NON-TAX REVENUE AND SUBNATIONAL DEMOCRACY:

EVIDENCE FROM COLOMBIA

by

LUKAS KONSTANTIN KELLER

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ABSTRACT OF THE THESIS

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Thesis Director:

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An influential group of political economists posits a negative relationship between the relative size of non-tax revenues in public balance sheets and the level of democracy in a given county. While empirical evidence for this proposition is largely based on cross-national studies, scholars have largely neglected subnational contexts as important domains of research. Addressing this disjuncture, the author studies the electoral impact of two important subnational non-tax revenues - natural resource royalties and central-government fiscal transfers - at the municipal level in Colombia. Employing a propensity score matching approach to attenuate problems of omitted variable bias, a quantitative analysis of Colombia's 1119 municipalities shows that higher levels of fiscal transfers and petroleum royalties had no discernible impact on the average level of competitiveness in the 2007 and 2011 municipal elections. If anything, there seems to be a positive impact of non-tax revenues on electoral contestation. Supported by

qualitative evidence from theoretical outliers in the set of observations, the results suggest that non-tax revenue promotes electoral competition by raising the stakes of attaining political office. At the same time, abundance in fiscal transfers and resource royalties may undermine democratic governance through means that are not reflected in electoral margins.

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1. Introduction

A substantial body of literature has evolved around the idea that higher levels of resource dependence affect the quality of democratic governance in many of the world's developing countries. Based on the various propositions about a potential link between resources and authoritarianism, more recent contributions to the debate have looked at the political effects of "non-tax revenue" (Morrison 2009) as a more general functional category. The proposed mechanisms by which resource dependence impinges upon the quality of democratic institutions, scholars ague, exists not only for resources, but for a whole class of rent-producing sources of income.

While the relationship between aggregate measures of non-tax revenue and democratic quality has been tested in various cross-national studies, few attempts have been made to explore the phenomenon in a within-country setting. Moreover, although Morrison and others have been identifying a number of previously understudied sources of non-tax revenue, they have been rather negligent of an economic resource that can have important implications for democratic governance particularly at the subnational level: central government fiscal transfers.

In this thesis, I want to bridge these two research gaps by studying the impact of two important subnational non-tax revenues - resource income and central-government fiscal transfers - on the quality of democracy at the municipal level in Colombia. Colombia represents an influential test case for a study of the political effects of non-tax revenues. On the one hand, the country has recently become one of the most fiscally decentralized countries in the region, which has increased the dependence of municipal governments on central government fiscal transfers greatly. On the other hand, major discoveries of oil and other natural resources since the 1980s have helped Colombia to benefit strongly from the global spike in raw commodity prices during the past decade. As a result, resource royalties have become an important source of income for a growing number of the country's municipalities.

While these aggregate developments highlight the leverage of the Colombian case, reports from individual municipalities that have grown highly dependent on fiscal transfers and natural resource royalties suggest that non-tax revenues could indeed have significant distortionary effects on local politics. For example, in the municipality of Aguazul, where 70% of the public budget are derived from oil income, government officials have frequently been accused of embezzlement of public funds, and accounts of targeted political violence are widespread.

In order to gauge an overall effect of non-tax revenues on political outcomes then, I set out to assess the impact of natural resource and transfer income on the competitiveness of the 2007 and 2011 Colombian municipal elections. Methodologically, I addressed problems of omitted variable bias through the use of a propensity score matching technique, that helped to approach the best possible circumstances for a causal effect analysis of fiscal transfers and natural resources on electoral contestation.

Using data on fiscal transfers, natural resources, electoral outcomes as well as economic and social conditions of all of Colombia's 1119 municipalities in the time period between 2000 and 2011, I show that higher levels of fiscal transfers and petroleum royalties seem to have no discernible impact on the competitiveness of local elections in Colombia. In fact, if anything, there seems to be a positive relationship between higher levels of non-tax revenues and electoral contestation. Supported by qualitative evidence from theoretical outliers in the set of observations, the results suggest that non-tax revenue promotes electoral competition by raising the stakes of attaining political office. At the same time, abundance in fiscal transfers and resource royalties may undermine democratic governance through means that are not reflected in electoral margins.

The thesis is structured as follows. In the next section, I review the theoretical and empirical debate about the relationship between non-tax revenue and (subnational) democracy. Subsequently, I examine the state of fiscal decentralization and natural resource production in Colombia, paying particular attention to the rules governing the flow of fiscal transfers and resource royalties across and within Colombia's territorial units. Based on these insights, section 4 discusses the data and method employed to empirically assess the effect of non-tax revenues on subnational democracy in Colombia. Section 5 consists of a detailed presentation and discussion of the results, which is followed by a conclusion.

