreover, we allow S_{it} to depend on a vector of specific controls X_{it} and we include a "commune" specific effect α_i[7].

This gives the following specification:

$$S_{it} = \sum \theta_{ij}.S_{jt} + \beta.X_{it} + \alpha_i + \varepsilon_{it}, \tag{4}$$

where $i = 1, \ldots, n$ denotes a "commune" and $t = 1, \ldots, T$ a time period, α, β and θ are unknown parameters and ε_{it} a random error.

Since there are too many parameters θ_{ij} to be estimated, the usual procedure is to estimate:

$$S_{it} = \theta'_{ij}.A_{jt} + \beta.X_{it} + \alpha_i + \varepsilon_{it}, \tag{5}$$

where $A_{jt} = \sum W_{ij}.S_{jt}$. S_{it}, the vector of public spending in a local government i at time t depends on A_{jt}, the weighted average vector of public spending in the set of the others local governments j at time t and a set of specific controls X_{it} [8].

We explore a variety of weighting schemes to allow different patterns of spatial interactions. In this way, we will better understand the nature of the neighbouring effects and will discuss

[7] All time-invariant community characteristics, observed or unobserved can be represented by community-specific intercepts.

[8] Weights are normalized so that their sum equals unity for each i.

the definition of distance.

We have chosen a common geographical definition of neighbouring communities based on a contiguity matrix where the value 1 is assigned if two jurisdictions share the same border and zero otherwise. This scheme is given by the weight matrix W^{neigh}. We define also an ethnical weight matrix W^{ethn} based on the ethnic proximity of the population. Ethnic proximity is defined as the probability that two individuals randomly drawn from two "communes" are from the same ethnic group. By this way, we test the existence of spending interactions between "communes" which are similar with respect to ethnicity.

We finally consider a possible weighting scheme in which weights are assumed to be identical for all "communes" j (W^{uni}). This uniform weighting scheme will give us a useful benchmark to ascertain whether the potential observed spatial auto-correlation can be attributed to a substantive strategic interaction process and not to a "common intellectual trend". Indeed, all previous theories rely on the common assumption that countries behave strategically with each others. Alternatively, Manski (1993) suggests that fiscal choices appear to be interdependent not because jurisdictions behave strategically but because they actually follow a "common intellectual trend" that drives fiscal choices in the same directions. So, we extend our analysis to determine whether these interdependencies are due to strategic interactions or just a common trend.

Finally, we present a dynamic version of the model. We introduce the lagged dependent variable, $S_{i;t-1}$, as a right hand side in order to take into account the persistency in public expenditures (see Veiga and Veiga (2007)).

The dynamic model can be written as followed:

$$S_{it} = \lambda S_{i;t-1} + \theta'_{ij}.A_{jt} + \beta.X_{it} + \alpha_i + \varepsilon_{it} \tag{6}$$

3.3 Econometric framework

In estimating this reaction function we are confronted to important econometric issues (Brueckner (2003)). First, because of strategic interactions, public expenditures in different jurisdictions are jointly determined: if local governments do react to each others' spending choices,

neighbours' decisions are endogenous and correlated with the error term ε_{it}. In this case, ordinary least squares estimation of the parameters are inconsistent, requiring alternate estimation method based on an instrumental variables (IV) method or on the maximum likelihood (ML). Secondly, the omission of explanatory variables that are spatially dependent may generate spatial dependence in the error term, which is given by: $\varepsilon_{it} = \tau W \varepsilon_{it} + v_{it}$. When spatial error dependence is ignored, estimation can provide false evidence of strategic interaction. To deal with this problem, one possible approach is to use ML estimator, taking into account the error structure (Case, Rosen, and Hines (1993)) or IV method which yields consistent estimations even with spatial error dependance (Kelejian and Prucha (1998))[9]. Brueckner (1998), Brueckner and Saavedra (2000), Saavedra (2000) and Foucault, Madies, and Paty (2008) use the tests of Anselin, Le Gallo, and Jayet (1996) to verifie the hypothesis of error independence. These tests are not contaminated by uncorrected spatial error dependence and can detect the presence of spatial lag dependence [10]. We can note that the use of panel helps to eliminate spatial error dependence which arises through spatial autocorrelation of omitted variable, since the influence of such variables is partly captured in community-specific intercept terms. Lastly, we introduce the lagged dependent variable as a right hand side. As the previous estimators are inconsistent in this case (Nickell (1981)), we propose to use the GMM-System estimator.

This method seems to be more appropriate. Indeed, the usual method of dealing with the country-specific effects, in the context of panel data, has been to work with first-order differences (Anderson and Hsiao (1980)). The GMM estimators allow controlling for both unobserved country-specific effects and potential endogeneity of the explanatory variables. Arellano and Bond (1991) present a first-difference GMM estimator. However, there are conceptual and statistical shortcomings with this estimator as the first difference estimator exacerbates the bias due to errors in variables (Hausman, Hall, and Griliches (1984)). Thus, we use an alternative system estimator that reduces the potential biases and imprecision associated with the usual difference estimators (Arellano and Bover (1995) and Blundell and Bond (1998)) and also greatly

[9] The estimation of the coefficient should not be biased but it would reduce the efficiency of the estimation and produced biaised standard errors.

[10] Indeed, Anselin, Le Gallo, and Jayet (1996) have proposed two robust tests based on the Lagrange Multiplier principle that indicate what is the most likely source of spatial dependence (spatial lag or spatial error dependence). These spatial tests require only the OLS residuals from a non-spatial model.

reduces the finite sample bias (Blundell, Bond, and Windmeijer (2000)). This estimator, called the GMM-System estimator, combines in one system, the regressions in difference and the regressions in level. Moreover, as there is some persistence of expenditures, it may be appropriate to use GMM-System Veiga and Veiga (2007). Basically, Blundell and Bond (1998) show that this extended GMM estimator is preferable to that of Arellano and Bond (1991) when the dependent variable, the independent variables, or both are persistent.

