

Torres, Fabio Sanchez; Eljaiek, Irina España; Gonzalez, Jannet Zenteno

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## Sub-national Revenue Mobilization in Latin American and Caribbean Countries: The Case of Colombia

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## **The Case of Colombia**

Fabio Sánchez Torres  
Irina España Eljaiek  
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**Inter-American Development Bank**  
Department of Research and Chief Economist

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Fabio Sánchez Torres  
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Universidad de los Andes



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## **Abstract\***

This paper surveys the evolution and implications of fiscal decentralization in Colombia in recent decades. After describing the fiscal decentralization process and its impact on sub-national finances, the paper presents the evolution of departmental public finances, departmental vertical imbalances and the proposal to levy a VAT surcharge and a retail sales tax for the departments. The paper subsequently describes the evolution of municipal finances and municipal vertical imbalances, then includes calculations of the effective rates of the property and land tax and the industry and commerce tax, estimating the municipal tax burden, the efficiency rate of tax collection, and the determinants of both. The paper concludes with policy recommendations.

**JEL classification:** H3, H7, H71

**Keywords:** Sub-national revenue, Value-added tax, Income tax, Tax collection, Colombia

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## **1. Introduction**

Trends in Colombian sub-national public finances in departments and municipalities during the last 20 years have been linked to the evolution of fiscal decentralization. Fiscal decentralization is the transfer of financial resources from the central government to sub-national governments (SNGs)—both departmental (regional) and municipal (local)—together with an enhanced ability to generate own resources by SNGs in order to finance public goods provided at the regional or the local level. The current approach to decentralization holds that SNGs need to generate or mobilize own resources so that they will be able to deliver regional and local public goods with greater responsiveness and efficiency, which will foster regional and local economic prosperity (Weingast, 2009).

In the last 15 years, departments and municipalities have taken different paths to fiscal decentralization. While the departments have generated very little additional own resources (in term of GDP), municipal own resources have almost doubled their share of GDP. The chief explanation of such divergent trajectories lies in the distinction between the tax bases of departments and municipalities. While the departmental tax base—consisting primarily of the consumption of “vice” goods—is inelastic, municipalities enjoy a dynamic and growing tax base, encompassing urban and rural property and urban economic activity.

Mobilizing revenues for the departments requires the introduction of different tax bases and the modification of the current Colombian departmental tax regime. We suggest establishing a value-added tax (VAT) surcharge and/or a retail tax. Mobilizing resources for municipalities requires more efficient exploitation of their existing tax bases. We suggest improving the efficiency of local tax collection by enhancing the administrative capacity of the municipalities and updating the tax bases of local taxes. Thus, the purpose of this research is twofold: to explore the changes that would be required to strengthen the generation of own revenues in departments and municipalities, and to determine the effects on the financing structure, fiscal dependence, and vertical imbalances of the alternatives for generating own revenues.

This paper is divided into five sections. The first is the introduction. The second section describes the fiscal decentralization process and its impact on sub-national finances. The third presents the evolution of departmental public finances, departmental vertical imbalances and the proposal to levy a VAT surcharge and a retail sales tax for the

departments. The fourth section describes the evolution of municipal finances and municipal vertical imbalances. It also includes calculations of the effective rates of the property and land tax and the industry and commerce tax, and estimates the municipal tax burden, the efficiency rate of tax collection, and the determinants of both. The fifth section concludes.

## **2. The Decentralization Process in Colombia and Sub-national Public Finances**

### ***2.1 Evolution of the Decentralization Process***

Fiscal and political decentralization in Colombia began at the end of the 1950s. According to Junguito and Rincón (2009), the 1958 Constitutional Amendment allocated at least 10 percent of the national budget to education expenditures, marking the beginning of a “formal scheme of transfers.” The next steps were the 1968 Constitutional Amendment, which created the *Situado Fiscal* defined as the proportion of Central government revenues to be transferred to the departments to finance education and health; Law 33 of 1968, which initiated the revenue-sharing system and the sales tax cession; and Laws 46 of 1971 and 14 of 1983, aimed at strengthening municipal and departmental taxation.

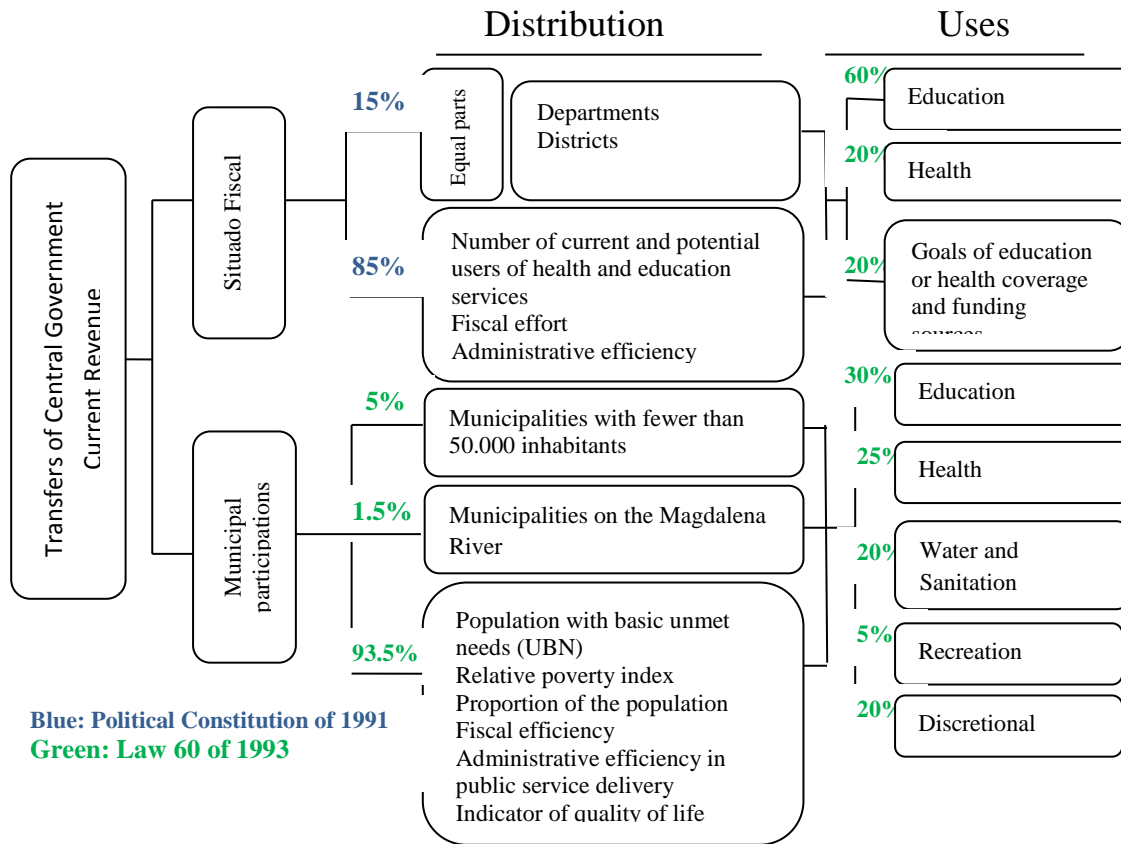
The 1986 Constitutional Amendment of 1986 also established that the provision of public goods by local governments should conform to the needs of the population. Local democracy should assure that the provision of public goods would reflect such needs. The popular election of mayors and the greater political participation of the population through mechanisms such as the Local Administrative Boards (*Juntas Administradoras Locales*, or JAL)<sup>1</sup> would lead to a decentralization process in accordance with the abovementioned principles.

The 1991 Constitution ushered in a new stage of decentralization. Specifically, a set of laws was approved that substantially changed sub-national public management, finances, and politics. A key change was the popular election of governors (Art. 260).

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<sup>1</sup> The JALs were created in 1968, reformed in 1986 and legitimized in the 1991 Constitution. The JALs’ representatives, known as *ediles*, are chosen through open elections.

**Figure 1. Intergovernmental Transfer System, 1993-2001**



Source: Political Constitution of 1991 and Law 60 of 1993.

As for fiscal decentralization, the Constitution introduced a new scheme of transfers with a precise set of formulas, in which central government current revenues (mainly national taxes) were to be shared with the departments through the *Situado Fiscal*, allocated to education and health, and with municipalities through the *Participación Municipal*, aimed at covering spending on education, health, and water and sewerage (see Figure 1).

The new institutional framework also defined the distribution of natural resource royalties among departments and municipalities (Arts. 360 and 361).<sup>2</sup> The 1991 Constitution initiated a process of decentralization concentrated on the local provision of goods and services and on transfers, but it did not touch on generation of SNGs' own resources. During the 1990s, the departments and municipalities financed most of their

<sup>2</sup> Nonetheless, last June, the Royalties Reform was passed, which transformed the way in which they were regionally allocated.



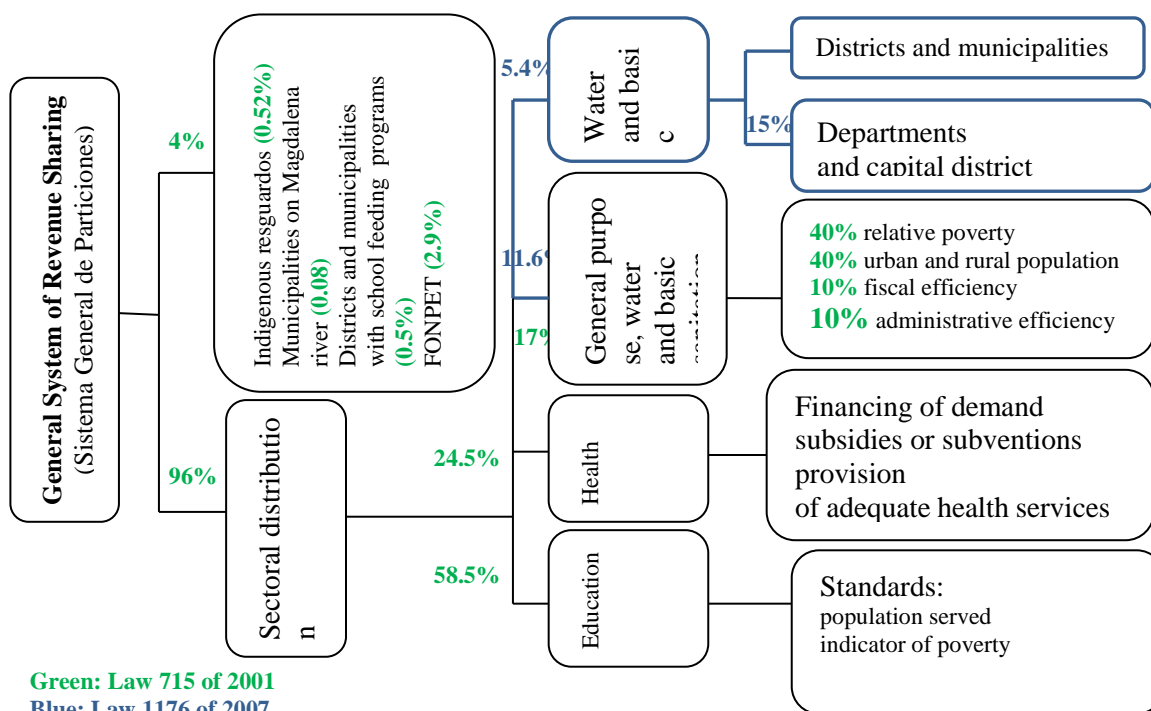
expenditures through transfers from the central government, resulting in significant vertical imbalances and in most cases fiscal deficits<sup>3</sup> that threatened fiscal sustainability and macroeconomic stability (Sánchez and Zenteno, 2010). As a matter of fact, territorial debt rose from 1.1 percent of GDP to 3.5 percent of GDP between 1990 and 1999 (Ministry of Finance, 2009).

To curb the growing indebtedness and fiscal indiscipline of SNGs, two pieces of legislation were approved: Law 358 of 1997, which regulated the indebtedness of the territorial entities, and Law 617 of 2000, which established limits on the growth of operating expenses. In addition, to increase the efficiency of transfers, a reform of the transfer system was undertaken. First, it created a system of revenue sharing (*Sistema General de Participaciones*, or SGP) in which the amount of resources to be transferred was fixed, and it established that these resources would grow at 2 percent annually in real terms. In addition, the formulae to allocate resources between sub-national entities based on Law 60 of 1993 were also changed by Laws 715 of 2001 and 1176 of 2007. Law 715 determined that the distribution of the transfer would be based on the coverage and growth of the health and education services provided by the territorial entities, not on population and poverty rates, criteria that had been established in Law 60 of 1993 (see Figure 2).

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<sup>3</sup> According to Rodden (2002), large and persistent deficits occur when sub-national governments depend strongly on intergovernmental transfers and have, at the same time, free access to credit, generating fiscal indiscipline.

**Figure 2. Intergovernmental Transfer System, 2001 to present**



Source: Law 715 of 2001 and Law 1176 of 2007.

With respect to own resource generation, Congress approved Law 488 of 1998, which increased the base for some sub-national taxes, such as the registration tax, and Law 1111 of 2006, which raised the cigarette tax. In order to augment health revenues, decree 127 of 2010 increased the rates of the departmental cigarette and liquor taxes, as well as the VAT for beer and gambling. Furthermore, the gasoline surcharge was unified, and a surcharge on diesel (ACPM) was levied. At the municipal level, the central government encouraged the compilation of municipal tax rules and improvement in the efficiency of tax collection and better control of tax evasion (Ministry of Finance, 2009). Nevertheless, in general, both the bases and rates of municipal taxes have remained unchanged in the last two decades.

## ***2.2 Trends in Central National, Regional, and Local Government Finances***

Trends in departmental and municipal finances—particularly spending—have been closely tied to the decentralization process. In fact, although with some fluctuation, departmental and municipal spending have increased over the years in accordance with their responsibilities for providing public goods—which are largely financed with transfers from the central government. The SNGs' own revenues have shown different trends during the last two decades, with those of the municipalities being much more dynamic. Table 1 shows own revenues for the three levels of government. Clearly, central government revenues are much higher than the sub-national revenues, although the share of the latter in total revenue at all levels of government rose from 17.4 percent to 19.5 percent from 1994 to 2009, mostly as a result of the increase in local government own revenues from 1.4 percent to 2.5 percent of GDP (see Table 1).

As can be seen in Table 1, total spending by all levels of governments rose from 14.3 percent in 1994 to 21.8 percent of GDP in 2009—around 7.5 percent of GDP—while sub-national government spending increased from 6.2 percent to 12.4 percent of GDP—more than 6 percent of GDP. These figures indicate that most of the increase of the size of government during the last 15 years has come from more SNG spending. Nonetheless, own SNG revenues grew only from 2.5 percent to 3.7 percent of GDP—1.2 percentage points of GDP. This implies that only 20 percent of the change in SNGs spending as a percent of GDP has been financed through greater fiscal effort on the part of SNGs themselves.