2. Non-Tax Revenue and Subnational Democracy - Theoretical Perspectives

This section surveys a series of relevant theoretical propositions about the relationship between non-tax revenue and subnational democracy. I will start by providing a brief overview of recent developments in the *rentier state* literature, which has been instrumental in theorizing the links between the nature of a state's revenues and political outcomes. Afterwards, I will discuss the purported effects of non-tax revenues on subnational democracy in greater detail. Theoretical assumptions are laid out following a two-stage process: First, I examine relevant key characteristics of fiscal rents and highlight their implications for public finances and tax policy. Secondly, I explore the mechanisms that link the financial and tax policy effects of fiscal rents to authoritarian governance.

2.1 Recent Innovations in the Rentier State Literature

Ever since Hossein Mahdavy popularized the notion of the *rentier state* in 1970, the idea that the origin of government revenues could predict political outcomes has attracted considerable attention in academia and punditry alike. Two developments in the recent rentier state literature assume particular importance in the context of this study. First, while earlier studies of the kind of Mahdavy (Mahdavy 1970) and later Ross (Ross 2001) had been studying the relationship between a single source of rents and democracy, there has recently been a move towards considering the properties and effects of "non-tax revenue" and "fiscal rents" as more general functional categories. Secondly, while large-N studies had dominated the debate on the rentier state in much of the 2000s, they are increasingly complemented by more focused within-country studies. In the following, these two recent developments in the debate on the rentier state shall be explored in detail.

While the workings of the *rentier effect* are examined in greater detail in sections 2.2 and 2.3, it is important to note here that in the standard variant of the theory, rents reduce the prospect of democracy through their effects on accountability links between leaders and the citizenry. In particular, when governments have discretion over the distribution of revenues that are largely independent from broad domestic taxation, they lower its need to tax the populace which, in turn, suppresses citizen demands for accountability of and representation by the government (el-Beblawi and Luciani 1987; Mehdavy 1970; Ross 2001). As a result, rulers disengage from the public and instead of vying for mass programmatic appeal, tend to seek political support by cultivating personalistic patronage networks.

While this common account of the rentier effect has for long been closely associated with the rather well-known resource curse hypothesis[1] scholars in the past decade recognized the travel potential of the concept to other sources of income. For example,

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[1] For landmark studies on the resource course hypothesis see Aslaksen (2010); Dunning (2008); el-Beblawi and Luciani (1987); Haber and Menaldo (2011); Herb (2005); Jensen and Wantchekon (2004); Kurtz and Brooks (2011); Mahdavy (1970); Morrison (2009); Ross (2001). It should also be noted that the resource curse hypothesis makes two claims. One refers to political outcomes induced through resource wealth, the other to the impact of resource windfalls on economic output (often investigated in relation to the so-called "Dutch disease").

Bräutigam and Knack (2004), Moore (1998), and Smith (2008) found that in some contexts foreign aid may actually constitute a rent for rulers and thereby bolster authoritarianism. Along similar lines, analysts have pointed to non-tradable strategic assets such as transportation rights (passage fees) or military services (bases, camps etc. - Gervasoni 2009: 10) as important sources of rent. In a seminal study, Morrison (2009) then conceptually integrated these studies on various individual sources of rents by making explicit what scholars had obviously been touching on for years: "[I]f it is revenue doing the work, why is oil revenue different from other kinds of revenue, particularly others that are also "externally obtained"?" (Morrison 2009: 108). In his study, Morrison treats oil and aid revenues as a single functional category of revenues, so called "non-tax revenues", and finds that their political effects are indeed similar. The relative size of both revenues in national balance sheets is positively correlated with regime stability in democratic and authoritarian polities.

Importantly for the purpose of this thesis, conceptual advances in the study of rentierism have also been accompanied by the exploration of new domains of empirical research. In particular, the dominance of large-N cross-country has been fading as researchers have started to exploit the richness of subnational data on political regimes and non-tax revenue. For example, Goldberg et al. (2008) study the resource curse hypothesis in the context of the 50 United States and show that natural resource dependence contributes to, inter alia, less competitive politics. As Goldberg et al. note, country-specific data presents obvious advantages over conventional cross country panels. While the traditional cross-national datasets grappled with problems of fixed effects and idiosyncratic factors, data on subnational settings draws on such benefits as a single cultural environment and uniform rules of data collection. Causal inferences, as a result, become much more robust.

Among the scholars who look at subnational data to examine the relationship between non-tax revenue and authoritarianism, Gervasoni (2010) stands out for his use of a non-tax revenue that assumes importance particularly in within-country research. Gervasoni studies the effects of the relative size of central government fiscal transfers on the democratic performance of Argentine provinces. For subnational regimes, Gervasoni argues, fiscal transfers may create rentier effects of the same quality as natural resources and aid receipts at the national level. They are thus to be placed in the same category of non-tax revenues in that they create what Gervasoni calls “fiscal rents”. Tracing transfer receipts and political outcomes of all Argentine provinces over the period of three electoral cycles, Gervasoni finds that relatively more resource dependent provinces in Argentina are more likely to sustain less democratic regimes.