As the first challenge of empirical work is to ascertain that the observed spatial auto-correlation can be attributed to a substantive strategic interaction process and not to exogenous correlation in omitted jurisdictional characteristics or common shocks to local fiscal policy, we also introduce time dummies to capture shocks in each period which are common to all local governments and other specific controls.

$$S_{it} = \lambda S_{i;t-1} + \theta'_{ij}.A_{jt} + \beta_1.D_{it} + \beta_2.N_{dt} + \beta_3.O_{ct} + \alpha_i + \zeta_t + \varepsilon_{it}, \tag{7}$$

where S_{it} is per capita expenditures of "commune" i on year t, $S_{i;t-1}$ is the lagged value of our dependent variable, A_{jt} is the weighted average vector of per capita public spending in the set of the others local governments j at time t, D_{it} is the population density of jurisdiction i on year t, which captures the possibility of scale economies in public spending,[11] N_{dt} is the percentage of men who have a job in *département* d on year t, O_{ct} is a trade openness measure at country level. The employment rate, N_{dt}, is an indicator of the economic conjuncture and allows partly controlling for common shocks spacially correlated. The last variable, O_{ct}, allows controlling for macroeconomic common shocks, since developing countries are vulnerable to foreign trade. Moreover, it could have many effects on public finances[12].

[11] Population density is in units of persons per square kilometer. Per capita expenditures and population density are in log. Per capita expenditures are corrected for inflation.

[12] Rodrik (1998) shows that there exists a positive correlation between an economy's exposure to international trade and the size of its government because government spending plays a risk-reducing role in economies exposed to a significant amount of external risk. As Combes and Saadi-Sedik (2006) have shown, even if trade openness increases a country's exposure to external shocks and thereby adversely affects its budget balances, an outward looking policy strategy should lead to an overall strengthening of its budget balance. However, trade openness increases income inequalities (Savvides (1998)), which enhances the demand of public goods (Alesina and Perotti (1996)) and, simultaneously, reduces the ability of governments to collect taxes.

3.4 Extension

Until he stepped down in march 2006, Mathieu Kérékou enjoyed strong support in the north of the country (Alibori, Atacora, Borgou and Donga) which is considered as his fief.[13] Since Boni Yayi was elected, he affirmed its will of political opening. Municipal elections took place in April 2008. Parties allied with the president won a majority of local council seats, but the major cities in the south were all won by opposition parties. *Département* which can be considered as fief are extended to the south of the country, in particular, to Atlantic, Collines and Mono. Finally, for the whole of the period, about 40% of the counties have the same partisan affiliation as the president in office.

To test the effect to have the same partisan affiliation as the president in office, we extend our analysis including dummy variables for political affiliation. We also introduce dummy variables for election years to test opportunistic behaviour of local policymakers. So, the system of equation can be written as follow:

$$\begin{aligned} S_{it} = \quad & \lambda S_{i;t-1} + \theta'_{ij}.A_{jt} + \beta_1.D_{it} + \beta_2.N_{dt} + \beta_3.O_{ct} + \beta_4.T \\ & + \beta_5.PR_{it} + \beta_6.E_{t-1} + \beta_7.E_t + \beta_8.E_{t+1} + \alpha_i + \varepsilon_{it}, \end{aligned} \tag{8}$$

where T is a trend variable, which takes into account the common trend for local governments,[14] PR_{it} is a dummy variable which takes the value 1 if the local government i has the same political affiliation as the president in office and zero otherwise, E_{t-1} is a dummy variable, which takes the value 1 the year before the election and zero otherwise, E_t is a dummy variable, which takes the value 1 the year of the election and zero otherwise, E_{t+1} is a dummy variable, which takes the value 1 the year after the election and zero otherwise.[15]

We can note that we have a small number of observations for election years, so, results will only give us an indication for the existence of opportunistic behaviour but it will be difficult to conclude.

[13] Kérékou was born in 1933 in Kouarfa, in the north-west of the country.
[14] When we introduce dummy variables for election years we cannot introduce time dummies.
[15] Descriptive statistics are presented in Table A1.

3.5 Results

It is important to investigate whether the policy of a local jurisdiction is actually correlated with the policies of other jurisdictions and whether spatial lag or spatial error dependence are the more likely sources of correlation. Anselin, Bera, Florax, and Yoon (2006) have proposed two robust tests based on the Lagrange Mutiplier principle that indicate what is the most likely source of spatial dependence (spatial lag or spatial error dependence). We compute these robust tests for spatial lag dependence and for spatial error dependence which require only the OLS residuals from a non-spatial model. So, we first estimate (6) using OLS with specific-effects for both contiguity and ethnic matrix without taking into account the lagged value of our dependent variable ($\lambda = 0$) and the possible influence of the expenditures set by other jurisdictions ($\theta = 0$). The estimation results are shown in Table A2. Spatial tests indicate the presence of spatial lag dependence for public spending but not the existence of spatial error dependence for both matrixes.

We then estimate (6) using OLS with specific-effects for both contiguity and ethnic matrix without taking into account the lagged value of our dependent variable ($\lambda = 0$). We introduce the influence of the expenditures set by other jurisdictions ($\theta \neq 0$) without taking into account the endogeneity issues. The control variables are progressively introduced into the model to determine the robustness of our results. The estimation results are shown in Table A3 and A4. The coefficient of the weighted average vector of public expenditures in the set of the others local governments is always significant and positive, for both weight matrixes. Moreover, it remains relatively stable with the introduction of the control variables from (1) to (4). The population density coefficient is significant and positive. It do not indicate the presence of scale economies in public spending, as expected. In these first estimations, employment rate at the department level as well as partisan affiliation is positive but not significant. The trade openness indicator coefficient is, first, significantly positive but not robust with the introduction of control variables. Dummies associated with election years indicate, a priori, an opportunistic use of public spending during the year before the election. Indeed, current expenditures seem to increase during the year before the election and to decrease after. To understand the sign of

the coefficient associated with the election year dummy, one must be interested in the calendar of the elections and the vote of the budget. Local elections took place at the beginning of March and the definitive budget must be adopted only before March 31. Therefore, the year before the elections, political decision-makers increase current expenditures and those decrease the following year since the definitive budget is voted only after the elections.