**Table 1. Central Government, Departmental, and Municipal Structure of Revenues and Expenditures, 1994-2009 (%GDP)**

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Central Government Own Revenues	9.8	9.6	9.9	10.3	9.8	10.4	10.8	12.1	12.3	12.6	12.9	13.5	14.7	15.0	15.6	15.2
Central Government Tax Revenues	8.6	8.24	8.48	8.98	8.79	8.88	9.42	11	11	11.5	11.9	12.4	13.4	13.4	13.4	12.8
Central Government Expenditure	11	11.5	13.2	13.5	14.1	16.2	16.2	18.3	17.5	17.3	16.9	17.8	17.9	18	17.6	19
Transfers	5.7	6.2	7.2	7.3	8	9.7	7.7	10.7	8.6	8.6	9.4	10.4	9.8	9.5	9.7	11
Transfer to Sub-national governments	3.3	3.6	4.8	5.3	5.7	7.3	6.9	7	8.2	7.2	7.2	7.3	7	6.3	7.2	7.8
Departments	1.9	1.9	2.7	3.1	3.5	4.2	3.6	4.3	4.7	3.9	4	3.8	3.5	3.1	3.5	3.8
Municipalities	1.4	1.6	2.1	2.2	2.2	3.1	3.2	2.8	3.4	3.4	3.2	3.5	3.5	3.2	3.7	4.0
Total Departmental Revenue	3.1	3.2	4	4.4	4.8	5.6	5.1	5.7	6.1	5.4	5.5	5.5	5	4.6	5	5.4
Departmental Own Revenues	1	1	1.1	1.1	1.1	1.1	1.1	1	1	1.1	1.2	1.2	1.1	1.1	1	1.2
Departmental Tax Revenues	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1	0.9	0.9	0.9	0.9
Royalties	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.5
Transfers from Central Government	1.9	1.9	2.7	3.1	3.5	4.2	3.6	4.3	4.7	3.9	4	3.8	3.5	3.1	3.5	3.8
Departmental Expenditures	3.2	3	3.8	4.7	4.7	5.6	4.9	5.2	5.9	5.1	5	5.3	5.1	5	5	5.6
Total Municipal Revenue	2.8	3.2	3.2	3.5	3.6	4	4.3	4.1	4.8	5.5	5.6	5.6	5.6	5.3	5.7	6.1
Own Revenues Municipalities	1.4	1.6	1.8	1.8	1.9	2	1.8	1.8	2	2.2	2.3	2.4	2.5	2.3	2.3	2.5
Municipal Tax Revenues	1.1	1.2	1.2	1.3	1.5	1.6	1.5	1.5	1.6	1.7	1.8	1.8	1.9	1.9	1.9	2.1
Royalties	0	0	0.14	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.4	0.3
Transfers from the Central Government	1.4	1.6	1.2	1.5	1.6	1.9	2.3	2.1	2.6	3	3	3	2.8	2.7	3	3.3
Municipal Expenditures	3	4.1	4.4	4.7	5	5.9	5.6	5	5.7	5.9	5.5	5.9	6.3	6.4	5.8	6.8
Total Revenues (net of transfers)	14.1	14.1	15	15.7	15.1	15.9	14.2	18	15.9	16.5	17.1	17.8	19	19.1	19.8	19.6
Own Revenue of sub National Governments	2.5	2.6	2.9	3	3	3.1	2.8	2.9	3	3.3	3.5	3.7	3.6	3.4	3.3	3.7
Total Expenditure (net of transfers)	14.3	16.1	17.9	18.7	19.7	22.1	18.6	24.1	19.7	19.7	19.2	20.2	20.7	21.2	19.7	21.8
Spending of Sub national Governments	6.2	7.1	8.2	9.4	9.6	11.5	10.5	10.2	11.6	11	10.4	11.2	11.4	11.4	10.8	12.4

Source: Banco de la Republica, DNP, DANE.

The fiscal trends of SNGs show increasing financial dependence on the central government for the provision of the public goods under their responsibility. Such larger dependency may distort compliance with the main objectives of the decentralization process: responsiveness of SNG authorities to the needs of the population and efficiency in the provision of public goods (Barham and Mookherjee, 2006; Faguet, 2006, Faguet and Sánchez, 2008, Weingast, 2009). To comply with these objectives, the decision to provide local or regional public goods should take into consideration the marginal costs and marginal benefits of these goods to the population. Such decisions are made through a political process and should assure that citizens are able to communicate their preferences to elected officials, who would be accountable to the electorate for their performance. Since 1991, Colombia has undertaken a deepening of its sub-national democracy that, despite numerous problems, has generated a political process capable of responding to citizens' demands. Nonetheless, the fact that a large number of SNGs lack fiscal capacity and have increased their fiscal dependency may hinder the very objectives of decentralization. As Weingast (2009) points out: "...elections in the presence of fiscal dependence and opportunism become a means of political control rather than of citizen expression. Local government fiscal independence mitigates this perverse effect."

### **3 Revenue Mobilization in Colombian Departments**

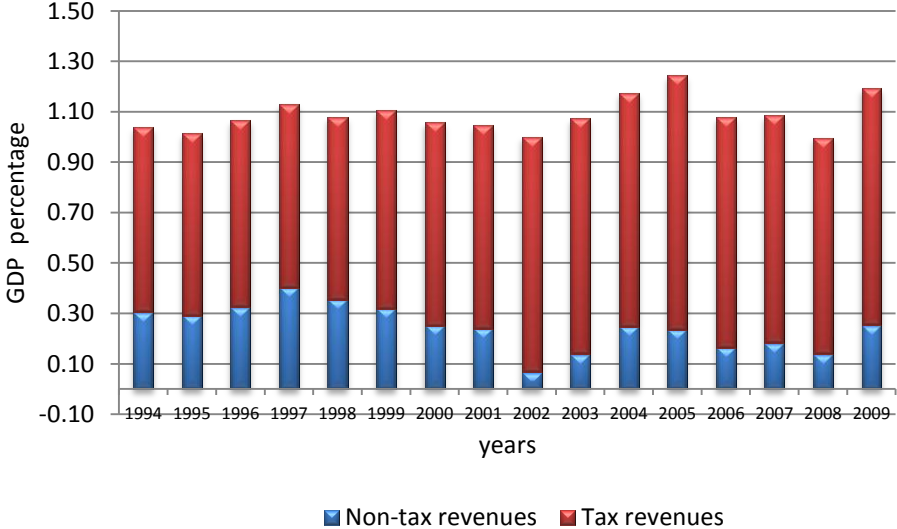
#### ***3.1 Structure and Evolution of Departmental Finances***

According to the 1991 Constitution, Colombia has 32 departments, which have been granted the rights to govern under their own authority, exercise powers, manage resources and local taxes, and share in national revenues. The departmental functions should be complementary to those of the municipalities, and should include serving as intermediaries between the municipalities and the central government. Departments have three sources of revenue: their own resources, capital income, and matching grants.

Own departmental resources—tax and non-tax revenues—from 1994 to 2009 are shown in Figure 3. Own resources have remained broadly stable at around 1.1 percent of GDP, albeit with a growing share of taxes. The departments have more than 10 types of taxes, yet 62 percent of revenue originated from taxes on four categories of products: beer, liquor, tobacco and cigarettes, and vehicle registration. Departmental tax revenue in 2009 was nearly 1 percent of

GDP—up from 0.8 percent during the 1990s. Of the top five taxes, those on beer and liquor have the largest shares (see Table 2).

**Figure 3. Own Departmental Revenues, 1994-2009**



Source: Authors’ calculations based on DNP data.

The low income elasticity of departmental taxes, in addition to the few incentives for generating of own revenues, implies that today the main source of departmental financing are the central government transfers. The other resources are royalties, other sources, and matching grants. In 1994, transfers to departments represented 1.7 percent, and in 2009 1.8 percent, of GDP. The highest percentage was achieved in 2002, when they reached 2.3 percent of GDP. After that year, transfers to departments as a percent of GDP declined, because annual growth of shared revenues was set at 2 percent in real terms, and because the part of the transfers that in the previous framework (Law 60 of 1993) had gone to the departments now went directly to the municipalities (Law 715 of 2001).

Law 60 of 1993 determined that 60 percent of departmental transfers should be spent on education, 20 percent on health, and the remaining 20 percent distributed between the two sectors depending upon coverage objectives. When the system changed in 2001, it was established that 96 percent of transferred revenues under the General System of Revenue Sharing (SGP) should be spent as follows: 58.5 percent on education, 24.5 percent on health, 11.6 percent

on general purposes, and 5.4 percent on water and sewerage.<sup>4</sup> Revenues shared with departments and municipalities would be distributed according to coverage expansion and service provision. However, as shown in Table 2, the change in legislation did not encourage own resource generation in the departments. Other resources are royalties which have fluctuated between 0.2 percent and 0.45 percent of GDP, and are concentrated in the mineral- and oil-producing departments of Arauca, Casanare, Cesar, and Meta. In 2011, the Colombian Congress undertook a reform of the Constitution, establishing that royalties would be distributed across all SNGs. The objective of this reform was to achieve regional equity in the allocation of the royalties and to reduce the incentives for corruption brought about the concentration of those large resources in just a few entities. Nonetheless, the reform could have the effect of increasing vertical imbalance among SNGs, as it may reduce their incentives to mobilize own revenues.

In the last 15 years, departmental spending has steadily increased, as is well documented in the Colombian literature on decentralization (Sánchez and Zenteno, 2010; Zapata, 2010; Ministerio de Hacienda y Crédito Público, 2009, Federación Nacional de Departamentos, 2009; Meisel and Barón, 2003, Iregui et al., 2001; etc.). This trend is linked to departmental responsibilities in the provision of public goods and services, particularly education and health (named investment in Table 2, line 1). Nevertheless, most public goods and services have been financed with transfers from the central government, with scant participation of new departmental own resources. The spending trend financed with transfers has been reflected in a widening vertical imbalance that will be analyzed in the next section.

Another source of departmental financing is debt. Table 2, line 9 indicates that departmental debt as a percentage of both GDP and own revenues rose substantially during the 1990s, but declined in the 2000s, following the enactment of legislation (Laws 617 of 2000 and 795 of 2003) to regulate SNG borrowing.<sup>5</sup>

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<sup>4</sup> The allocations to water and sewerage and general purposes were determined by the Law 1176 of 2007.

<sup>5</sup> The indebtedness process of the 1990s is not irrational under a decentralization framework where the principal sources of financing are transfers (Rodden, 2002). If the spending and generation of own revenues in the territorial entities had been defined in the Political Constitution of 1991 with higher levels of autonomy, local governments would have increased the possibility of financing through own revenues while the debt would be perceived as a local responsibility, reducing the likelihood of excessive resort to indebtedness (Rodden, 2002).

**Table 2. Revenues, Expenditures, and Vertical Imbalances of Departments (% of GDP)**

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1 Expenditure Function	3.2	3.0	3.8	4.7	4.7	5.6	4.9	5.2	5.9	5.1	5.0	5.3	5.1	5.0	5.0	5.6
1,1 Operating expenditure	0.6	0.7	0.8	0.8	0.8	0.9	0.7	0.6	0.7	0.8	0.7	0.6	0.5	0.6	0.6	0.6
1,2 Investment expenditure	2.5	2.3	3.1	3.9	3.8	4.7	4.2	4.6	5.2	4.4	4.3	4.7	4.6	4.4	4.4	4.9
1.2.1 Education	1.3	1.2	1.3	1.2	1.2	1.6	1.3	1.6	2.0	1.5	1.5	1.4	1.3	1.0	1.4	1.6
1.2.2 Health	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.7	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3
1.2.3 Other social investment	0.4	0.3	0.8	1.4	1.8	2.2	2.1	2.2	2.3	1.7	2.1	2.3	1.8	1.6	1.6	2.0
1.2.4 Capital investment	0.4	0.4	0.5	0.7	0.3	0.3	0.3	0.2	0.5	0.8	0.4	0.7	1.2	1.5	1.2	1.1
2 Own Revenues	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.2	1.2	1.1	1.1	1.0	1.2
2,1 Ingresos Tributarios	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9
2.1.1 Beer	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2.1.2 Liquor	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2.1.3 Tobacco and Cigarettes	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2.1.4 Registration and Annotation	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2.1.5 Vehicle registration	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2.1.6 Other	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2,2 Non-tax revenue	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3
3 Vertical imbalance (2-1)	-2.2	-2.0	-2.8	-3.6	-3.6	-4.5	-3.8	-4.2	-4.9	-4.1	-3.8	-4.0	-4.0	-3.9	-4.0	-4.4
4 Vertical imbalance financing	2.1	2.2	3.0	3.3	3.7	4.5	4.0	4.6	5.1	4.3	4.3	4.2	3.9	3.5	4.0	4.2
4.1 Transfers	1.7	1.6	1.8	1.8	1.8	2.2	1.8	2.2	2.3	1.9	1.8	1.7	1.6	1.3	1.6	1.8
4.2 Other transfers	0.2	0.3	0.8	1.2	1.5	1.8	1.6	1.8	2.2	1.8	2.0	1.9	1.8	1.7	1.7	1.8
4.3 Royalties	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.5
4.4 Cofinancing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
4.5 Others	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2
5 Other expenditure	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
5.1 Debt interest	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
6 Total revenues (2+4)	3.1	3.2	4.0	4.4	4.8	5.6	5.1	5.7	6.1	5.4	5.5	5.5	5.0	4.6	5.0	5.4
7 Total expenditure (1+5)	3.3	3.1	4.0	4.9	4.9	5.8	5.1	5.4	6.0	5.2	5.0	5.3	5.2	5.0	5.1	5.6
8 Fiscal Balance (6-7)	-0.2	0.1	0.1	-0.5	-0.2	-0.2	0.0	0.3	0.1	0.1	0.5	0.2	-0.2	-0.5	0.0	-0.2
9 Public Debt	0.7	0.7	0.9	1.1	1.1	1.3	1.5	1.3	1.1	0.9	0.7	0.6	0.4	0.5	0.4	0.4
10 Debt/Own revenues	0.7	68.7	86.4	101.5	106.3	116.7	139.7	123.3	113.6	85.0	57.8	46.7	41.1	43.4	39.7	36.8

Source: Authors' calculations based on DNP data.



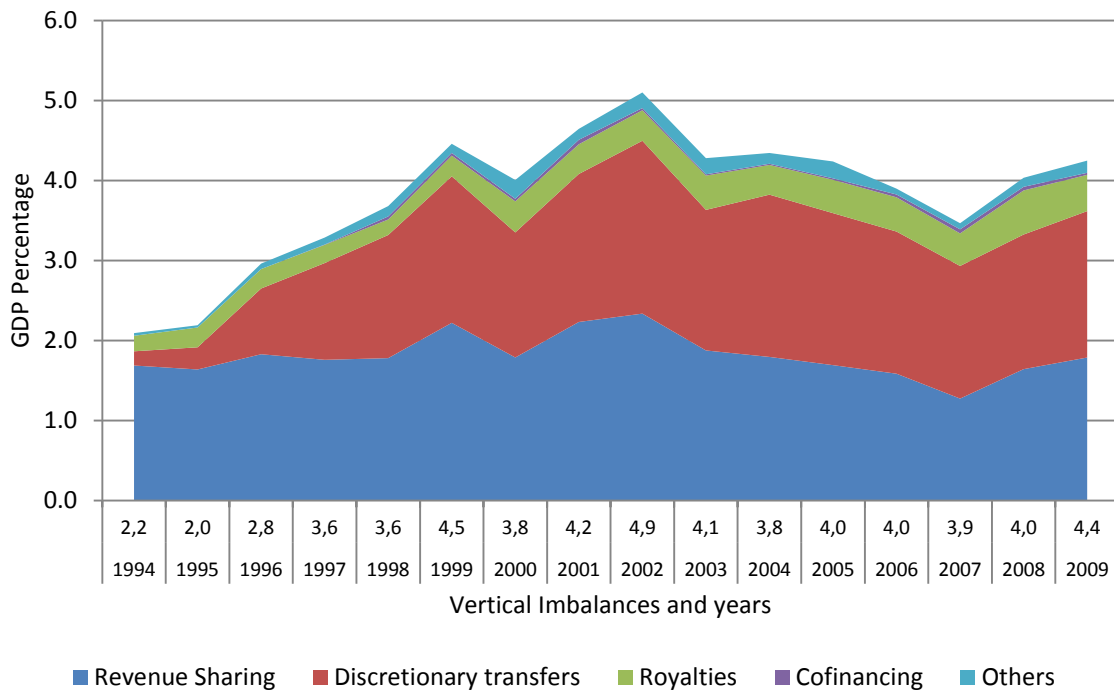
### *3.1.1 Vertical Imbalance of Departments, 1994-2009*

In the last 15 years, the vertical imbalance of departments has steadily widened (Table 2). Although the fiscal situation of departments regarding indebtedness and budget deficits has improved in the last ten years, fiscal dependence and hence vertical imbalances have gotten worse. The reason for this trend is the inflexibility of the Colombian institutional framework in relation to own revenue generation by the departments. As a result, the growth of departmental expenditures as a percentage of GDP (from 3.4 percent of GDP in 1994 to 5.6 percent in 2009) was only marginally financed by higher departmental own revenues.