In sum, recent contributions to the literature on rentierism have provided for a series of conceptual and empirical innovations in the field. While Morrison (2008), by introducing the notion of non-tax revenues, has helped to integrate studies of various kinds of fiscal rent-producing government income, scholars such Goldberg et al. (2008) and Gervasoni (2009, 2010) have made considerable advances in highlighting variables and contexts that yield important additional insights on the alleged relationship between rentierism and a regime's democratic performance. However, the empirical record on non-tax revenues and subnational democracy is still rather scant, which makes the results of this thesis a particularly valuable.

In the following I discuss the purported effects of non-tax revenues on subnational democracy in greater detail. I will start by examining the relevant key characteristics of fiscal rents and highlight their implications for public finances and tax policy. Afterwards, I explore the mechanisms that link the financial and tax policy effects of fiscal rents to authoritarian governance.

2.2 Fiscal Rents and Public Finances

Despite the fact that rents, rent-seeking and the rentier state have become important matters in comparative politics over the past decades, a great degree of theoretical contestation and vagueness still exists with regard to the basic definitional traits of these concepts. In this thesis, I will conceive of rents as "income accruing to a state from an external source, for any reason, that involves little or no production cost for the recipient sate, and that implies the cooperation of a very small proportion of the state's population" (Gervasoni 2009: 5). The use of this definition is helpful because it maintains the key characteristics of a rent as stipulated in both classical as well as more recent studies of the concept[2], while also accounting for the fact that rents - as

[2] For a detailed overview of different definitions and conceptualizations of rents, see Gervasoni (2009: 2-10) and Dunning (2008: 39-40)

Morrison already demonstrated - may be derived from sources other than merely natural resources, such as leases, foreign aid and fiscal transfers. Following Gervasoni (2009), I will refer to rents in this most abstract form as “fiscal rents”, where “fiscal” refers to the fact that revenue accrues to the state directly, and “rents” to the fact that governments earn it without incurring great costs.

A consideration of the two sources of fiscal rents considered in this thesis help to illustrate these points. With regard to natural resource extraction, states usually face little difficulty in taxing the corresponding economic sector, since the heavy sunk costs involved in the exploitation of many natural resources create a relatively inelastic revenue base that provides the state with various opportunities for appropriating rent (Dunning 2008: 40). Secondly, the extraction of natural resources often takes place within the context of a geographically concentrated export-oriented industry, which leaves the natural resource sector largely disconnected from other productive processes (Hirschman 1977). It also precludes the wider workforce from having substantial direct labor stake in the production of natural resources. Third and finally, there is often a strict separation of labor between the state who acts the agent and a private producer or state company, where the former concentrates exclusively on the collection of rents (Dunning 2008: 40).

Meanwhile, fiscal federalism creates revenue flows that are in their entirety destined for state coffers. Most commonly, constitutional provisions allow taxes collected at the national level to be imbursed to subnational entities through a specific intergovernmental revenue sharing scheme. The relative amount of fiscal transfers that each subnational unit receives typically depends on some measure of objective material need and in some cases, specific idiosyncratic provisions secured by an entity vis-à-vis the central government. The extent to which transfer revenue flows are obtained "cheaply" or "without the involvement of a large proportion of the population" will therefore vary within a federation, depending on the amount of fiscal transfers received by a given subnational unit relative to the amount of tax money paid into the system.

As this discussion already suggests, the process through which fiscal rents affect the wider political economy of the state relates to their impact on public revenue generation and spending. As numerous scholars have noted, the low aggregate costs involved in generating revenue from sources such as fiscal federalism or natural resource extraction often induces governments to lessen their efforts to obtain more difficult-to-collect forms of revenue such as income taxation (Dunning 2008). After all, taxation requires the set up of expensive enforcement and monitoring capabilities, may divert production to non-taxable activity or promote capital flight. In this sense, greater amounts of fiscal rents decrease the marginal readiness of a state to incur the higher aggregate costs of tributary activities. As Dunning puts it (2009: 51): "[…] although states may be relatively more willing to pay the aggregate distortionary costs of taxation in the absence of resource rents, a resource boom may contribute to a shift of the peak of the well-known Laffer curve, in which total tax revenues are said to initially increase with the tax rate but eventually decline."