As the neighbours'spending decisions are endogenous and correlated with the error term, we then estimate with GMM-System the dynamic model (6) for all weighting schemes taking into account the lagged value of our dependent variable ($\lambda = 0$). The GMM estimator controls for both unobserved specific effects and endogeneity of the explanatory variables. We adopt the assumption of weak exogeneity of the employment rate and the trade openness, in the sense that they are assumed uncorrelated with future realizations of the error terms. Other explanatory variables[16] are assumed to be stricty exogene and the weighted average vector of per capita public spending of the others local governments is, as noted before, suspected for endogeneity. The lagged levels of the variables are used as instruments in the regressions in level as well as in the regressions in difference. Table 1 shows these estimation results.

[16] Population density, time dummies, elections dummies, partisan affiliation, trend.

Table 1: Estimation results for current expenditures - GMM-System

Dependent variable: current expenditures of commune i ($S_{i;t}$)						
Weighting scheme	(1)W^{neigh}	(2)W^{ethn}	(3)W^{uni}	(4)W^{ethn}	(5)W^{neigh2}	(6)W^{ethn2}
Lagged dep. var.	0.620**	0.615***	0.479*	0.630***	0.997***	0.646***
	(0.26)	(0.20)	(0.28)	(0.21)	(0.24)	(0.21)
Spending in communes j	0.788***	0.337**	-2.203	0.332**	0.978***	0.264**
	(0.28)	(0.17)	(3.48)	(0.16)	(0.23)	(0.14)
Population density	0.043	0.193**	0.188**	0.053	0.051	0.159*
	(0.11)	(0.11)	(0.10)	(0.11)	(0.11)	(0.11)
Employment rate	0.036**	0.021**	0.036*	0.035***	0.047***	0.020**
	(0.16)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Trade openess	-0.099	-0.117	-0.265	-0.100	-0.219***	-0.123*
	(0.07)	(0.07)	(0.28)	(0.06)	(0.08)	(0.07)
Partisan Affiliation	0.341*	0.463*	0.195	0.622**	0.308*	0.368*
	(0.18)	(0.28)	(0.17)	(0.24)	(0.13)	(0.21)
Trend	-0.407***	-0.343***	-0.849	-0.334***	-0.547***	-0.379***
	(0.06)	(0.09)	(0.68)	(0.08)	(0.08)	(0.06)
Election year t-1	0.346***	0.344***	0.303*	0.272**	0.451***	0.370***
	(0.11)	(0.13)	(0.15)	(0.12)	(0.11)	(0.11)
Election year t	0.305	-0.633**	-0.141	0.621*	0.921**	-0.615
	(0.50)	(0.29)	(0.25)	(0.29)	(0.46)	(0.40)
Spending in neighbours j				0.768***		
				(0.17)		
AR(1) test: p-value	0.007	0.001	0.027	0.002	0.001	0.001
AR(2) test: p-value	0.521	0.101	0.121	0.558	0.825	0.109
Hansen test: p-value	0.795	0.200	0.432	0.955	0.747	0.182
N	261	261	261	261	257	256

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

The consistency of the estimator depends on whether lagged values of explanatory variables are valid instruments. The criteria for the selection of instruments are two specification tests (Arellano and Bond (1991)).With the Hansen test, we test the null hypothesis of the overall validity of instruments' orthogonality conditions (over-identifying restrictions). The second test is about the serial correlation of residuals. It examines the hypothesis that the residuals from the first-differenced estimating equation are not second-order correlated. Firstly, we test the null hypothesis of no first-order serial correlation of differenced residuals (AR (1) test) and secondly, the null hypothesis of no second-order serial correlation of differenced residuals (AR (2) test). If we reject the null hypothesis of no first-order serial correlation and do not reject the null hypothesis of no second-order serial correlation of differenced residuals, the residuals are serially uncorrelated and we conclude that orthogonality conditions are correct. In our case, both statistics confirm the validity of the instruments used.

We focus our attention on (1) (2) and (3), the GMM-System estimations for contiguity, ethnic and uniform matrix. We can first note that the coefficient on lagged dependent variable is always significant and positive. As the coefficient on lagged public spending provide an estimate λ varying between 0.491 and 0.591, the result indicates some level of persistency in public expenditures which are likely to change sorely over time. Moreover, it confirms the consistency of the autoregressive specification. After correction for endogeneity, the coefficient of the weighted average vector of public expenditures in the set of the others local governments is significant at least at 5% level and positive, for ethnic and contiguity matrix. At this stage, we cannot conclude that there are some strategic spending interactions because, as Manski (1993) suggests, fiscal choices can be interdependent not because jurisdictions behave strategically but because they follow a "common intellectual trend". However, if this is only a common trend that drives local governments in the same direction, we should expect a positive sign of the interaction coefficient but not a specific pattern in the type of "communes" which whom to interact. As the coefficient of interaction with the uniform matrix is not significant, we can say that there are some strategic interactions between neighbouring jurisdictions and that these interactions also exist between "communes" which are close with respect to ethnic composition.

Furthermore, public expenditures seem to be strategic complements. An average public spending increase of 10% in the neighbouring municipalities induces an increase of around 7.8% in local primary expenditure. We find a smaller coefficient (0.337) for ethnic matrix suggesting the existence of stronger interactions among neighbouring communes than among ethnically close one. Moreover, since different ethnic groups are located in closed geographical areas, we can think that geographic matrix overlie ethnic matrix. However, in column (4), when we estimate the coefficient for ethnic matrix after controling for geographical interactions, it remains significant and stable. So, even if geographical distance remains more relevent to explain interjurisdictional competition, there exists interactions among ethnically closed communes.