The spending increase reflected the decentralization spending responsibilities of the departments mandated by the Law and the Constitution, rather than the departments' autonomous decisions (Iregui et al., 2003). In contrast, own revenues have remained almost unchanged in the last 15 years, rising only from 0.7 percent in 1994 to 0.9 percent of GDP in 2009. Thus, while departmental spending rose by 2.2 percent of GDP between 2000 and 2009, own revenue only did so by 0.2 percent of GDP. This weak performance of departmental own resources is due to the fact that their tax base mostly consists of consumption of vices, which exhibits low income elasticity.

Between 1994 and 2009, the vertical imbalance of the departments rose from 2.2 percent of GDP to 4.4 percent, reaching its peak in 2002 at 4.9 percent of GDP. The Colombian decentralization process does not encourage either fiscal autonomy or revenue mobilization by the departments to reduce vertical imbalances (Iregui et al., 2003). Figure 4 (from Table 2) shows how the departmental vertical imbalance has been financed from 1994 to 2009. The figure indicates that both compulsory and discretionary transfers from the central government have financed most departmental spending.

**Figure 4. Vertical Imbalance and Sources of Financing (% of GDP)**



Source: Authors' calculations based on DNP data.

### 3.1.2 Vertical Imbalances by Department

This section analyzes the behavior of the vertical imbalances of each of the 32 Colombian departments from 2000 to 2009. The departments with the lowest vertical imbalance as a percentage of their GDP have been Valle (-1.3 percent), Atlántico (-2.3 percent), Santander (-3.3 percent), Risaralda (-3.1 percent), and Antioquia (-3.1 percent), while the new departments—Guainía (-78.9), Vaupés (-62 percent), Guaviare (-33 percent) and Vichada (30 percent)—showed the highest vertical imbalances. According to Figure 4, the vertical imbalance of these departments ranges between 30 percent and 78.9 percent of their GDP.

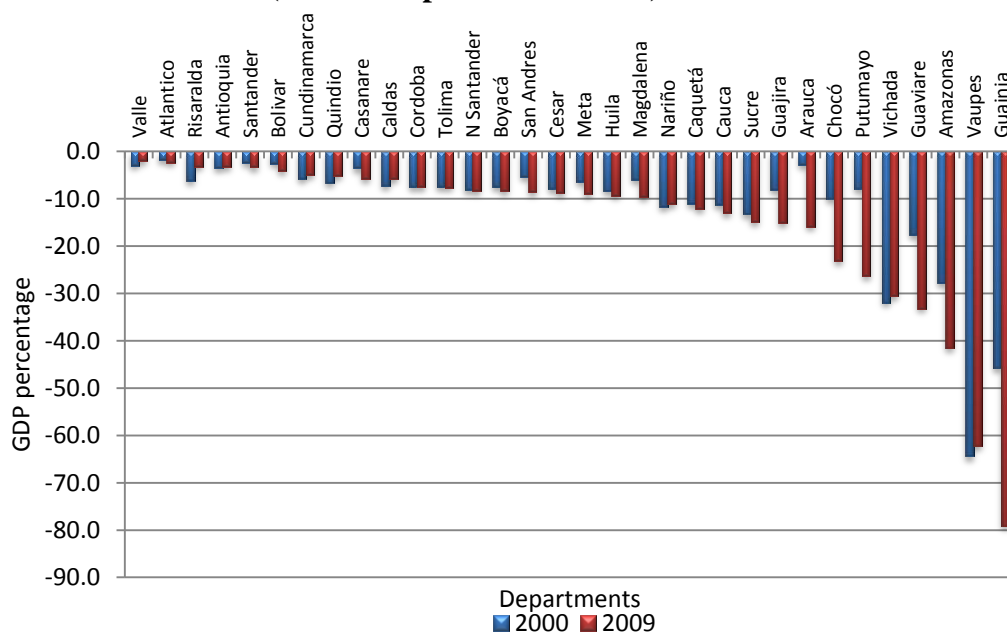
The departments with lowest vertical imbalances are the most economically active. For example, the departments of Antioquia and Valle generated 25 percent of total Colombian GDP in 2009 and have the most dynamic economic activity, including manufacturing and services, which may facilitate better tax revenue collection compared to departments with less economic activity.

Nevertheless, current own tax revenue as a percentage of GDP is not necessarily higher in the wealthier departments. For instance, Antioquia's own revenues climbed from 1.5 percent in

1994 to 2.1 percent in 2009. Atlántico's has fluctuated around 1.4 percent of GDP, while Risaralda and Valle's have averaged around 1.6 percent and 1.1 percent, respectively. In contrast, in Vaupes, Guainía and Guaviare—poorer departments—current taxes amount to more than 3 percent of departmental GDP yet they exhibit the highest vertical imbalance, which has widened even further in the last decade. It seems, then, that vice consumption—the base of departmental taxes—comprises a greater proportion of GDP in poorer regions.

Consequently, in the poor regions, the large vertical imbalance as a percentage of GDP depends almost entirely on central government transfers that the departments receive as a proportion of their own GDP and has very little to do with the region's relative fiscal burden. In contrast, in the wealthy regions, the small vertical imbalance as a percentage of GDP is very much related to the region's fiscal burden. Thus, given the differences in the fiscal structures across SNGs, additional fiscal effort would have different effects on incentives and outcomes in poor and in rich departments.

**Figure 5. Vertical Imbalance of Departments, 2000 and 2009  
(as % of departmental GDP)**



Source: DNP. Authors' calculation.

### ***3.2 Proposals for Revenue Mobilization in the Departments***

Colombian departments levy on average 19 kinds of taxes,<sup>6</sup> all of them decreed and regulated by national laws. They have the autonomy to decide which taxes to collect,<sup>7</sup> how they are collected, and their final allocation (Ojeda, 2006). However, as explained above, the increase in departmental own revenues has been very small.

In general, all central government measures aimed at strengthening the decentralization process have been focused on controlling spending and borrowing (Law 617 2000, Law 715 2001, and Law 1176 2007) and on defining responsibilities for the delivery of public goods (Political Constitution, Decree 1222 1986, Law 60 1993, Law 715 2001, and Law 1176 2007). Little has been done to encourage own revenue generation. The worst revenue situation has been experienced by the departments that in the last 14 years have had a feeble revenue increase (only 0.2 percentage points of GDP), in contrast with municipalities whose own revenues jumped from 1.1 percent of GDP in 1994 to 2.1 percent of GDP in 2009, as shown in Table 1.

A number of authors have noted that this behavior in departmental own revenues can be explained by the fact that departmental taxes are less dynamic than municipals taxes, more difficult to monitor, complex, inflexible, and because of their characteristics more exposed to economic cycles (Zapata, 2010; Federación Nacional de Departamentos, 2009; Gobernación de Antioquia, 2009; and Ramirez et al., 2007). In addition, departmental taxes have low income elasticity (Junguito and Rincón, 2009), depend on vice consumption, and are highly concentrated on tobacco and cigarettes, liquor, and beer, which have high tax rates which encourage smuggling, and consequently have a low tax base (Gobernación de Antioquia, 2007). Thus, to provide decentralized health, education, drinking water and sewerage services efficiently, to deliver regional public goods to foster regional development such as roads, irrigation, environmental protection among others, and to reduce the rising vertical imbalances, the mobilization of new sources of own revenues for the departments is a policy priority.

There have been proposals to mobilize new departmental revenues, but the majority of them have stressed increasing existing departmental taxes (Zapata, 2010) or modifying some aspects of their administration, such as the creation of a departmental tax code (Federación Nacional de Departamentos, 2009). Other proposals advocate the creation of a compensatory

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<sup>6</sup> Direct taxes, indirect taxes, rates, fines and others non-tax revenues.

<sup>7</sup> Through *Asambleas Departamentales*.

system of transfers aimed at eliminating regional inequalities, which would, in fact, translate into greater vertical imbalances.

The main problems of Colombian departmental taxes are associated with the characteristics of the taxed goods. Improving efficiency in tax collection is a desirable goal, yet it is not sufficient to increase own revenues in a way that substantially reduces vertical imbalances. Indeed, despite the increase in beer and wine consumption and even in some tax rates in recent years, departmental own revenues have not risen above 1 percent of GDP.

Numerous options for increasing local revenues in decentralized governments have been suggested in the international literature (Haughwout et al., 2003; Berg et al., 2002; Bardhan and Mookherjee, 2000; Cremer et al., 1996; Feenber et al., 1997; Kotikloff, 1993; and Okun, 1971). For departmental revenue mobilization, this paper considers new instruments to increase own revenues. These mechanisms attempt to avoid the problems associated with the lack of dynamism and control, convolution, and inflexibility that characterize current departmental taxes. With a view to achieving a departmental tax system that exploits revenue potential based on the principles of social and political consensus, adequacy, correspondence, efficiency, and transparency, the following new sources of own revenue are analyzed: a retail sales tax and a VAT surcharge. As in the case of municipal taxes, departments should have the autonomy to set the VAT surcharge and the retail tax rate in their respective Assemblies, within a range established by a national law. It is precisely the fact that the departments would determine the VAT surcharge and the retail tax rate within a political process which makes those revenues “own revenues.” The surcharge in particular should not be regarded as an “additional revenue sharing,” but rather as a regional tax that has the same tax base as the national VAT. Moreover, the allocation of the new funds would be decided through the political process and public consultation within each region.

VAT and retail surcharges have a large revenue collection potential, since they have a dynamic tax base associated with manufacturing and services. Another characteristic of the VAT and retail taxes is that they are administratively less costly. In fact, no new administrative structure must be created to manage the creation of a surcharge; the National Tax and Customs Office (DIAN), through its regional offices, could help departmental authorities facilitate

collection and distribution.<sup>8</sup> Thus, the DIAN should be in charge of collecting the new taxes, as it has the administrative and logistical capacity to do so, yet the departmental governments should bear the political cost of determining the amount of the VAT surcharge or the retail tax rate.

Feenber et al. (1997) and Kotikloff (1993) have examined the social and economic effects of a retail tax. They found that levying a retail tax could increase revenues efficiently and with a low loss of social welfare.<sup>9</sup> For Kotikloff (1993), levying and strengthening this tax not only increases government revenues but also encourages social savings. Cremer et al. (1996) found that a VAT surcharge may have positive redistributive impacts. An important drawback of the VAT surcharge is that the most industrialized and service-oriented regions would have the largest revenue collection, which could exacerbate existing regional differences in economic and social development.

### *3.2.1 Expected VAT Surcharge and Retail Sales Tax Revenues by Department*

Various sources of information were used to calculate expected revenues from the retail tax and VAT surcharge. For the VAT, information was taken from the DIAN on tax collection by type of tax—VAT and income and wealth taxes—from the 49 regional DIAN branches. This information allows collection of the VAT in each of the 32 Colombian departments.<sup>10</sup> Since a fraction of the VAT is withheld and the amount withheld is reported in the DIAN's regional database together with the income tax withholding, it was necessary to calculate the departmental VAT withholding from the DIAN's national statistics that reports both VAT and income tax withholding separately.<sup>11</sup>

Therefore, to calculate the VAT collected in each department  $i$  at time  $t$ , the following equation was used:

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<sup>8</sup> Income tax may well be a new source of revenue. Nevertheless, there are several problems associated with it: i) there are few individuals that pay income tax; and ii) it is difficult to clearly define the geographic area of a business taxpayer when the business or corporation has branches all over the country.

<sup>9</sup> Most developed countries have a SN sales tax. In the U.S. states of Georgia, Alabama, and Hawaii, this tax is around 4 percent. In California it reaches 0.5 percent. According to the US Census Bureau, the sales tax generated more than US\$150 billion in revenues in 2007.

<sup>10</sup> As an illustration the sectionals of Medellín, Turbo, and Urabá were aggregated as the Antioquia sectional since they are in the same department.

<sup>11</sup> The calculations must ensure that the calculated (imputed) VAT withholding at departmental level is equal to national withholding.

$$VAT\ Total_{it} = VAT(i) + \frac{Retenciones(it)}{\sum Retenciones(it)} Retención\ Fuente\ VAT(it)$$

where  $VAT\ Total_{it}$  is the annual collection of department  $i$  during year  $t$ .

To calculate the retail sales base by department, the DANE's Annual Commerce Survey (ACS) that reports on retail sales was utilized. A limitation of the ACS is that it is not disaggregated by department. We assume that the share of retail sales in GDP for each department mirrors the country's share. Thus, total retail sales in each department were obtained using the following equation:

$$Retail\ Sales_{it} = National\ Sales\ Total \times \frac{GDP_{it}}{GDP_{National}}$$

where  $Retail\ Sales_{it}$  are the retail sales in department  $i$  during year  $t$ .

### 3.2.2 VAT Surcharge, Retail Sales Tax, and Departmental Tax Revenues

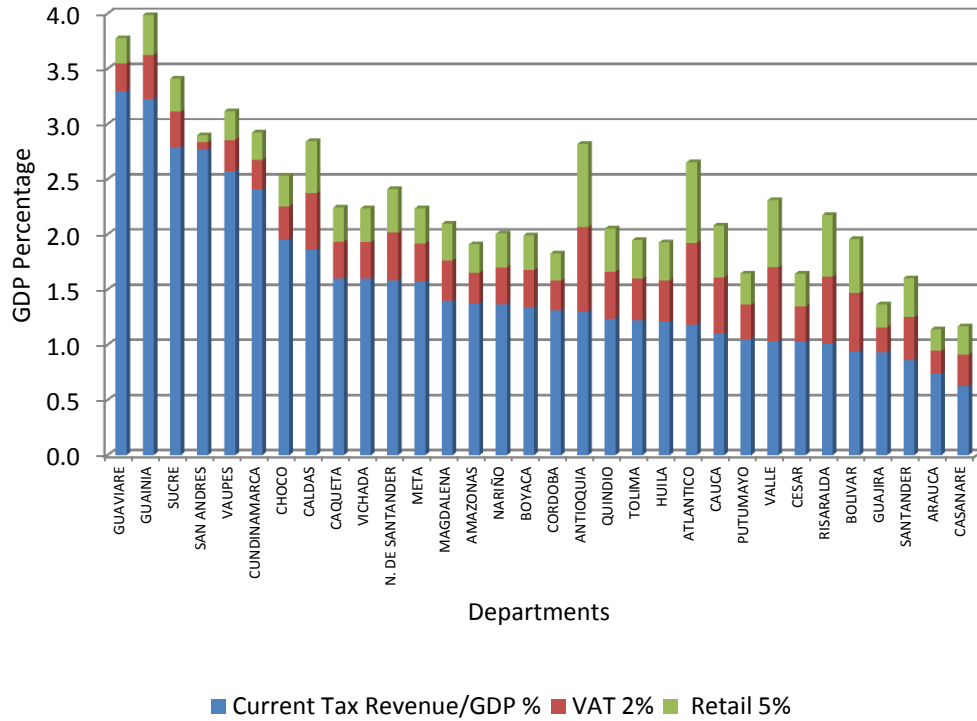
In order to calculate the expected revenue from a VAT surcharge, that surcharge was applied to the VAT revenues of each department in the following steps: i) computation of the ratio  $\frac{VAT_{it}}{GDP_{it}}$  (0.16) in order to determine the proportion of each departmental GDP taxed with the VAT; and ii) estimation of the expected revenue VAT surcharge applying a surcharge rate of 2 percent:

$$VAT\ surcharge\ (revenues)_{it} = GDP_{it} \times \left[ \frac{VAT_{it}}{GDP_{it}} \right]_{0.16} * VAT\ Surcharge$$

For the retail sales tax, scenarios with 2 percent and 5 percent rate were simulated assuming a compliance ratio similar to the VAT compliance ratio, that is, that the retail sales that would be taxed with the retail sales tax in each department would be similar to the proportion of GDP represented by the VAT in each department.

Figure 6 depicts the change in departmental tax revenues if a VAT surcharge of 2 percent and a retail sales tax of 5 percent were implemented. It shows that the departments with economic activities concentrated in industry and services more elastic to VAT (e.g., Valle, Atlántico, Risaralda and Antioquia) would record the largest increases in the new sources of revenues.

**Figure 6. Impact of a VAT Surcharge on Departmental Tax Revenues (% of departmental GDP)**



Source: DNP, DANE, DIAN. Authors' calculations.

As mentioned above, the VAT surcharge and the retail sales tax would represent a significant source of revenue for all departments (with the exception of San Andres). The fact that the revenue would depend on industry and service sectors in each department implies that the new revenues would be quite dynamic, as long as these sectors enhance their share in the regional economy. Additionally, departmental authorities would have the incentive to fight evasion of those taxes in their regions.

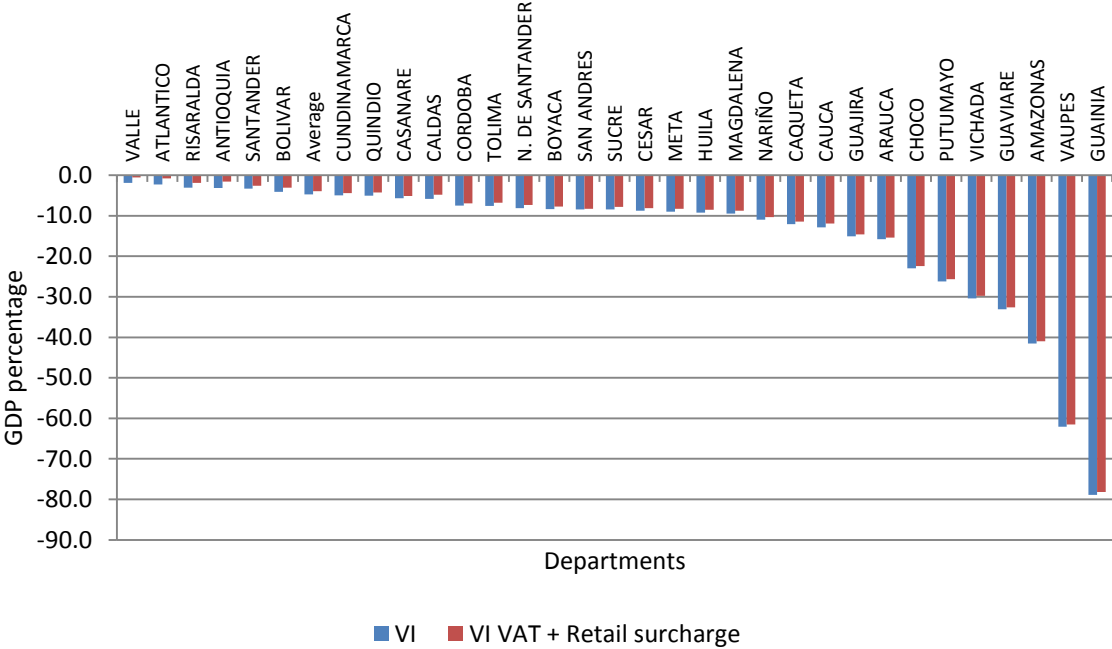
### 3.2.3 VAT Surcharge and Retail Sale Tax and their Impact on Vertical Imbalances

Figure 7 presents the vertical imbalance after applying the 2 percent VAT surcharge and the 5 percent retail sales tax. Since all departments' revenues would increase, the overall vertical imbalance would drop. Nevertheless, with a 2 percent VAT surcharge, the vertical imbalance reduction would be significantly reduced only for relatively richer departments (e.g., Valle, -69 percent; Atlantico, -64 percent; Bolivar, -24 percent; Risaralda, -37 percent; Antioquia, -48



percent; and Santander, -22 percent). In the remaining departments, the drop in vertical imbalances would be relatively small, under 10 percent.

**Figure 7. Impact of a 5 Percent Retail Sale + 2 Percent VAT surcharge Tax on the Vertical Imbalance of Departments (% of GDP)**



Source: Authors’ calculations based on DNP, DANE and DIAN data.

In the poorest and most rural departments (Choco, Guaviare, Vaupes, Amazonas) the reduction in vertical imbalances would be quite small and in some cases lower than 1 percent. As a whole, the departmental vertical imbalance would drop 15 percent, equivalent to 0.8 percent of GDP. Thus, if the current departmental taxes represent around 1 percent of GDP, implementation of a VAT surcharge of 2 percent and of a retail tax of 5 percent would mean an 80 percent increase in the current departmental taxes. Clearly, levying these new taxes would greatly reduce the departmental fiscal dependence, particularly in the richest and most populous regions, and would allow more regional public goods to be provided.

### 3.3 What Explains Departmental Tax Performance?

Table 3 presents the results of a cross-section OLS econometric model for 2009 to explain the variance of departmental tax revenues as a proportion of GDP for both the current departmental taxes and our estimations of the VAT by department. The model includes as explanatory variables the structure of economic activity, including the share of agriculture, manufacturing, and services in GDP; the proportion of urban population in each department; and per capita GDP.

**Table 3. Results of Cross-Section OLS Econometric Model for 2009**

Variables	VAT/GDP	Departmental Taxation/GDP
Manufacture GDP (percentage)	0.0680*** [3.069]	0.00196 [0.164]
Service GDP (percentage)	0.0324*** [2.897]	0.0153* [1.828]
Urban population (percentage)	-0.00176 [-0.132]	-0.00190 [-0.215]
Per capita GDP	0.00969** [2.416]	-0.00259 [-0.827]
<i>San Andres</i> Dummy		0.228*** [31.23]
Constant	-0.0134 [-1.236]	0.0100 [1.330]
Observations	33	32
R-squared	0.513	0.989
F	7.365	472.2

t-statistics in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Authors' calculation.

Column 1 presents the estimated coefficients for the departmental VAT collection (as a proportion of GDP). The results indicate that industry and services, as well as GDP per capita, impact VAT collection positively and significantly. The results also imply that VAT tax

collection should rise as a result of structural change—more industry and services in GDP—and economic growth. In this regard, the proposed surcharge does not exhibit the low elasticity of the current departmental taxes. The same conclusion may be drawn for the expected revenues from the retail sale tax.

The estimated coefficients in column 2 indicate that the current departmental taxes as a proportion of GDP are weakly related to the structure of economic activity in the departments (leaving agriculture out of the regression). Only the share of services in GDP affects collection of the current departmental taxes. The coefficient for services indicates that an increase of 0.1 in the services' share of GDP would raise the collection of vice taxes by 0.0015 (0.15 percentage points). Neither per capita GDP nor the urbanization rate would influence tax collection.

## **4 Revenue Mobilization for the Municipalities**

### ***4.1 Structure and Evolution of Municipal Finances***

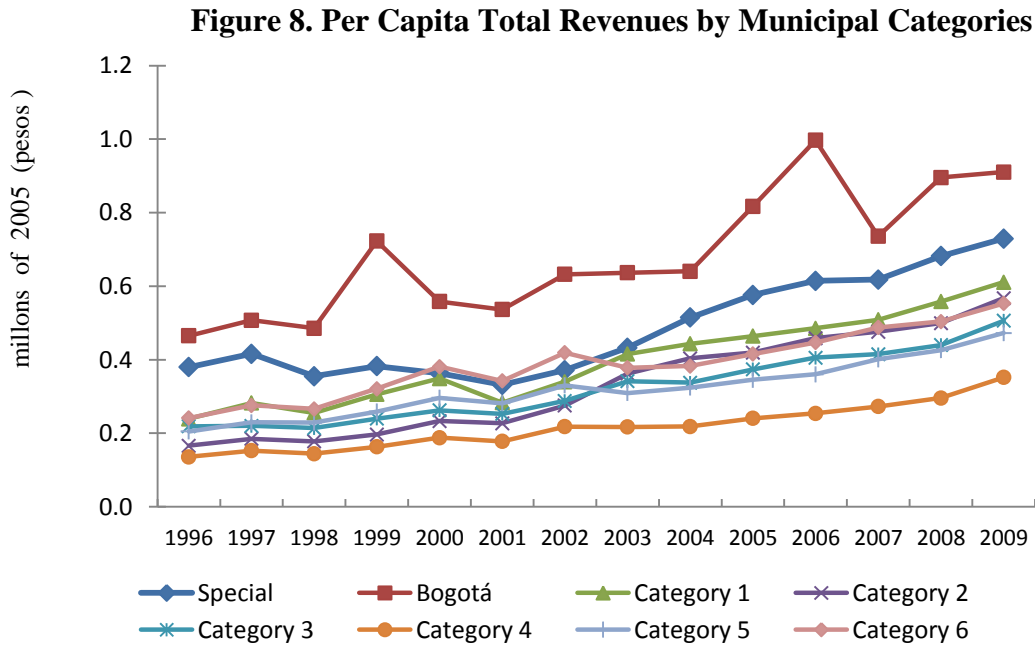
Colombia has 1,098 municipalities and four special districts.<sup>12</sup> The executive is represented by the mayors who are elected by popular vote for four-year terms without the possibility of immediate reelection. The most important progress in the decentralization process occurred in 1986, when a constitutional reform established that mayors would be elected by popular vote. The first mayoral election was held in 1988. The greater political autonomy of municipalities was accompanied by increased municipal responsibilities in the provision of public goods such health services, water and sewerage, and the construction of infrastructure for primary and secondary education. To provide these public goods, the municipalities would receive transfers from the central government and would be able to levy local taxes.

According to Table 4, municipal spending increased from 3.0 percent to 6.8 percent of GDP between 1994 and 2009, while municipal own revenues rose from 1.4 percent to 2.5 percent of GDP in the same period. This means that only 30 percent of the increase in spending (as a percent of GDP) was financed with additional municipal fiscal effort. Although the municipal circumstances are quite different from those of the departments, municipal vertical imbalances have also increased, which may have distorted the incentives towards efficiency and responsiveness of local governments.

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<sup>12</sup> The districts are territorial entities characterized by their political, historic, touristic, or industrial importance. Colombia has four districts: Bogota Capital District; Santa Marta Touristic, Cultural and Historical District; Cartagena Touristic, Cultural and Historical District; and Barranquilla as Special, Industrial, and Port District.

Figure 8 depicts the evolution of per capita total revenues by municipal categories and Bogota.<sup>13</sup>



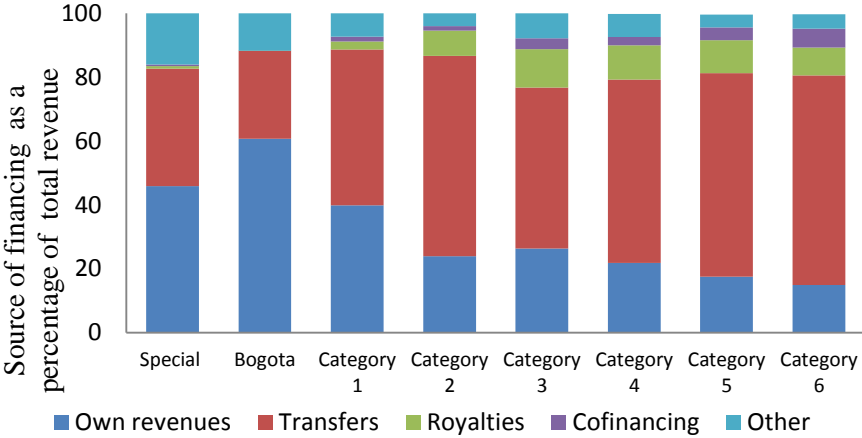
Source: Authors' calculations based on DNP data.

Figure 8. shows that municipal revenues have been steadily increasing since the mid-1990s, but their growth rates accelerated for all categories after 2002. As explained above, the change in the formula of transfer distribution with the creation of the revenue sharing mechanism and greater local tax collections explain the increase. Bogotá and the special category municipalities have the largest per capita own revenue (see Figure 8), while municipalities belonging to the fourth category have the lowest. The differences across types of municipalities are explained by the sharp differences in economic and social development. Bogotá and special category municipalities have more developed economies and large populations, while that the fourth, fifth, and sixth categories are characterized by low population and high poverty rates. In 2009, own revenues were the main source of financing for Bogotá and the municipalities in the special category. Thus, 60 percent of Bogotá's revenues are own revenues, as distinct from most other municipalities, for which the bulk of financing comes from central government transfers.

<sup>13</sup> This municipal classification is based on the Law 617 of 2000. The annex describes how it was done.

The municipal tax system is homogeneous across municipalities and includes 19 types of taxes and fees. Nevertheless, almost 90 percent of tax revenues are represented by the property and land tax, the commerce and industry tax, and the gasoline surcharge. Between 1996 and 2000, per capita municipal taxes did not change significantly. Since 2001, they began to steadily increase, reflecting in particular the behavior of the property and the industry and commerce (ICA) taxes. The dynamism in tax collection can be attributed to tax reform laws, such as Law 488 of 1998 and Law 788 of 2003 that increased the base for some sub-national taxes, such as the gasoline surcharge.