While the parameter associated with population density remains positive and generally significant, this is not the case for the coefficient of trade openness is not significant. As some of these effects offset each other, it is often difficult to predict the net effect of trade openess on public expenditures which is not significant. We find a positive and significant sign for the parameter associated with the employment rate, which indicates the effect of economic conjuncture. The trend variable is, as expected, significant and negative. Indeed, per capita public expenditures have decreased by 75% during the period despite a little growth between 2003 and 2004. There seems to be an opportunistic behaviour of local jurisdictions since dummies associated with the year before election indicate an increase of public spending. So, we find some evidence of a political budget cycle for current expenditures in this young democracy [17]. However, as we noted before, it is difficult to conclude since we have a small number of observations. It appears also that being ruled by a local government which has the same political affiliation as the president in office, determines higher public expenditures. Indeed, the coefficient of the dummy variable which indicates if the local government has the same political affiliation as the president in office is always significant for both matrices.

In column (5) and (6), we ascertain the robustness of these results by estimating the same econometric model with by alternatives matrices. The W^{neigh2} matrix, in which the value 1 is assigned if two communes belong to the same county (*départements*) and zero otherwise, is a

[17] Shi and Svensson (2006) have shown that political budget cycles are much larger in young democracies than in developed countries, in particular in countries with weak institutional constraints on incumbents' rent-seeking ability

proxy of the contiguity matrix. Indeed, two "communes" which belong to the same county are generally close. The W^{ethn2} matrix is defined as follow: the value 1 is assigned if two "communes" have the same dominant ethnic group and zero otherwise. The coefficient of the weighted average vector of public expenditures in the set of the others local governments remains positive and significant at 5% level for the W^{neigh2} matrix but only at 10% for the ethnic matrix W^{ethn2}. These estimations tend to confirm, in addition, the existence of opportunistic behaviour of local jurisdiction and the effect of partisane affiliation.

At this stage, our results suggest that decentralization has induced interjurisdictional competition. Indeed, there are some strategic interactions between Beninese local governments as regards current expenditures which appear to be strategic complements. These interdependences exist between neighbouring "communes" but also between those which are close with respect to ethnic composition. Moreover, estimations tend to show that local government adopt an opportunistic behaviour before elections. Lastly, "communes" where local government has the same political affiliation as the president enjoy higher public spending.

4 Is there "yardstick competition"?

As we noted before, an argument in favor of decentralization is that local governments will be more subject to electoral pressure from local citizens. In particular, whenever there are information asymmetries between voters and politicians, voters can use the performance cues of other governments as a benchmark to judge whether their representative wastes resources and deserves to remain in office. Lost resources cannot be observed by voters, but their extent is evaluated by comparisons to other jurisdictions. Thus, an action chosen by a politician in one jurisdiction affects the informational set of imperfectly informed voters in other jurisdictions. This "yardstick competition" may yield fiscal mimicking forms of behaviour since increasing expenditures in one jurisdiction may induce neighbouring politicians to do the same in order not to be signaled as bad incumbents. The second challenge of empirical work consists in evaluating the real electoral pressure induced by decentralization by identifying the presence of this type of interjurisdictional competition.

Even if there are various theories of fiscal policy interdependencies, when we want to empirically test the theory, the common way to proceed is to estimate the parameters of the reaction function which indicate whether any jurisdiction will change the public spending level in response to changes in the same variable by other jurisdictions. It is not possible to distinguish the nature of these interdependencies. A lot of studies are agnostic about the sources of the interactions.[18] They recognise that "welfare competition" may be one source but that "yardstick competition" or some other type of behaviour related to spillovers may also generate strategic interactions: they refer to interactions as "mimicking".

The literature on "welfare competition" analyses income redistribution by governments when the poor migrate in response to differentials in welfare benefits. In such models, jurisdictions choose benefit levels in strategic fashion by taking account the mobility of the poor. Actually, the inflow of the poor caused by a higher transfer tends to moderate the incentive for redistribution (Brueckner (2003)). Most of these papers are based on US dataset.[19] Bardhan (2002) emphasizes that the "institutional context in developing and transition economies is quite different from those in advanced industrial economies, and this necessitates the literature on decentralization in the context of development to go beyond the traditional fiscal federalism literature." In particular, the Tiebout model cannot be applied to developing countries where the population mobility is very limited and not decided according to public spending. Thus, the relevance of the "welfare competition" model, in which individuals has to be mobile, is reduced. A "yardstick competition" is, however, possible given that it is likely that policy comparison occurs with respect to geographically close "communes" and "communes" with similar characteristics (like ethnicity), and, both contiguity and ethnic matrix perform in our estimations.

"Yardstick competition" relies on the idea that incumbent governments aim at being re-elected and are willing to mimic neighbouring jurisdictions' policies in order to remain in office. If re-election concerns are the main force driving strategic interaction in local policy making, then analysing the fiscal setting behaviour of local governments in different circumstances with

[18] Brett and Pinkse (1998), Buettner (2001), Hayashi and Boadway (2001),Ladd (1992)

[19] Case, Rosen, and Hines (1993), Figlio, Kolpin, and Reid (1999), Saavedra (2000).For instance, Figlio, Kolpin, and Reid (1999) find substantial empirical evidence that is supportive of the notion of "welfare competition" using a panel of state-level annual data from 1983 to 1994 for each of the contiguous United States and the District of Columbia.

respect to their electoral prospects should help. Indeed, interactions should be higher in election periods since policymakers are particularly concerned about the neighbouring incumbents in the elections period (Besley and Case (1995)). So, we use the election cycle variables to test the hypothesis that interactions may be stronger in election periods, following Sole Olle (2003), Redoano (2007) and Foucault, Madies, and Paty (2008). A straightforward way to test this is to interact the neighbours' spending decisions (A_{jt}) with the election years dummy, EY (E_{t-1} and E_t) and estimate two different interaction coefficients, one for years of election ($A_{jt} \times EY$) and one for all the other periods, NEY, ($A_{jt} \times (1 - EY)$).

$$\begin{aligned} S_{it} = \quad & \lambda S_{i;t-1} + \theta'_{ij}.(A_{jt} \times EY) + \theta''_{ij}.(A_{jt} \times NEY) + \beta_1.D_{it} + \beta_2.N_{dt} \\ & + \beta_3.O_{ct} + \beta_4.T + \beta_5.PR_{it} + \beta_6.EY + \beta_7.NEY + \alpha_i + \varepsilon_{it} \end{aligned} \tag{9}$$

where $EY = E_{t-1} + E_t$ and $NEY = (1 - (E_{t-1} + E_t))$

If the hypothesis of "yardstick competition" were true, we should observe the coefficient of $(A_{jt} \times EY)$ being more significant and higher than the coefficient of $(A_{jt} \times NEY)$ as policymakers should be particularly concerned about their neighbours' decisions in the period of elections.

Table 2: Testing for yardstick competition - GMM-System

Dependent variable: current expenditures of "commune" i				
Weighting scheme	(1)W^{neigh}	(2)W^{ethn}	(3)W^{neigh2}	(4)W^{ethn2}
Spending in non election years	0.642***	0.911***	0.694**	0.352***
	(0.15)	(0.19)	(0.32)	(0.11)
Spending in election years	0.715***	1.023***	0.865***	0.414***
	(0.14)	(0.19)	(0.17)	(0.10)
Lagged dep. var.	0.253***	0.631***	0.749**	1.087***
	(0.03)	(0.23)	(0.29)	(0.19)
Population density	0.244**	0.207*	0.139	-0.071
	(0.11)	(0.11)	(0.12)	(0.10)
Employment rate	0.041**	0.020*	0.041***	0.009
	(0.01)	(0.01)	(0.01)	(0.01)
Trade openess	0.157*	0.034	-0.239***	-0.138
	(0.08)	(0.073)	(0.08)	(0.09)
Partisan Affiliation	0.606**	1.229***	0.346	0.202
	(0.25)	(0.26)	(0.23)	(0.23)
Trend	-0.465***	-0.271**	-0.466***	-0.569**
	(0.09)	(0.13)	(0.99)	(0.08)
Election years	1.079*	1.781*	0.946	0.200
	(0.63)	(0.58)	(1.26)	(0.73)
AR(1) test: p-value	0.004	0.001	0.002	0.000
AR(2) test: p-value	0.419	0.184	0.874	0.294
Hansen test: p-value	0.184	0.126	0.248	0.001
N	261	261	257	256

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

We can note that significant coefficients have the same sign as in previous estimations and that statistics confirm the validity of instruments used. So, we focus our analysis on the compar-

ison of the interaction term coefficients. As expected, the coefficient is lightly higher and more significant in election period than in other periods with the contiguity matrix. So, current expenditures setting is a little bit more dependent on neighbours in the period of election. However, with the ethnic matrix, there is no apparent sign of "yardstick competition" since the election years interaction coefficient is higher than the non-election ones but not more significant.

With the both alternative matrices the coefficient is lightly higher and more significant in the period of election than in other periods. Actually, results provide some evidence for the presence of "yardstick competition". It may be one source of interactions. However, as interaction coefficient remains significant in the non-election period, other theoretical models can generate the observed spatial pattern. The fact that policymakers seem to be particularly concerned about their neighbours' decisions in the period of elections tends to confirm the presence of "yardstick competition" but not to reject other sources of spending strategic interactions.

5 Conclusion

Decentralization has been advocated to improve the performance of the public sector by stimulating interjurisdictional competition, by forcing local governments to compete for constituents and to provide local public goods more efficiently. Thus, a necessary assumption for the efficiency of decentralization is the existence of such interjurisdictional competition. Our work complements the literature on decentralization by analysing this aspect of decentralization. By testing the existence of spending strategic interactions between Beninese local governments, we analyse whether decentralization has actually induced competition between local jurisdictions, which is a channel through which decentralization may affect the performance of provision of public goods. The originality of our project consists in reasoning from an African case in which decentralization has been recently implemented and to pay attention to economic, political and cultural dimensions of fiscal federalism.

We have first developed a rigourous theoretical model of spending strategic interactions. Then, taking econometric issues into account, we have estimated a dynamic panel data model. Our empirical analysis provides evidence for the presence of strategic interactions between Beni-

nese local governments as regards current expenditures: public spending seems to be strategic complements. Moreover, these interactions also exist between "communes" which are close with respect to ethnic composition. We can finally say that decentralization has induced interjurisdictional competition and that this African democracies which experiment decentralization is concerned with fiscal strategic interactions as developed democracies. Furthermore, local governments seem to adopt an opportunistic behaviour before elections by increasing public spending. We have also found that "communes" in which local government has the same political affiliation as the president enjoy higher public spending. The study of fiscal setting behaviour of local governments in the election period tends to show that "yardstick competition" may be one source of interdependencies. It confirms that beninese local governments are subject to interjurisdictional competition and, to electoral pressure.

References

Akin, J., P. Hutchinson, and K. Strumpf (2005): "Decentralisation and government provision of public goods: The public health sector in Uganda," *The Journal of Development Studies*, 41(8), 1417–1443.

Alderman, H. (2002): "Do local officials know something we don't? Decentralization of targeted transfers in Albania," *Journal of Public Economics*, 83(3), 375–404.

Alesina, A., and R. Perotti (1996): "Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects," NBER Working Papers 5730, National Bureau of Economic Research, Inc.

Anderson, T. W., and C. Hsiao (1980): "Estimation of Dynamic Models with Error Components," Working Papers 336, California Institute of Technology, Division of the Humanities and Social Sciences.

Anselin, L., A. K. Bera, R. Florax, and M. J. Yoon (2006): "Spatial econometrics and panel data models. In L. Matyas P. Sevestre (Eds.)," *Handbook of panel data econometricseconometrics. Dordrecht: Kluwer.*

Anselin, L., J. Le Gallo, and H. Jayet (1996): "Simple diagnostic tests for spatial dependence," *Regional Science and Urban Economics*, 26(1), 77–104.

Arellano, M., and S. Bond (1991): "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies*, 58(2), 277–97.

Arellano, M., and O. Bover (1995): "Another look at the instrumental variable estimation of error-components models," *Journal of Econometrics*, 68(1), 29–51.

Aschauer, D. A., and J. Greenwood (1985): "Macroeconomic effects of fiscal policy," *Carnegie-Rochester Conference Series on Public Policy*, 23(1), 91–138.