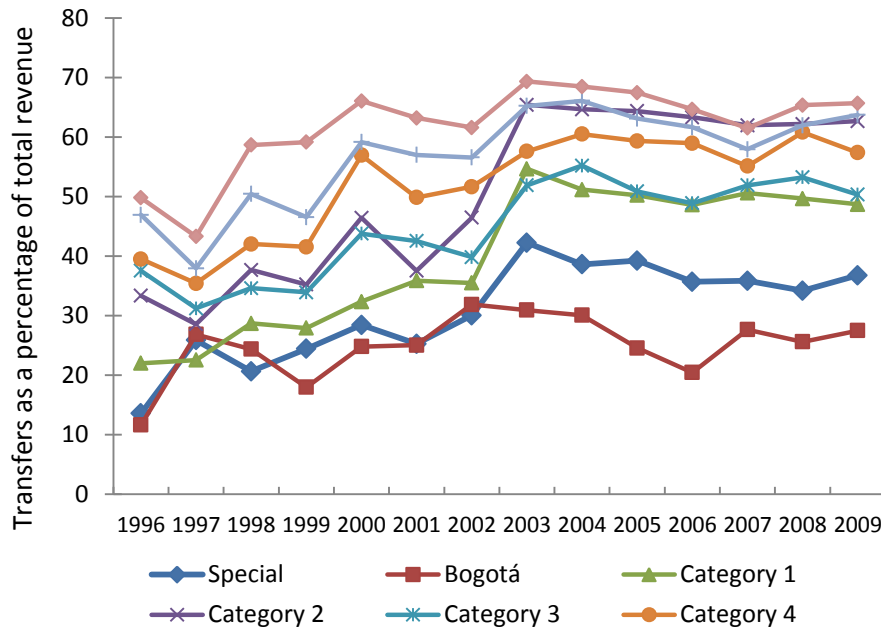
**Figure 9. Sources of Municipal Financing, 2009**



Source: Authors' calculations based on DNP data.

The municipalities in the third, fourth, fifth, and sixth categories are highly dependent on central government transfers. As shown in Figure 9, transfers account for approximately 50 percent of their revenues. It can be seen, however, that municipal fiscal dependency increased until 2003, remaining more or less constant afterwards, as own revenues grew.

**Figure 10. Fiscal Dependence by Municipal Category**



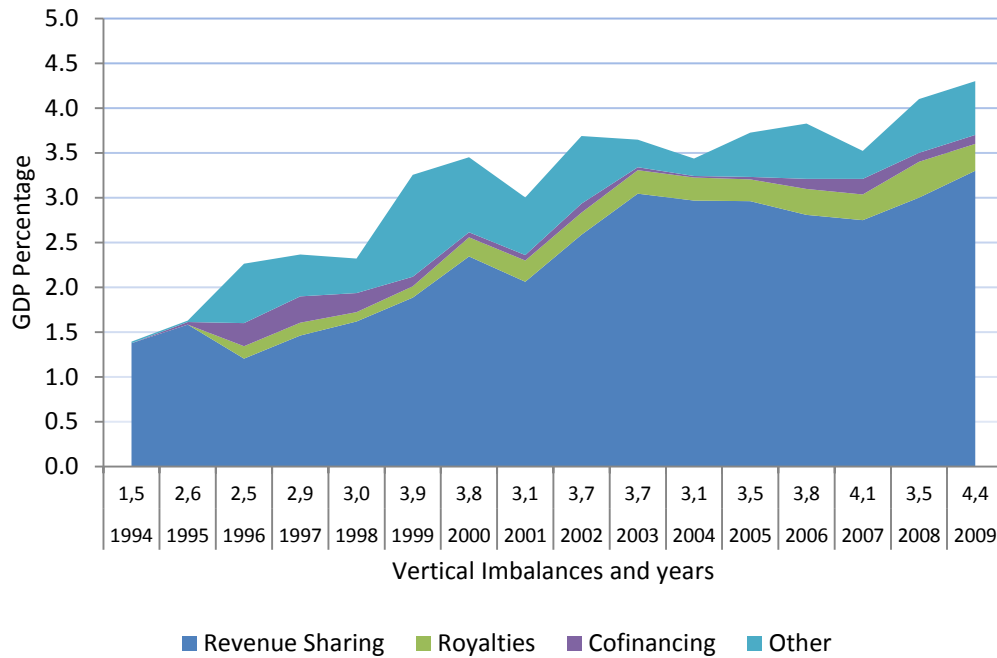
Source: Planning Department. Authors' calculations.

With respect to municipal spending patterns, Table 4 shows that current expenditures as a percentage of total expenditures have dropped sharply from the end of the 1990s to 2009 (line 1). Measures such as Law 617 of 2000, which imposed restrictions on operating expenses, mandating that they be financed with current, non-earmarked revenues, may have contributed to reducing current spending. Table 4 also shows the fiscal balances and the debt of municipalities as a percentage of GDP (lines 9 and 10). The fiscal performance of local governments improved after 2000, indicating that the measures implemented at the end of the 1990s positively affected municipal finances.

#### **4.2 Vertical Imbalance in the Municipalities**

Table 4 and Figure 11 illustrate the trends in own revenues, spending, different financing sources, and the vertical imbalances of municipalities between 1996 and 2009. They show that the vertical imbalance of municipalities increased over that period, as the rise of own revenues failed to keep up with the growth of spending. The most important financing source of the vertical imbalance was shared revenues, which rose from 1.2 percent to 3.3 percent of GDP. The remaining imbalance was financed with royalties, other transfers, and debt.

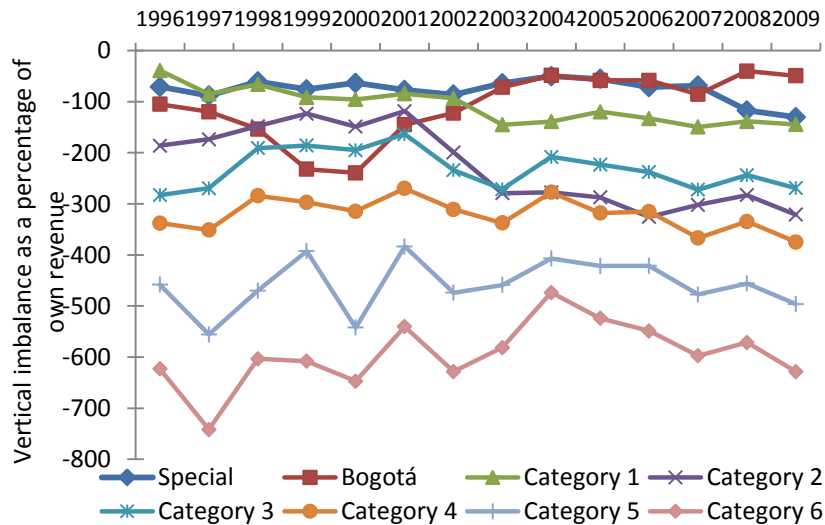
**Figure 11. Vertical Imbalance and Sources of Financing**



Source: Authors' calculations based on DNP data.

Figure 12 indicates that the municipalities in the fourth, fifth, and sixth categories exhibit the highest vertical imbalances. The most extreme case is that of the municipalities in the sixth category, which in 2009 reached an average vertical imbalance of more than six times their own revenues. Bogota's vertical imbalance, equivalent to 49 percent of its own revenues, was the lowest in that year.

**Figure 12. Vertical Imbalance by Municipal Category**



Source: Authors' calculations based on DNP data.

**Table 4. Revenues, Expenditures, and Vertical Imbalance of Municipalities (% of GDP)**

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1 Expenditure Function	3.0	4.1	4.4	4.7	5.0	5.9	5.6	5.0	5.7	5.9	5.5	5.9	6.3	6.4	5.8	6.8
1.1 Operating expenditure	1.7	1.8	1.1	1.4	1.5	1.6	1.5	1.3	1.3	1.2	1.1	1.1	1.0	1.0	0.9	1.1
1.2 Investment expenditure	1.3	2.4	3.3	3.3	3.4	4.4	4.1	3.7	4.4	4.7	4.4	4.9	5.3	5.4	4.8	5.8
1.2.1 Education	0.3	0.7	0.8	0.8	0.9	1.1	1.0	1.0	1.1	1.5	1.5	1.6	1.5	1.5	1.4	1.6
1.2.2 Health	0.3	0.4	0.6	0.7	0.8	0.9	0.9	0.9	1.2	1.1	1.2	1.3	1.5	1.5	1.3	1.6
1.2.3 Water and sewerage	0.2	0.3	0.5	0.5	0.5	0.6	0.7	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.6	0.7
1.2.4 Housing	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2
1.2.5 Other	0.3	0.9	1.3	1.2	1.2	1.6	1.4	1.1	1.5	1.5	1.0	1.3	1.6	1.6	1.4	1.7
2 Own revenues	1.4	1.6	1.8	1.8	1.9	2.0	1.8	1.8	2.0	2.2	2.3	2.4	2.5	2.3	2.3	2.5
2.1 Own tax revenue	1.1	1.2	1.2	1.3	1.5	1.6	1.5	1.5	1.6	1.7	1.8	1.8	1.9	1.9	1.9	2.1
2.1.1 Property and Land	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.6
2.1.2 Industry and Commerce	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9
2.1.3 Fee on gasoline	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2
2.1.4 Other	0.3	0.3	0.2	0.3	0.3	0.4	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4
2.2 Non-tax revenue	0.3	0.4	0.6	0.5	0.4	0.4	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.4	0.4	0.4
3 Vertical imbalance (2-1)	-1.5	-2.6	-2.5	-2.9	-3.0	-3.9	-3.8	-3.1	-3.7	-3.7	-3.1	-3.5	-3.8	-4.1	-3.5	-4.4
4 Sources of financing	1.4	1.6	2.3	2.4	2.3	3.3	3.5	3.0	3.7	3.6	3.4	3.7	3.8	3.5	4.0	4.4
4.1 Transfers	1.4	1.6	1.2	1.5	1.6	1.9	2.3	2.1	2.6	3.0	3.0	3.0	2.8	2.7	3.0	3.3
4.2 Royalties	0.0	0.0	0.14	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.4	0.3
4.3 Cofinancing	0.0	0.0	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.1
4.4 Other	0.0	0.0	0.7	0.5	0.4	1.1	0.8	0.6	0.8	0.3	0.2	0.5	0.6	0.3	0.6	0.6
5 Other expenditure	0.2	0.3	0.7	0.3	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5.1 Debt interest	0.2	0.3	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
5.2 Other current expenditure	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 Total revenues (2+4)	2.8	3.2	4.1	4.2	4.2	5.3	5.2	4.8	5.7	5.8	5.8	6.2	6.4	5.8	6.3	6.8
7 Total expenditure (1+5)	3.2	4.4	5.0	5.0	5.3	6.3	5.8	5.2	5.9	6.0	5.6	6.0	6.4	6.5	5.9	6.9
8 Fiscal Balance (6-7)	-0.4	-1.2	-0.9	-0.8	-1.1	-1.0	-0.6	-0.3	-0.3	-0.1	0.2	0.1	-0.1	-0.7	0.4	-0.1
9 Public debt			1.2	1.3	1.2	1.3	1.6	1.5	1.4	1.2	1.3	1.3	1.1	1.2	1.0	1.0
10 Debt/Own revenues			64.0	65.7	64.0	62.5	88.1	80.7	70.3	53.1	53.6	48.9	41.0	46.8	39.8	36.3

Source: Authors' calculations based on DNP data.



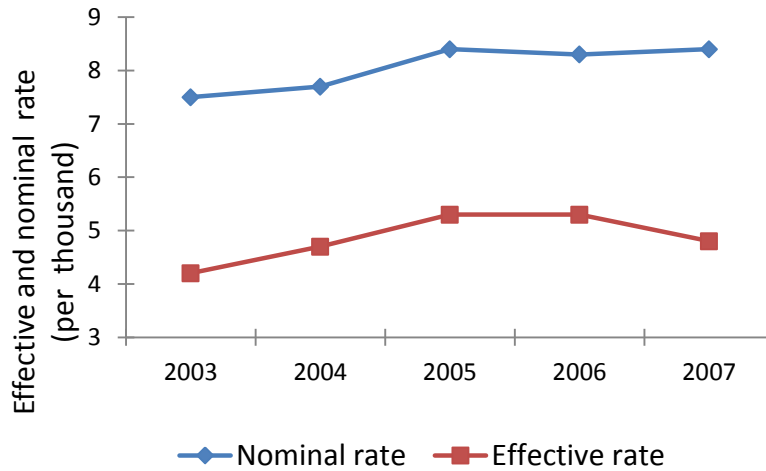
### ***4.3 Proposals for Municipal Revenue Mobilization***

To increase own revenues in the municipalities, we suggest strengthening the collection of both the property and land tax (PLT) and the industry and commerce tax (ICA). Those taxes comprise most of the own revenues of municipalities, have been very dynamic in recent years, and yet continue to be a potential source of additional revenues. In fact, the effective rates of both types of taxes are far below what is permitted by law and, in the case of the property and land tax, the base is significantly undervalued and under-reported.

The PLT is regulated by Law 44 of 1990. This law indicates that the determination of the tax base and rates are the responsibility of local governments. It establishes that the municipal councils should determine the property tax rate in a range between 1 and 16 per thousand, with the exception of developable land and urban land not constructed, where rates can reach up to 33 per thousand. The articles indicate that the tax rates are set by the municipal council within that wide range and according to progressivity criteria.

As for the cadastre, Colombia has a specialized office, the Instituto Geográfico Agustín Codazzi (IGAC), in charge of assessing the value of both urban and rural properties across Colombian municipalities. Only the municipalities of Antioquia (department), Medellín, Cali, and Bogotá have their own cadastral offices. A reform of the property tax rates was included in the new National Development Plan recently passed by the Congress. It establishes that municipal councils should set the property tax rates within a range of 0.5 percent to 1.6 percent for properties belonging to the richer categories (levels 4, 5, and 6). For the poorer ones (1, 2, and 3) the rate will be kept within the range 0.1 percent to 1.6 percent.

**Figure 13. Effective and Nominal Rates of the Property and Land Tax**



*Source:* DNP-IGAC Survey, 2008. Based on 39 municipalities. Conpes 3557.

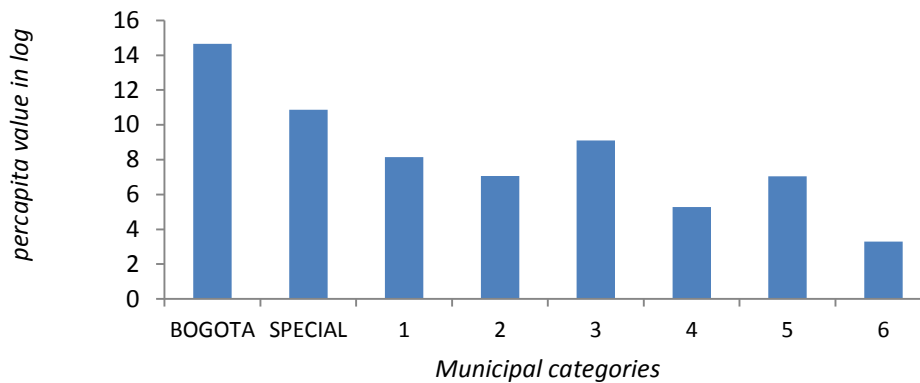
Nevertheless, according to the DNP-IGAC, it was found (based on data for 39 municipalities) that not only are the effective rates of the property and land tax low, but the nominal rates are also low (Figure 13). The gap between the nominal and effective rates can be explained by discounts for prompt payment, exemptions for some properties, delays by taxpayers, among others (CONPES, 3557). Iregui et al. (2003) found that the above-mentioned gap ranges between 2 and 5 per thousand and could be explained by exemptions and exclusions granted by municipal councils, problems with administration and management, and the violence that affects many areas of the country. Nevertheless, the chief reason is limited local capacity to collect taxes efficiently. According to Smolka and De Cesare (2008), factors such as the updating of property cadastre and tax evasion, in addition to low local per capita income, explain why some local governments succeed or fail in property and land tax collection.