Bahl, R., and J. Linn (1994): "Fiscal Decentralization and Intergovernmental Transfers in Less Developed Countries," *The Journal of Federalism*, 24, 1–18.

Bardhan, P. (2002): "Decentralization of Governance and Development," *Journal of Economic Perspectives*, 16(4), 185–205.

Bardhan, P., and D. Mookherjee (2005): "Decentralizing antipoverty program delivery in developing countries," *Journal of Public Economics*, 89(4), 675–704.

Barro, R. J. (1990): "Government Spending in a Simple Model of Endogenous Growth," *Journal of Political Economy*, 98(5), S103–26.

Besley, T., and A. Case (1995): "Incumbent Behavior: Vote-Seeking, Tax-Setting, and Yardstick Competition," *American Economic Review*, 85(1), 25–45.

Bird, R. M., and E. Rodriguez (1999): "Decentralization and poverty alleviation. International experience and the case of the Philippines," *Public Administration and Development*, 19, 299–319.

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

Blundell, R., S. Bond, and F. Windmeijer (2000): "Estimation in dynamic panel data models: improving on the performance of the standard GMM estimator," IFS Working Papers W00/12, Institute for Fiscal Studies.

Brett, C., and J. Pinkse (1998): "The Determinants of Municipal Tax Rates in British Columbia," UBC Departmental Archives 98-03, UBC Department of Economics.

Brueckner, J. K. (1998): "Testing for Strategic Interaction Among Local Governments: The Case of Growth Controls," *Journal of Urban Economics*, 44(3), 438–467.

——— (2003): "Strategic Interaction Among Governments: An Overview of Empirical Studies," *International Regional Science Review*, 26(2), 175–188.

Brueckner, J. K., and L. A. Saavedra (2000): "Do Local Governments Engage in Strategic Property-Tax Competition?," Econometric Society World Congress 2000 Contributed Papers 0357, Econometric Society.

Bucovetsky, S. (2005): "Public input competition," *Journal of Public Economics*, 89(9-10), 1763–1787.

Buettner, T. (2001): "Local business taxation and competition for capital: the choice of the tax rate," *Regional Science and Urban Economics*, 31(2-3), 215–245.

Bulow, J. I., J. D. Geanakoplos, and P. D. Klemperer (1985): "Multimarket Oligopoly: Strategic Substitutes and Complements," *Journal of Political Economy*, 93(3), 488–511.

Caputo, M. R. (1996): "The Envelope Theorem and Comparative Statics of Nash Equilibria," *Games and Economic Behavior*, 13(2), 201–224.

Case, A. C., H. S. Rosen, and J. J. Hines (1993): "Budget spillovers and fiscal policy interdependence : Evidence from the states," *Journal of Public Economics*, 52(3), 285–307.

Combes, J.-L., and T. Saadi-Sedik (2006): "How does trade openness influence budget deficits in developing countries?," *Journal of Development Studies*, 42(8), 1401–1416.

Faguet, J.-P. (2004): "Does decentralization increase government responsiveness to local needs?: Evidence from Bolivia," *Journal of Public Economics*, 88(3-4), 867–893.

Figlio, D. N., V. W. Kolpin, and W. E. Reid (1999): "Do States Play Welfare Games?," *Journal of Urban Economics*, 46(3), 437–454.

Foucault, M., T. Madies, and S. Paty (2008): "Public spending interactions and local politics. Empirical evidence from French municipalities," *Public Choice*, 137(1), 57–80.

Galasso, E., and M. Ravallion (2005): "Decentralized targeting of an antipoverty program," *Journal of Public Economics*, 89(4), 705–727.

Hausman, J., B. H. Hall, and Z. Griliches (1984): "Econometric Models for Count Data with an Application to the Patents-R&D Relationship," *Econometrica*, 52(4), 909–38.

Hayashi, M., and R. Boadway (2001): "An empirical analysis of intergovernmental tax interaction: the case of business income taxes in Canada," *Canadian Journal of Economics*, 34, 481–503.

Jütting, J. P., C. Kauffmann, I. McDonnell, H. Osterrieder, N. Pinaud, and L. Wegner (2004): "Decentralisation and Poverty in Developing Countries: Exploring the Impact," OECD Development Centre Working Papers 236, OECD Development Centre.

Keen, M., and M. Marchand (1997): "Fiscal competition and the pattern of public spending," *Journal of Public Economics*, 66(1), 33–53.

Kelejian, H. H., and I. R. Prucha (1998): "A Generalized Spatial Two-Stage Least Squares Procedure for Estimating a Spatial Autoregressive Model with Autoregressive Disturbances," *The Journal of Real Estate Finance and Economics*, 17(1), 99–121.

Klugman, J. (1997): "Decentralization: a Survey from a Child Welfare Perspective," Innocenti Occasional Papers, Economic Policy Series iopeps97/6, UNICEF Innocenti Research Centre.

Ladd, H. (1992): "Mimicking of local tax burdens among neighboring countries," *Public Finance Quarterly*, 20, 450–467.

Langley, P., A. Mondjanagni, B. Fadé, J. E. Gbédo, A. B. Zourkaïnény, and A. Moussiliou (2005): "Les premiers pas des communes au Bénin : Enseignements du processus de la décentralisation," Amsterdam : KIT Politiques et Pratiques du Développement Bulletin 371.

Manski, C. F. (1993): "Identification of Endogenous Social Effects: The Reflection Problem," *Review of Economic Studies*, 60(3), 531–42.

Nickell, S. J. (1981): "Biases in Dynamic Models with Fixed Effects," *Econometrica*, 49(6), 1417–26.

Oates, W. E. (1972): "Fiscal Federalism," *New York: Harcourt Brace Jovanovich*.

Prud'homme, R. (1995): "The Dangers of Decentralization," *World Bank Research Observer*, 10(2), 201–20.

Redoano, M. (2007): "Fiscal Interactions Among European Countries. Does the EU Matter?," CESifo Working Paper Series CESifo Working Paper No., CESifo GmbH.

Rodrik, D. (1998): "Why Do More Open Economies Have Bigger Governments?," *Journal of Political Economy*, 106(5), 997–1032.

Saavedra, L. A. (2000): "A Model of Welfare Competition with Evidence from AFDC," *Journal of Urban Economics*, 47(2), 248–279.

Savvides, A. (1998): "Trade policy and income inequality: new evidence," *Economics Letters*, 61(3), 365–372.

Shi, M., and J. Svensson (2006): "Political budget cycles: Do they differ across countries and why?," *Journal of Public Economics*, 90(8-9), 1367–1389.

Sole Olle, A. (2003): "Electoral accountability and tax mimicking: the effects of electoral margins, coalition government, and ideology," *European Journal of Political Economy*, 19(4), 685–713.

Tiebout, C. M. (1961): "An Economic Theory of Fiscal Decentralization, in: National Bureau Of Economic Research (Ed.)," *Public Finances: Needs, Sources and Utilization*.

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

A Appendix

A.1 Comparative statics

A.1.1 A change in θ_i

If jurisdiction i is constrained, then it is obvious that $\frac{\partial g_i}{\partial \theta_j} = 0$; otherwise, we differentiate the system of the FOCs with respect to θ_j. We have:

$$\begin{cases} \left[-\frac{d^2c(g_i)}{dg_i^2} + v_{11}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right)\right]\frac{\partial \widetilde{g}_i(\theta)}{\partial \theta_i} + v_{12}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right)\frac{\partial g_j^*(\theta)}{\partial \theta_i} + v_{1\theta_i}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right) = 0 \\ \left[-\frac{d^2c(g_j)}{dg_j^2} + v_{11}^j\left(\widetilde{g}_j(\theta), g_i^*(\theta); \theta_j\right)\right]\frac{\partial \widetilde{g}_j(\theta)}{\partial \theta_i} + v_{12}^j\left(\widetilde{g}_j(\theta), g_i^*(\theta); \theta_j\right)\frac{\partial g_i^*(\theta)}{\partial \theta_i} = 0 \end{cases} \tag{10}$$

If $g_i^*(\theta) = \widetilde{g}_i(\theta)$ and $g_j^*(\theta) = \widetilde{g}_j(\theta)$, the system (10) is equivalent to the following matrix form:

$$\begin{pmatrix} V_{11}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right) & v_{12}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right) \\ v_{12}^j\left(\widetilde{g}_i(\theta), g_i^*(\theta); \theta_j\right) & V_{11}^j\left(\widetilde{g}_j(\theta), g_i^*(\theta); \theta_j\right) \end{pmatrix} \begin{pmatrix} \frac{\partial g_i^*(\theta)}{\partial \theta_i} \\ \frac{\partial g_j^*(\theta)}{\partial \theta_i} \end{pmatrix} = \begin{pmatrix} -v_{1\theta_i}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right) \\ 0 \end{pmatrix}.$$

Applying the Cramer rule yields to:

$$\begin{aligned} \frac{\partial g_i^*(\theta)}{\partial \theta_i} &= \frac{\begin{vmatrix} -v_{1\theta_i}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right) & v_{12}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right) \\ 0 & V_{11}^j\left(\widetilde{g}_j(\theta), g_i^*(\theta); \theta_j\right) \end{vmatrix}}{D} \\ &= \frac{-v_{1\theta}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta\right) V_{11}^j\left(\widetilde{g}_j(\theta), g_i^*(\theta); \theta_j\right)}{D} \\ \frac{\partial g_j^*(\theta)}{\partial \theta_i} &= \frac{\begin{vmatrix} V_{11}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right) & -v_{1\theta_i}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right) \\ v_{12}^j\left(\widetilde{g}_i(\theta), g_i^*(\theta); \theta_j\right) & 0 \end{vmatrix}}{D} \\ &= \frac{v_{1\theta_i}^i\left(\widetilde{g}_i(\theta), g_j^*(\theta); \theta_i\right) v_{12}^j\left(\widetilde{g}_i(\theta), g_i^*(\theta); \theta_j\right)}{D} \end{aligned}$$

where

$$\begin{aligned} D &= \begin{vmatrix} V_{11}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta_i\right) & v_{12}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta_i\right) \\ v_{12}^{j}\left(\widetilde{g}_i(\theta), g_i^*(\theta);\theta_j\right) & V_{11}^{j}\left(\widetilde{g}_j(\theta), g_i^*(\theta);\theta_j\right) \end{vmatrix} \\ &= V_{11}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta_i\right) V_{11}^{j}\left(\widetilde{g}_j(\theta), g_i^*(\theta);\theta_j\right) - v_{12}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta_i\right) v_{12}^{j}\left(\widetilde{g}_i(\theta), g_i^*(\theta);\theta_j\right) \end{aligned}$$

The sign of D remains indeterminate (see Caputo, 1996).

Since by assumption: $sign\left\{v_{1\theta}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta\right)\right\} = sign\left\{v_{1\theta_i}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta_i\right)\right\}$, we have

$$\begin{aligned} sign\left\{\frac{\partial g_i^*(\theta)}{\partial \theta_i}\right\} &= sign\left\{\frac{\partial g_j^*(\theta)}{\partial \theta_i}\right\} \quad if \quad v_{12}^{j}\left(\widetilde{g}_i(\theta), g_i^*(\theta);\theta_j\right) > 0 \\ sign\left\{\frac{\partial g_i^*(\theta)}{\partial \theta_i}\right\} &= sign\left\{-\frac{\partial g_j^*(\theta)}{\partial \theta_i}\right\} \quad if \quad v_{12}^{j}\left(\widetilde{g}_i(\theta), g_i^*(\theta);\theta_j\right) < 0 \end{aligned}$$

If one of both solutions $\left(g_{i,j}^*(\theta) = \overline{g}_{i,j}\right)$ is constrained, then we have $\frac{\partial g_i^*(\theta)}{\partial \theta_i} = \frac{\partial g_j^*(\theta)}{\partial \theta_i} = 0$.