The industry and commerce tax (ICA) represents nearly 40 percent of own tax revenues. The ICA is regulated by Law 14 of 1983 that established that such a tax must be levied on the gross revenues of all commercial, industrial, and service activities in municipal jurisdictions. Again, as is the case of the property tax, the municipal councils define the rate within the following ranges: from 2 to 7 per thousand for industrial activities and from 2 to 10 per thousand for commercial and service activities. In addition, in many municipalities, the ICA tax base is under-reported, and evasion and avoidance are quite high.

### 4.3.1 Calculation of the Effective Property and Land Tax Rate

The effective rate of the property and land tax is the ratio of the collected property tax and the total value of the cadastral properties.<sup>14</sup> Figure 14 depicts the per capita assessed value of properties in millions of COL\$. As expected, the largest and richest municipalities exhibit the highest per capita cadastre value (Bogota and special category). Bogota's per capita annual cadastre value averaged COL\$14.65 million (in 2005 pesos) between 2006 and 2009, whereas for the municipalities in the sixth category, the average per capita cadastre value was COL\$3.3 million (in 2005 pesos)—less than one-fourth the amount for Bogotá.

**Figure 13. Per Capita Cadastral Assessment Value by Municipal Category**

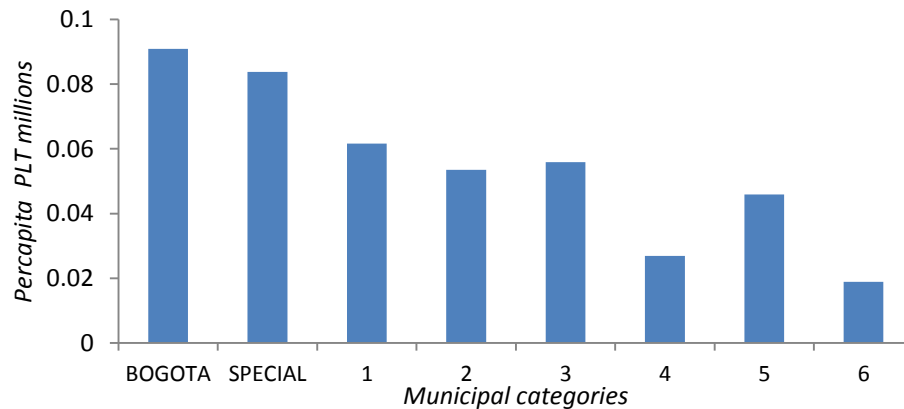


Source: IGAC, DNP.

Likewise, the per capita tax level is higher in municipalities with large populations and higher per capita income. The municipalities in the fourth and sixth categories have the lowest per capita collection.

<sup>14</sup> The data on property tax collection come from the National Planning Department (DNP), while the total assessed value of municipal properties both urban and rural is obtained from Cadastral Management Office (IGAC) and the Cadastral Office of Bogotá. The data do not include the cadastres of Antioquia, Medellín, and Cali, as they have their own cadastral offices.

**Figure 14. Per-Capita Property Tax by Municipal Category  
(average 2006-2009 in millions of \$COL, 2005)**



Source: IGAC and Authors' calculations

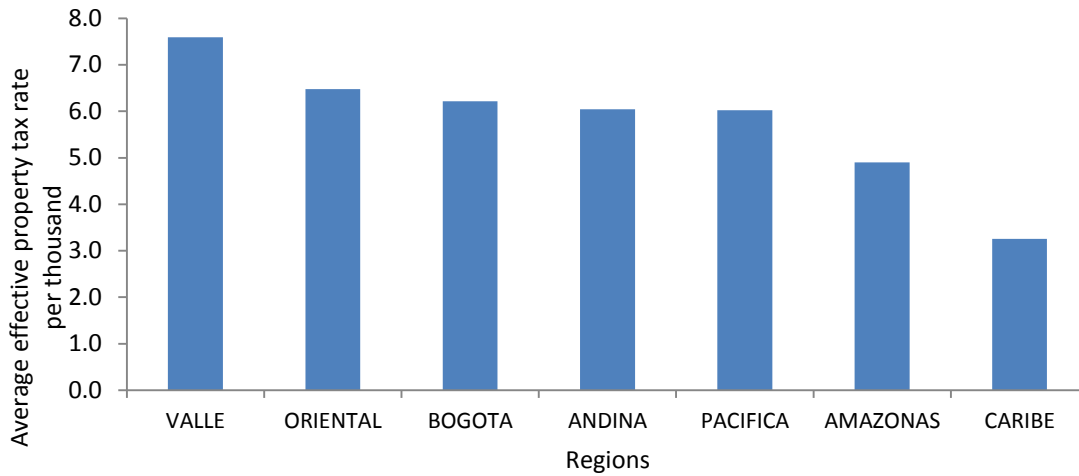
The effective property and land tax rate also varies across the different categories of municipalities and regions. Figure 16 shows the effective property tax rates by region, indicating that there are significant differences across regions. For instance, the municipalities from Valle have on average an effective rate close to 8 per thousand, while the rate in the municipalities in the Caribbean region is barely above 3 per thousand.

As:

- $PLT \text{ effective rate} = (PLT \text{ revenue} / \text{Assessed value of properties})$
- $PLT \text{ revenue} = \text{nominal rates} * \text{Assessed value of properties} \text{ minus efficiency losses minus discounts}$
- $\text{Assessed value of properties} = (\text{number of properties} * \text{average price of properties})$

Multiple factors come into play in the determination of effective PLT rates. From the above descriptions, it is apparent that PLT base is determined by both the number of properties and their prices. Thus, the PLT base is closely related to the behavior of cadastral updates. Applying the same nominal rates to an enhanced tax base would increase PLT revenues by amounts that depend upon the under-assessment of properties. As we will see in the next section, such under-assessment is strongly and positively linked to the lack (or infrequency) of cadastral updates.

**Figure 15. Distribution of Effective Property Tax Rates, 2006-2009**

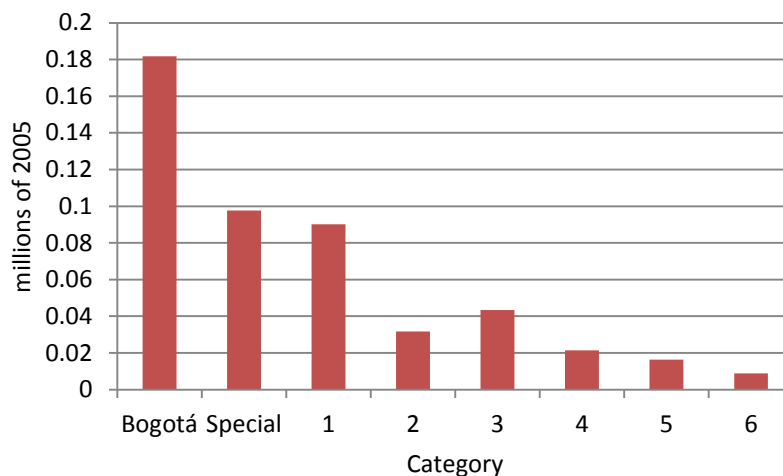


Source: IGAC. Authors' calculations.

#### 4.3.2 Calculation of Effective Rates of Industry and Commerce Tax

The calculation of the per capita Industry and Commerce Tax (ICA) by municipal category is presented in Figure 17. Not surprisingly, the richest municipalities (Bogotá and those in the special and first categories) have the highest per capita ICA revenues. For the other categories, ICA collections are much lower. The variance in ICA revenues is strongly correlated with differences in the level of economic activity across municipalities.

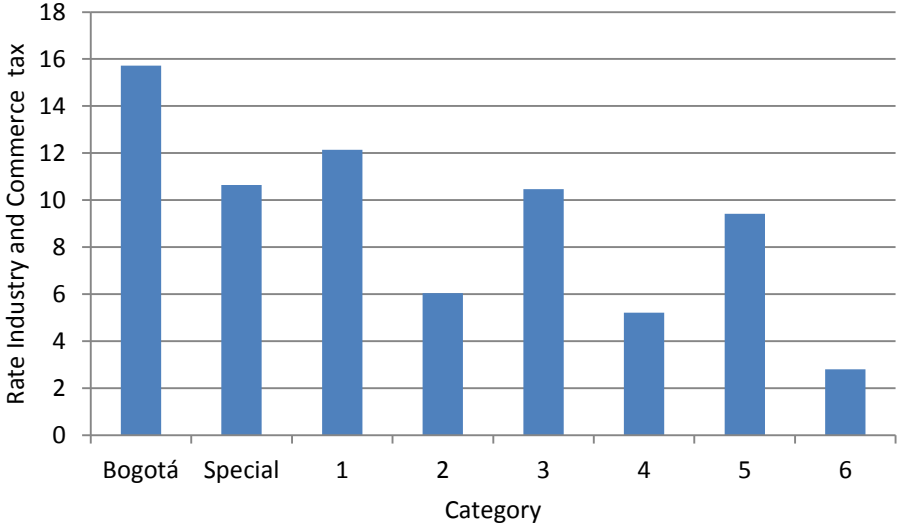
**Figure 16. Per Capita ICA Revenue by Municipal Categories**



Source: DNP. Authors' calculation.

The ICA rates—calculated as the ICA revenues/municipal GDP (see appendix for the GDP calculations)—by municipal category are shown in Figure 18, where it is observed that Bogotá, the special, and the first categories have the highest rates, while for the rest the rates are below 10 per thousand. Thus, only the municipalities with relatively wealthy and large populations have been able to obtain significant resources from the ICA. Nevertheless, the lack of information on the ICA tax base (GDP is only the potential tax base) makes it difficult to determine whether the variance in per capita ICA revenues is due to differences in nominal rates, local information on ICA bases, or local economic activity.

**Figure 17. ICA Tax Rates by Category**



Source: Authors’ calculations based on DNP and DANE data.

**4.4 Determinants of Tax Rates and Tax Burdens**

**4.4.1 Determinants of Property and Land Tax Rates**

The objective of this section is to identify the factors that influence property and land tax rates, per capita PLT revenues, and per capita assessed land values at the municipal level. Based on the total assessed value of properties obtained from the IGAC and the property and land tax collection, we computed the PLT effective rates from 2000 to 2009. Then, we estimated panel models, with fixed effects of municipality and year, for the likely determinants of PLT effective tax rates, per capita PLT revenues and per capita property value assessment—total, urban and rural. Thus, the model to estimate is the following:

$y_{it} = f(\text{Socioeconomic variables, decentralization variables, tax base variables, policy and institutional variables})$

Among the socio economic variables, we include the land Gini coefficient, poverty rate, urbanization rate, and per capita GDP. The decentralization variables are represented by central government transfers, the tax base variables are per capita cadastral value assessment of local properties—total, urban and rural—and the policy and institutional variables include information on the cadastral updates. Other relevant institutional variables, such as the existence of information systems to collect property taxes, are available only for 2005, and therefore are not included in the model.

The regression results of PLT effective rates are shown in column 1 of Table 5. The coefficient for the land Gini is positive, although not significant. As expected, higher urbanization rates and larger per capita GDP are associated with higher PLT rates. Transfers from the central government are not related to PLT rates. The coefficient (a semi- elasticity) is close to zero and not significant. The tax base (per capita value property assessment) is negatively related to the effective PLT rate although this may be just a “denominator” effect, since effective rates become lower as the tax base widens. A different interpretation of the coefficient may be that, the larger the tax base, the lower the fiscal effort needed to fund the same set of public goods, which would be reflected in lower PLT rates. Finally, the lack of cadastral updates is not related to the effective PLT rates, indicating that, when the tax base erodes or its growth slows down, local authorities do not modify tax rates to offset the relative shrinking of the tax base.

**Table 5. Determinants of Property and Land Tax Rate, Tax Burden And Property Values**

VARIABLES	Effective Property and Land Tax Rates	Per capita Property and Land tax revenue	Per capita Property and Land Value	Per capita Urban Property and Land Value	Per capita Rural Property and Land Value
<b>Socio-Economic Variables</b>					
GINI of value of properties	1.748 [1.451]	0.345 [1.623]	0.441*** [4.693]	0.517*** [5.090]	1.233*** [9.662]
UBN (Poverty Index)	2.372* [1.713]	0.147 [0.603]	-0.110 [-1.011]	-0.237* [-1.742]	-0.166 [-0.975]
Urban Population (Percentage)	3.474*** [2.929]	0.991*** [4.742]	0.865*** [9.109]		
Per capita GDP (log)	1.364*** [4.356]	0.328*** [5.953]	0.522*** [21.87]	0.431*** [14.36]	0.602*** [15.94]
<b>Fiscal Variable</b>					
Per capita Transfers (log)	0.0371 [0.375]	0.0459*** [2.629]		-0.00457 [-0.447]	0.0610*** [4.751]
<b>Fiscal Base</b>					
Per Capita Value Assessment of Property (logs)	-2.995*** [-19.84]	0.157*** [6.043]			



**Table 6. , continued**

VARIABLES	Effective Property and Land Tax Rates	Per capita Property and Land tax revenue	Per capita Property and Land Value	Per capita Urban Property and Land Value	Per capita Rural Property and Land Value
<b>Policy</b>					
Years to last Update of Property Cadastre (urban)	0.00271 [0.257]	- 0.00496*** [-2.682]	-0.0244*** [-30.53]	-0.0684*** [-72.58]	-0.000407 [-0.343]
Years to last Update of Property Cadastre (rural)	0.0144 [1.488]	- 0.00708*** [-4.177]	-0.0307*** [-44.38]	0.00314*** [-3.981]	-0.0433*** [-43.66]
Constant	22.59*** [14.56]	-7.033*** [-25.96]	6.297*** [67.23]	6.618*** [60.25]	6.164*** [44.63]
Observations	8278	8282	8672	8828	8824
Municipalities	910	910	912	935	935
R-squared	0.188	0.183	0.721	0.709	0.521
F	100.1	97.18	1334	1278	569.9
Municipal fixed effects	YES	YES	YES	YES	YES
Year Fixed Effects (2000-2009)	YES	YES	YES	YES	YES

t-statistics in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: DNP-DANE. Authors' calculations.

The regression for per capita PLT revenue indicates that, as expected, the percentage of urban population and the per capita local GDP are positively and significantly related to revenues. These results may involve the many positive outcomes associated with GDP and urbanization, such as better efficiency in revenue collection, lower marginal costs of collection, and others. The coefficient of per capita transfer from the central government has a positive and significant sign, which confirms the results of Cadena (2002), of the non-existence of “fiscal laziness” in Colombian municipalities. In fact, it appears that local governments are willing to raise tax rates if they may provide more public goods relying on financing coming from central government transfers.

The per capita value of cadastre, as expected, has a positive influence on PLT revenues, but with elasticity equal to 0.15, indicating that increases in the tax base would be only partially reflected in higher PLT revenues. This result is consistent with the negative relationship between the assessed values of properties and PLT effective rates (see column 1). Likewise, as expected, there is a negative relationship between “years since the last cadastral update,” both urban and rural, and PLT revenues. Both coefficients are highly significant but small (0.005 for urban and 0.007 for rural). Thus, if the cadastre is updated, for instance, after 10 years, PLT revenues would only increase by 12 percent.

Columns 3, 4, and 5 contain the coefficients of regressions for the total assessed value of properties, both urban and rural. The socioeconomic variables have the expected sign. The concentration of properties (Gini) is strongly and positively associated with the value of land. This result may be due to stronger property rights or to less informality as the land concentration increases, which would reflect the value of properties. Land Ginis tend to vary little across time in the same municipality and yet their dynamics sharply impact local land markets. Higher urbanization rates and per capita GDP are associated with greater per capita value of properties, which may reflect both scarcity and greater demand for land.