A.1.2 A change in $\theta_i = \theta_j = \theta$

If we consider that $\theta_i = \theta_j = \widetilde{\theta}$ and $v_{1\theta}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta\right) = v_{1\theta}^{j}\left(\widetilde{g}_j(\theta), g_i^*(\theta);\theta\right)$, the direct effect of a variation of the degree of spillovers on the marginal utility of the public good is identical in each jurisdiction. Similar computations involve

$$\begin{aligned} \frac{\partial g_i^*(\theta)}{\partial \theta} &= \frac{\begin{vmatrix} -v_{1\theta}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta\right) & v_{12}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta\right) \\ -v_{1\theta}^{j}\left(\widetilde{g}_j(\theta), g_i^*(\theta);\theta\right) & V_{11}^{j}\left(\widetilde{g}_j(\theta), g_i^*(\theta);\theta\right) \end{vmatrix}}{D} \\ &= \frac{v_{1\theta}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta\right)}{D}\left(v_{12}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta\right) - V_{11}^{j}\left(\widetilde{g}_j(\theta), g_i^*(\theta);\theta\right)\right) \\ \frac{\partial g_j^*(\theta)}{\partial \theta} &= \frac{\begin{vmatrix} V_{11}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta\right) & -v_{1\theta_i}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta\right) \\ v_{12}^{j}\left(\widetilde{g}_i(\theta), g_i^*(\theta);\theta\right) & -v_{1\theta}^{j}\left(\widetilde{g}_j(\theta), g_i^*(\theta);\theta\right) \end{vmatrix}}{D} \\ &= \frac{v_{1\theta}^{j}\left(\widetilde{g}_j(\theta), g_i^*(\theta);\theta\right)}{D}\left(v_{12}^{j}\left(\widetilde{g}_i(\theta), g_i^*(\theta);\theta_j\right) - V_{11}^{i}\left(\widetilde{g}_i(\theta), g_j^*(\theta);\theta\right)\right) \end{aligned}$$

$$sign\left(\frac{\partial g_j^*(\theta)}{\partial \theta}\right) = sign\left(\frac{\partial g_j^*(\theta)}{\partial \theta}\right)$$

A.2 Tables

Table A1: Descriptive statistics

Variables	Obs.	Mean	Std. dev.	Min	Max
Current expenditures	448	2915	10934	15.06 (Basilla)	123779 (Cotonou)
Population density	378	334.94	1019.25	7.61 (Tanguieta)	7684 (Cotonou)
Employment rate	462	26.67	10.68	3.46 (Kandi)	59.40 (Cotonou)
Trade openess	462	39.14	0.81	37.95 (2003)	40.20 (2008)
Partisan affiliation	462	0.38	0.48	0	1

Table A2: Estimation results for LM tests - Specific effects

Dependent variable: current expenditures of "commune" i ($S_{i;t}$)		
Weighting scheme	(1) W^{neigh}	(2) W^{ethn}
Population density	0.372***	0.372***
	(0.09)	(0.09)
Employment rate	0.017*	0.017*
	(0.01)	(0.01)
Trade openess	0.032	0.032
	(0.04)	(0.04)
Partisan Affiliation	0.191	0.191
	(0.21)	(0.21)
Trend	-0.168***	-0.168***
	(0.05)	(0.05)
Election year t-1	0.201***	0.201***
	(0.06)	(0.06)
Election year t	-1.499***	-1.499***
	(0.15)	(0.15)
Election year t+1	-0.594***	-0.594***
	(0.07)	(0.07)
LMlag (p-value)	13.33	11.97
	(0.001)	(0.005)
LMerr (p-value)	1.35	0.60
	(0.25)	(0.43)

Table A3: Estimation results with spatial lag dependence - Specific effects

Dependent variable: current expenditures of "commune" i ($S_{i;t}$)				
Weighting scheme	(1)W^{neigh}	(2)W^{neigh}	(3)W^{neigh}	(4)W^{neigh}
Spending in city j	0.476***	0.508***	0.318***	0.318***
	(0.10)	(0.15)	(0.09)	(0.09)
Population density		0.256**	0.332***	0.332***
		(0.08)	(0.09)	(0.09)
Employment rate		0.009	0.015	0.015
		(0.01)	(0.01)	(0.01)
Trade openess		0.462*	0.666***	0.036
		(0.18)	(0.12)	(0.04)
Partisan Affiliation			0.140	0.140
			(0.20)	(0.20)
Trend				-0.168***
				(0.05)
Election year t-1				0.176***
				(0.05)
Election year t				-0.980***
				(0.18)
Election year t+1				-0.450***
				(0.08)
Hausman test: p-value	0.998	0.819	0.959	0.959
N	448	366	324	324

Robust standard errors are in brackets.***: coefficient significant at 1 % level, **: at 5 % level, *: at 10 % level.. Time dummies are introduced from (1) to (3) but not shown in the Table.

Table A4: Estimation results with spatial lag dependence - Specific effects

Dependent variable: current expenditures of "commune" i ($S_{i;t}$)				
Weighting scheme	(1)W^{ethn}	(2)W^{ethn}	(3)W^{ethn}	(4)W^{ethn}
Spending in city j	0.437***	0.364**	0.308**	0.308**
	(0.09)	(0.14)	(0.16)	(0.16)
Population density		0.321***	0.344***	0.344***
		(0.08)	(0.09)	(0.09)
Employment rate		0.004	0.016	0.016
		(0.01)	(0.01)	(0.01)
Trade openess		0.578***	0.659***	0.046
		(0.17)	(0.19)	(0.04)
Partisan Affiliation			0.114	0.114
			(0.22)	(0.22)
Trend				-0.145**
				(0.06)
Election year t-1				0.140**
				(0.06)
Election year t				-1.128***
				(0.24)
Election year t+1				-0.479***
				(0.08)
Hausman test: p-value	0.998	0.462	0.993	0.999
N	430	366	324	324

Robust standard errors are in brackets.***: coefficient significant at 1 % level, **: at 5 % level, *: at 10 % level.. Time dummies are introduced from (1) to (3) but not shown in the Table.