Finally, the “years since last update of urban and rural property cadastres” have the expected negative sign on the assessed value of property. These results hold for the total value of properties and for both urban and rural ones. The magnitude of the coefficients is quite substantial. Thus, one additional year since the last cadastral update leads to an undervaluation of properties of 7 percent in urban areas and of 4.3 percent in rural areas. In

2009, the average number of years since the last urban cadastral update was around five in Colombian municipalities. This means that the compound loss of the PLT base due to the failure to update was more than 40 percent. The estimations for Colombia are corroborated by other studies. For instance, Bahl and Wallace (2008) found that a great obstacle to property and land tax collection is undervaluation of properties and land. Similar results regarding the effects of the cadastral update were found by Smolka and De Cesare (2010) for Brazil, and by Iregui (2004) for Colombia.

#### *4.4.2 Determinants of the Industry and Commerce Tax Rate*

A similar model was estimated for the determinants of the ICA rates, the results of which are reported in Table 7. The estimation showed no correlation between the ICA rate and the Gini coefficient. The poverty index (Unmet Basic Needs, or UBN), as anticipated, has a negative relationship, while the percentage of urban population has a positive one, pointing to the greater presence of activities that comprise the ICA base in urban communities.

Similarly to the property tax rate, central government transfers are positively related to ICA rates. Several factors may explain this result. On the one hand, transfers may incentivize fiscal effort and efficiency by local governments when local authorities perceive that the marginal cost of providing a local public good partially financed with transfers is lower than its marginal benefit. On the other hand, transfers may raise local economic activity, which may positively impact ICA revenue and hence increase effective ICA rates.

**Table 7. Determinants of the Industry and Commerce Tax Rate and Tax Revenues**

VARIABLES	Industry and Commerce Tax Rate (effective)	Per capita ICA Revenue (log)
Property GINI	-0.634 [-1.491]	-0.118 [-0.392]
UBN	0.863 [1.390]	1.658*** [3.761]
Urban Population (Percentage)	2.415*** [4.670]	1.826*** [4.973]
Per capita Transfers (log)	0.111** [2.384]	0.0438 [1.321]
Per capita GDP (log)	-1.539*** [-11.13]	0.341*** [3.473]
Constant	2.691*** [5.213]	-8.442*** [-23.02]
Observations	8741	8741
Municipalities	935	935
R-squared	0.064	0.233
F	37.89	168.8
Municipal Fixed effects	YES	YES
Year Fixed Effects (2000-2009)	YES	YES

t-statistics in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Authors' calculations based on DNP-DANE- IGAC data.

The proportion of urban of population is positively related to the ICA rate. Thus, the most urban municipalities tend to have the most economic activities, which may facilitate—through economies of scale or less evasion and avoidance—more efficient tax collection. GDP per capita is negatively related to ICA rates, a result similar to the relationship between the value of cadastre and property tax rates. It seems that local authorities aim to raise more revenue. Thus, the greater the tax bases the lower the tax

rate.<sup>15</sup> The determinants of the per capita ICA revenues (in logs) are also shown in Table 6. Again, the relationship between the Gini coefficients and the per capita ICA is not significant, while the relationship with the poverty index is positive.<sup>16</sup> Percentage of urban population also has a positive coefficient, indicating that the variable is related to activities that comprise the ICA base. As expected, per capita GDP is positively associated with per capita ICA, but with a low elasticity. If economic activity increases by 1 percent, ICA revenues only rise by 0.34 percent, which is consistent with the negative relationship between ICA rates and per capita GDP.

#### ***4.5 Fiscal Effort Determinants of Colombian Municipalities: A Stochastic Frontier Analysis<sup>17</sup>***

##### *4.5.1 A Stochastic Frontier Analysis for PLT and ICA Taxes*

In this section we report the estimates of the efficiency rates for the PLT and ICA taxes (see Appendix 2 for an explanation of the methodology). The independent variables are the logarithm of the per capita PLT and ICA taxes. The explanatory variables are per capita GDP and the local poverty rate with the following specification:

$$\text{Ln}(PLTCp)_{it} = \beta_0 + \beta_1(GDP)_{it} + \beta_2\text{Ln}(UBN)_{it} + \beta_3t + e_{it}$$

where  $\text{Ln}(GDP)_{it}$  is the per capita GDP in the municipality at time  $t$  ( $UBN)_{it}$  is the index of Unmet Basic Needs,  $t$  are year dummy variables and  $e_{it}$  is an error term.<sup>18</sup> We choose GDP per capita and UBN as the variables that most likely would reflect the potential of both taxes. As shown in Tables 5 and 6, GDP is positively associated with the value of properties, which is the PLT tax base, and with economic activity, which is the ICA tax base. The UBN is negatively linked to the payment capacity of households and to the potential value of properties. Thus, municipalities with the same GDP per capita may exhibit differences in the average price of properties because such properties may have—on average—worse physical conditions and hence have a higher UBN index. The stochastic frontier estimations for the two types of local taxes presented in Table 7 indicate that the

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<sup>15</sup> This result is robust to any specification of the regression. Running ICA rate only on GDP per capita, the magnitude of the coefficient is similar to that in the more complete model (-1.53).

<sup>16</sup> This is an unexpected result that persists even in a univariate model, in which the coefficient of the poverty index is significant at 1 percent and equal to 1.43.

<sup>17</sup> A brief explanation of the stochastic frontier technique is provided in Appendix 2

<sup>18</sup>  $e_{it}$  is an error term with two components:  $V_{it}$ , the random disturbance, and  $U_{it}$ , the non-positive non-random disturbance (see appendix for details).

per capita GDP is, as anticipated, positively linked to potential per capita revenue, while UBN is negatively related to it.

**Table 8. Maximum Likelihood Estimator for Municipal Property and Land Revenue**

Variables	Property and Land Tax	ICA
Per capita GDP	0.466*** [13.03]	0.578*** [10.64]
UBN	-3.337*** [-23.36]	-3.138*** [-15.02]
$\mu$	2.135*** [12.50]	3.257*** [16.91]
$\sigma^2$	-0.290*** [-6.743]	0.615*** [14.50]
$\gamma$	1.625*** [28.18]	1.619*** [28.33]
Constant	-1.733*** [-8.276]	12.12*** [48.21]
Observations	4234	4257
Municipalities	1061	1066
Year Fixed Effects (2006-2009)	YES	YES

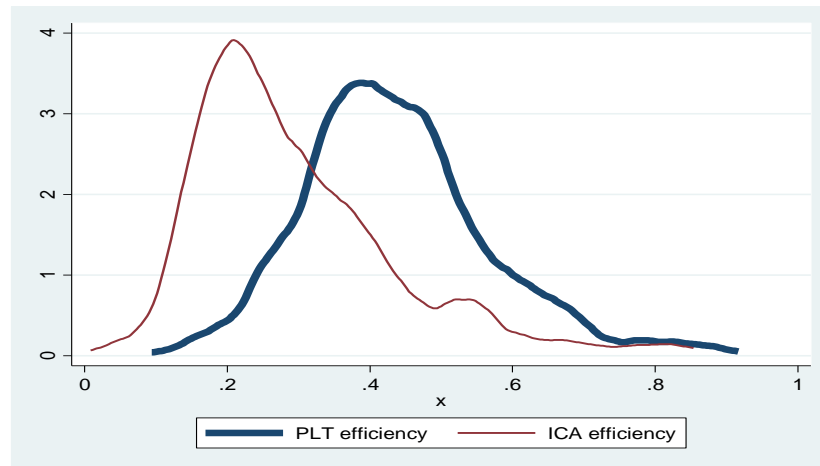
z-statistics in brackets

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: Authors' calculations based on DNP-DANE data.

Figure 19 presents the distribution of the efficiency rates for the ICA and PL taxes. It is evident that efficiency is greater for the PLT than the ICA tax, which is skewed to the left. This result may be due to the fact that rural and small municipalities do not update the ICA base, which facilitates evasion and avoidance. Although the ICA base may be updated there does not exist a standard updating procedure to do so as in PLT base case.

**Figure 18. Distribution of the Efficiency Rates of ICA and PL Tax Revenues (2006-2009)**



Source: DNP, IGAC, DANE. Authors' calculations.

Table 8 shows the efficiency estimates by region and municipal category. In Table 8, the municipalities are aggregated by the five Regions: Andina, Oriental, Pacífica, Caribe and the Amazonía. The technical efficiency of the property and land tax collection averages (unweighted) around 43 percent for 2009, although there are significant differences between regions. The Oriental and Andina Regions present the highest technical efficiency, while the Amazonía and Caribbean Regions have the lowest. This last result confirm the finding of Iregui et al. (2003) that, due to inefficiency, the Caribbean Region showed the lowest rate of property and land tax, according to a study of 309 municipalities between 1999 and 2002.

**Table 9. Municipal Efficiencies in Tax Collection by Regions and Categories in 2009**

Property and Land Tax				ICA			
Region	Efficiency	Category	Efficiency	Region	Efficiency	Category	Efficiency
		Special	53.6			Special	53.5
Oriental	45.5	1	51.8	Oriental	40.9	1	45.0
Amazonía	39.5	2	51.3	Amazonía	34.8	2	46.7
Andina	45.0	3	49.6	Andina	29.2	3	47.0
Caribe	40.0	4	45.1	Caribe	29.7	4	44.0
Pacífica	42.8	5	50.8	Pacífica	25.9	5	44.8
		6	43.0			6	27.8
Total	43.6	Total	43.6	Total	29.6	Total	29.5

Source: Authors' calculations based on DNP-DANE data.

Table 8 also displays the PLT's efficiency calculations by municipal category. The special category exhibits the highest efficiency. Bogota and other large Colombian cities are in this category. The other categories of municipalities have lower PLT efficiency rates. Municipalities in category 6—the smallest and poorest—have the lowest efficiency rate.

The efficiency rates of the ICA tax is also presented in Table 8. Special category municipalities exhibit the highest ICA efficiency, similar to the PLT. For the other municipal categories, ICA efficiency is lower than in the PLT case. This pattern indicates that municipalities, particularly small ones, have tremendous potential to collect revenues from the ICA tax. Nevertheless, the ICA tax base in most municipalities is outdated, and there are no institutionalized mechanisms or processes to update it as there are for the cadastre.

#### *4.5.2 What Explains Efficiency Rates?*

The efficiency rate in tax revenue collection is likely to be explained by structural characteristics of the municipality, such as land concentration, the degree of urbanization, the structure of production, that is, the share of sectors in GDP, the area of the municipality, and by policy variables such as the administrative capacity index of local government, reported by the National Planning Department,<sup>19</sup> and the lack of a cadastral update in the case of the PLT. The results of econometric estimations of the determinants of efficiency rates are presented in Table 9.

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<sup>19</sup> The National Planning Department has calculated this index since 2005. It is calculated as the simple average of indicators of stability of management personnel, education, and training of local public servants, the existence of computers for administrative tasks, automation of general processes, and internal control.



**Table 10. Determinants of Efficiency Rates (2005-2009)**

Variables	Property and Land Tax	ICA
<b>Structural Variables</b>		
GINI of value of properties	0.367*** [13.27]	0.234*** [7.999]
Urban Population (Percentage)	-0.0370*** [-3.086]	0.134*** [10.29]
Manufacture GDP (percentage)	-0.0780*** [-4.617]	-0.0896*** [-4.871]
Service GDP (percentage)	0.0521*** [2.898]	0.0768*** [4.142]
Area	0.0180*** [7.468]	0.0318*** [12.29]
<b>Decentralization and Policy Variables</b>		
Per capita Transfers (in log)	0.0250*** [4.514]	0.00587 [0.974]
Years to last Update of Property Cadastre (ur	0.000167 [0.296]	
Years to last Update of Property Cadastre (ru	-0.00398*** [-7.829]	
Administrative Capacity	0.0633*** [4.995]	0.0560*** [4.045]
Constant	0.00797 [0.0721]	-0.169* [-1.830]
Observations	2703	2890
R-squared	0.302	0.292
F	30.40	30.13
Departmental fixed effects	YES	YES
Year Fixed Effects (2006-2009)	YES	YES

t-statistics in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Authors' calculations based on.DNP-DANE data.

Table 9 points to a positive and significant relationship between efficiency rates and the concentration of land and the share of services in GDP. The percentage of urban population also positively influences the ICA efficiency rate, which indicates that the collection of this tax may be easier when local economic activity is more concentrated and evasion and avoidance more easily detected. The lack of an updated rural cadastral also negatively influences the efficiency rate. The lack of an urban update variable is not significant. Local administrative capacity is positively correlated with efficiency. Thus, a more stable and educated bureaucracy, together with computers and more automation of

processes, favors a more efficient revenue collection in both types of local taxes. This result implies that improvement in administrative capacity by local governments will greatly improve their fiscal capacity.

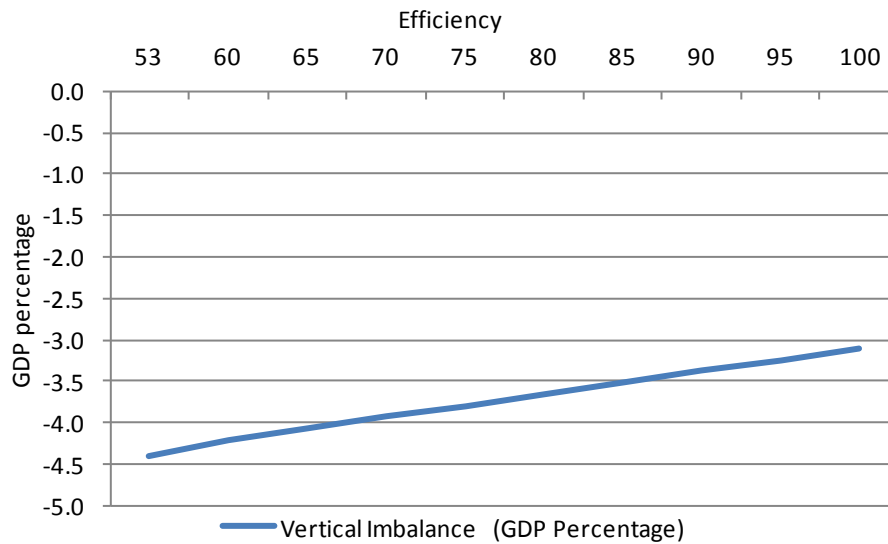
#### *4.5.3 Simulations of Changes in the Efficiency of Revenue Collection for Property and Land Tax and Industry and Commerce Tax*

The results of the analysis of efficiency in tax collection point to the need for municipalities to improve the collection of existing taxes. In this section we present the results of simulating improvements in the efficiency of revenue collection for the PLT and the ICA. Two simulation exercises were undertaken to determine how the indicators of vertical imbalances would change at different values of collection efficiency. The scenarios are the following:

- Simulation 1: increase of the average efficiency in revenue collection from its current value to 100 percent efficiency. Then it will be established how vertical imbalance as a percentage of GDP would vary.
- Simulation 2: increase of the average efficiency in revenue collection from its current value to 100 percent efficiency for the municipalities belonging to special and 1 categories, on the one hand, and for the municipalities belonging to category 6, on the other. Then it will be established how vertical imbalance as a percentage of local own revenues would vary.

Simulation 1 was carried out in 1,089 municipalities for 2009. Figure 20 displays the vertical imbalances of the municipalities under different efficiency rates. In 2009, the observed vertical imbalance as a percentage of GDP was 4.4 percent. If efficiency in tax collection increased from its current value of 53 percent to 75 percent, local taxes would increase from 1.4 percent to 2.0 percent of GDP and the vertical imbalance would change from -4.4 percent to -3.8 percent of GDP. If efficiency is equal to 100 percent, local taxes would jump to 2.7 percent of GDP and the vertical imbalance would be -3.1 percent of GDP. The improvement in vertical imbalance implies the strengthening of fiscal effort by local governments.

**Figure 19. Vertical Imbalance and Efficiency Rates in Local Tax Collection (% of GDP)**



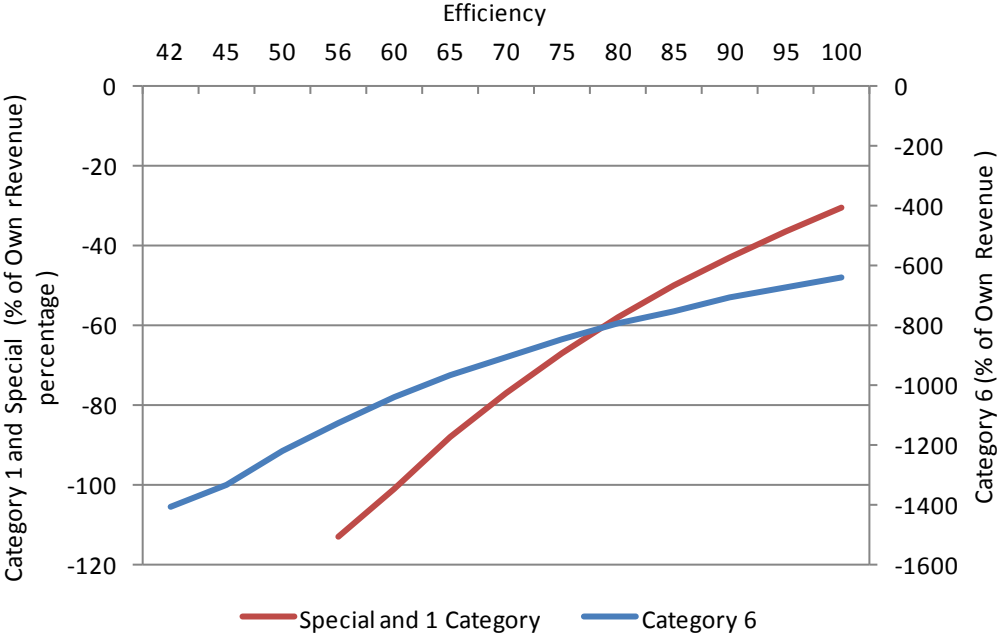
*Source:* Authors' calculations based on DNP, IGAC, DANE.

Simulation 2 was carried out for two subsets of municipal categories. The left axis of Figure 21 depicts how vertical imbalance as a percentage of own resources would change if efficiency in tax collection increased for the categories special and 1—the richest municipalities—from its current 55 percent to 100 percent. Twenty-two (out of 1089) municipalities belong in these categories and collect 74 percent of all local taxes. According to the graph, in 2009 the vertical imbalance of these municipalities was equal to 113 percent of their own revenues. If efficiency increases to 75 percent, vertical imbalance becomes 67 percent of own revenues, and if it jumps to 100 percent, the vertical imbalance would be 30 percent of own revenues. It is apparent that, with some improvement in efficiency—whether by improving administrative capacity or updating the cadastre—the largest municipalities will be able to greatly decrease their vertical imbalance.

The right axis in Simulation 2 of Figure 20 estimates the vertical imbalances for category 6. The number of municipalities belonging to these categories is 992 (out of a total of 1089). They are the majority, but they account for 9 percent of all local taxes. According to Figure 21, in 2009 the efficiency of tax revenue of these municipalities was 42 percent and their vertical imbalance was 1,400 percent of their own revenues. If efficiency increases to 75 percent, vertical imbalance becomes 850 percent of their own

revenues, and if efficiency reaches 100 percent, vertical imbalance becomes 680 percent of own revenue. The simulations indicate that even with a significant fiscal effort the vertical imbalances of these municipalities would continue to be very high. Nevertheless, lowering fiscal imbalances and providing more local public goods with own revenues will certainly help improve the efficiency and responsiveness of the local governments.

**Figure 20. Vertical Imbalance and Efficiency Rates in Local Tax Collection (% of Municipality’s Own Revenue)**



Source: Authors’ calculations based on DNP, IGAC and DANE data.

**5. Conclusions and Recommendations**

This paper has discussed the impact of fiscal decentralization on sub-national public finances. It suggests that decentralization increased transfers to sub-national governments, but it did not promote or incentivize the generation of own resources by these governments. The inelasticity of departmental taxes—most of which are taxes on vices—led to significant increases in the departments’ vertical imbalances. In contrast, own resources of municipalities grew over time, but not enough to maintain their vertical imbalances constant; in fact, they widened. One of the main achievements of the process was the

stabilization of the sub-national debt, which at the end of the 1990s was on the verge of becoming unsustainable.

As a way of mobilizing new revenues for the departments, two new taxes are proposed. The first is a VAT surcharge of 2 percent, which would reduce the total departmental vertical imbalance by about 0.5 percent of GDP (from 4.4 percent to 3.9 percent), albeit with large variations across departments. For instance, Antioquia would reduce its vertical imbalance by 0.8 percent of GDP, Huila by 0.2 percent, and Putumayo by 0.1 percent. Those differences reflect the proportion of GDP subject to the VAT, which tends to be larger in the more developed regions. The second is a retail sales tax of 5 percent, which could reduce departmental vertical imbalance by as much as 0.8 percent of GDP. Both the IVA surcharge and the retail sales tax can be collected by the DIAN, but the approval and the “political cost” of these taxes should be borne by the departmental governments.

The municipalities have several options to mobilize new own resources. First, they could increase their efficiency in tax collection. Efficiency—both for ICA and PLT—is low across all municipalities. The vertical imbalance could be reduced from its current 4.4 percent up to 3.0 percent with improvements in efficiency, albeit with significant variation between municipalities.

The most important steps that could be taken to raise local efficiency indicators are the following:

- Strengthen the tax collection administrative capacity through investment in information systems. Such investments would allow municipalities to monitor economic activity—the ICA tax base—within their borders and to facilitate payment of both the ICA and the PLT by taxpayers.
- Update the cadastre more frequently.
- Create or update the ICA tax base through censuses of local economic activity.

This will require both that the central government design better incentives to stimulate local revenue efforts and that local authorities improve taxpayer compliance, by, among other things, convincing citizens that their taxes will in fact be used for the

provision of public goods with transparency and accountability. Although central government transfers are positively related to fiscal effort, the elasticity of local taxes to these transfers is relatively low—around 0.05—which means that although local governments may complement transfers with local taxes to provide more local goods transfers, such complementarity may be insufficient to enhance responsiveness and efficiency in the provision of public goods.

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## Annexes

### Annex 1

#### Departmental Categories

Category	Population	Current revenues of free destination (annually)
Special	>= 2.000.000	> 600.000 SMLMV
First	Among 700.001 and 2.000.000	> 170.001 and 600.000 SMLMV
Second	Among 390.001 and 700.000	>122.001 and 170.000 SMLMV
Third	Among 100.001 and 390.000	> 60.001 and 122.000 SMLMV
Fourth	<= 100.000	>= 60.000 SMLMV

Source: Law 617 of 2000.

#### Municipal Categories

Category	Population	Current revenues of free destination (annually)
Special	>= 500,001	> 400,000 SMMLV,
First	Between 100,001 and 500,000	> 100,000 and 400,000 SMLMV
Second	Between 50,001 and 100,000	>50,000 and 100,000 SMLMV
Third	Between 30,001 y 50,000	> 30,000 and 50,000 SMLMV
Fourth	Between 20,001 y 30,000	> 25,000 and 30,000 SMLMV
Fifth	Between 10,001 y 20,000	> 15,000 and 25,000 SMLMV
Sixth	=< 10,000	< 15,000 SMLMV

Source: Law 617 of 2000.

### Appendix 2. Calculation of Municipal GDP

The effective rate of the industry and commerce tax (ICA) was computed as the ratio of ICA tax collection extracted from the Municipal Budget Execution and the ICA tax base, calculated as explained below. According to the legislation, the tax base for the ICA is the average monthly gross revenue of the taxpayer (business, shop, factories, etc...). As a proxy of the tax base, we use an estimation of the municipal GDP obtained as follows: based on the departmental GDP by economic activity, we calculated the municipal GDP of services and manufacturing, utilizing municipal information on service and manufacturing establishments extracted from the 2005 Census with these formulas:

$$GDP_{it(service)} = GDP_{service_{tD}} * \frac{establishment_{ti(service)}}{establishment_{tD(service)}}$$

$$GDP_{it(industry)} = GDP_{industry_{tD}} * \frac{establishment_{ti(industry)}}{establishment_{tD(industry)}}$$

where the sub-index  $D$  represents the department.

Agricultural GDP is obtained based on the information on cultivated hectares by municipalities reported by the Ministry of Agriculture with this formula:

$$GDP_{it(agricultural)} = GDP_{agricultural_{tD}} * \frac{Harvested\ area_{ti}}{Harvested\ area_{tD}}$$

Thus, the total GDP of municipality  $i$  in time  $t$  can be expressed as:

$$GDP_{it(total)} = GDP_{it(services)} + GDP_{it(industry)} + GDP_{it(agricultural)}$$

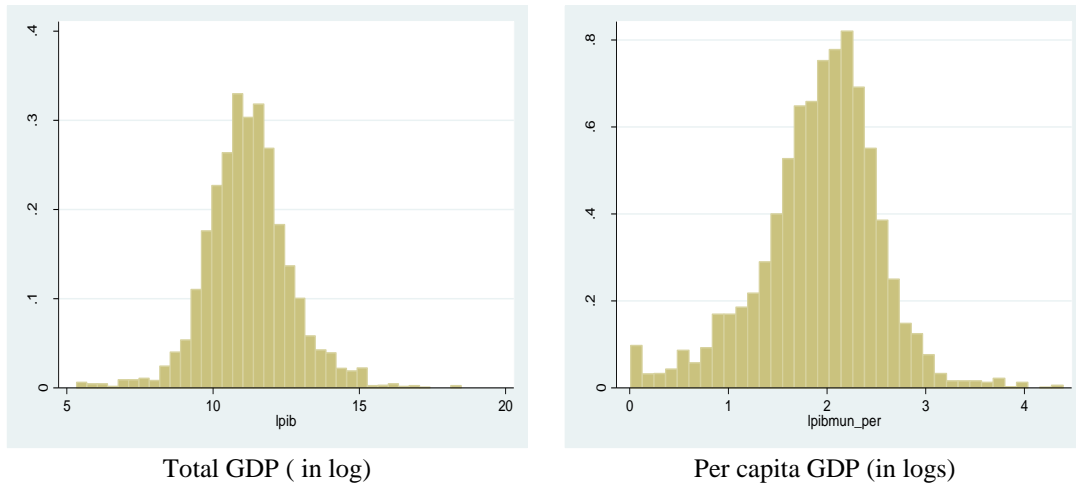
where the variable  $GDP_{it(services)}$  is the municipal GDP in the service sector,  $GDP_{it(industry)}$  is the municipal GDP in the manufacturing sector,  $GDP_{it(agricultural)}$  is the municipal GDP in the agricultural sector, and  $GDP_{it(total)}$  is total GDP. Finally, the subscript  $D$  indicates that the variable is departmental.

Therefore the effective industry and commerce tax will be:

$$Effective\ Rate\ Industry\ and\ Trade_{it} = \frac{Industry\ and\ Commerce\ Tax\ Revenues_{it}}{GDP_{it(total)}}$$

Figure 22 shows the distribution of GDP (in logs and the per capita GDP (in log) computed with methodology described above.

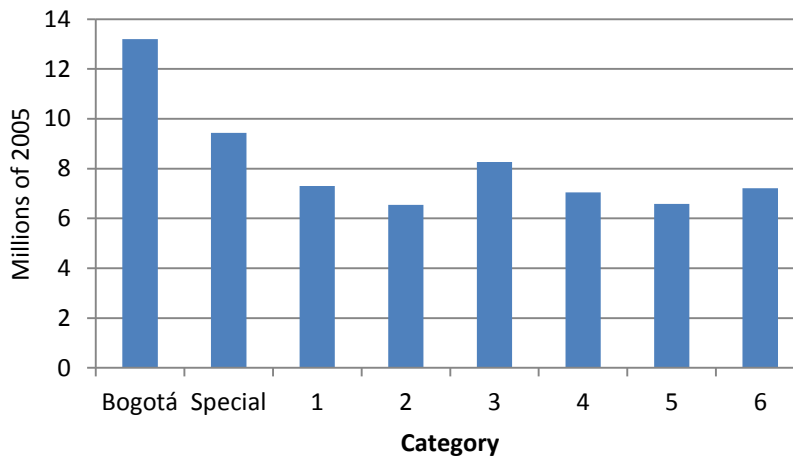
**Figure 21. GDP Distribution**



*Source:* Authors' calculations based on DANE data.

Figure 22 depicts per capita GDP by category of municipality. As expected, the calculated GDP is higher for Bogota and for the Special category and is more or less similar for the rest of the categories.

**Figure 22. Per capita GDP by Municipal Categories (Millions of 2005)**



*Source:* Authors' calculations based on DANE data.

### Appendix 3. What Is the Stochastic Frontier Analysis?

To explore the different elements that affect the revenue-collecting efficiency of Colombian municipalities, a stochastic frontier technique is used. Stochastic frontier models have been developed to uncover technical inefficiencies in the production of a particular output (Battese & Coelli, 1995). In this paper, the stochastic frontier technique is used to analyze inefficiencies in the collection of the two taxes (the PLT and the ICA) that are the main sources of own revenues for Colombian municipalities.

According to Coelli (1995), Battese and Coelli (1995), Aigner, Lovell, and Schmidt (1976), and others, stochastic frontier models are based on an OLS function of the type:

$$Y_{it} = \exp(X_{it}\beta + V_{it} - U_{it})$$

in which two types of errors are assumed to be present:  $V_{it}$  and  $U_{it}$ .  $V_{it}$  represents the random disturbance, independently and identically distributed as  $(0, \sigma_v^2)$ , and  $U_{it}$  is the non-positive disturbance, independently distributed of  $V_{it}$  and defined as:

$$U_{it} = U_i \exp(\eta(t - T))^{20}$$

Intuitively, the stochastic frontier technique allows the factors responsible for the difference between a municipality's actual and potential revenue collection (which is related to the tax base) to be separated into two categories: random ones (the  $V_{it}$ , related to exogenous factors or omitted variables) that are beyond the authorities' control; and the  $U_{it}$  which represents technical inefficiencies and/or policy decisions (regarding, for example, incentives or exemptions) that reduce collections. The ratio

$$\frac{Y_{it}}{[f(X_{it}; \beta) + V_{it}]}$$

represents the effort/efficiency of municipality  $i$  in collecting the tax in question.

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<sup>20</sup> The  $U$  errors are assumed to be iid as truncations at zero of the  $N(\mu, \sigma_u^2)$  (Battese and Coelli, 1992 quoted in Coelli, 1996). The  $\sigma_u^2$  and  $\sigma_v^2$  are replaced by  $\sigma^2 = \sigma_v^2 + \sigma_u^2$  and  $\gamma = \frac{\sigma_u^2}{\sigma_v^2 + \sigma_u^2}$  to the maximum likelihood estimations. And,  $t=1 \dots T$ .