The negative relationship between fiscal rents and taxation has been demonstrated empirically for a great variety of contexts and, as section three will reveal, is also pronounced in the case of Colombian municipalities. In one exemplary empirical account, Chaudhry (1997) describes how the oil boom in Saudi Arabia in the 1970s led to the immediate dismantlement of the extractive bureaucracy, which precipitated, inter alia, tax breaks for Saudi citizens and foreign residents, the abolishment of fees on imported goods, as well as a shift towards a government-funded social insurance program. Analysts that have looked at other historical and cultural contexts include Soifer (2006), who provides empirical evidence on the negative relationship between resource windfalls and taxation in nineteenth- and twentieth-century Peru and Chile and Mommer (2002), who studies the phenomenon for 20th century Alaska, thereby showing that the highlighted rent-tax relationship does not only exist for developing countries.

In sum, fiscal rents constitute revenue that accrues directly to the state and that is relatively cheap for governments to generate. These key traits account for the fact that fiscal rents influence the rest of the political economy of the state mainly through their impact on public revenue generation and spending. In particular, it is the tax base and other forms of extracting revenue from citizens that tend to be displaced in the face of growing streams of government transfers, natural resource royalties and the like. Having explored the key characteristics of fiscal rents as well as their impact on public revenue structures, I will now turn to examining the link between governmental finance and political outcomes.

2.3 Fiscal Rents and Authoritarian Politics

The idea that the nature, origin, and size of a state's revenues are key in explaining political outcomes is not exclusive to the rentier state literature, but has also been proposed in more general landmark works of political economy such as Brennan and Buchanan (1980), Musgrave (1959) and Schumpeter (1991). The shared proposition about the link between public revenue and political regimes put forth in these studies emphasizes the importance of taxation as the basis of a "representative bargain" (Ross 2001: 332) within societies. Where rulers are required to raise revenue from the labor of their subject populations, the latter will demand representation in governmental affairs. Moreover, rulers are forced to put in place institutions that credibly limit their own power to renege on implicit repayment commitments (Dunning 2008).

Building on this body of literature which sees the emergence of representative government critically conditioned by regimes of public finance, many scholars of both the classical as well as the more recent rentier state literature argue that non-tax revenue flows severely undermine the tax-accountability link between citizens and the government (el-Beblawi and Luciani 1987; Gervasoni 2009; Goldberg et al. 2008; Jensen and Wantchekon 2004; Mahdavy 1970; Morrison 2009; Ross 2001). Where rulers command important sources of income that are independent of broad domestic taxation, citizens are believed to lose both the incentives and power to demand a share of political authority. In other words, the negative relationship between fiscal rents and taxation highlighted in the previous section is the primary source of authoritarian government in rentier states.

It is important to note that proponents of this argument are often making two somewhat different, yet interrelated claims about the relationship between non-tax revenues and democratic politics. The first of these refers to a process by which non-tax revenue dependence precedes the adoption of representative institutions, thereby hindering the *emergence* of democracy in a given society. The second, on the other hand, applies to contexts where the dependence on natural resource royalties, fiscal transfers and other external revenues increases *after* a process of democratization was set in motion. In this latter case, which one may call the "windfall" version of the argument, the weakening of the tax-accountability link should be understood not so much as a direct cause of authoritarian government, but rather as a process that further enables the erosion of democratic institutions. Thus, besides considering the extent to which increased non-tax revenue flows undermine citizen demands for representation in government, this second view of the political effects of rentierism also emphasizes the actual instruments that rulers acquire through increased amounts of fiscal rents and that allow them to alter the political landscape as they see fit.

According to the "windfall" argument about the political effect of fiscal rents then, abundant and easily obtained non-tax revenues provide leaders with the financial instruments to ensure that they remain in power (Morrison 2009; Ross 2001 333-4; Goldberg et al. 2008). Given a certain level of discretion over the spending of rents, a governing elite may use its privileged fiscal position to invest in technologies with which to ward off challenges to its rule. This may allow them to co-opt political opposition with material inducements, or to stifle dissent through repressive means. In this sense, fiscal rents provide rulers with means for both positive and negative selective inducements, which enable them to stay in power despite otherwise unfavorable conditions (Goldberg et al. 2008).

Moreover, in situations where non-tax revenues are large relative to the size of the domestic economy, the state may become by far the most important employer and source of wealth (Gervasoni 2010: 307). Again, provided that incumbents can spend rents discretionally, they may use this position to pay high salaries to public employees, monopolize the electoral advertising market and cultivate personalistic patronage networks. All of this decreases the incentives for social actors to oppose the regime (Gervasoni 2010; McMann 2006). As Gervasoni (2010: 308) puts it: "When the state controls most attractive jobs and other economic opportunities, individuals tend to acquiesce, while careerist activists and politicians join the incumbent party."

Together, these dynamics account for the fact that rentier states approach the "least favorable circumstances" for competitive politics, where "violence and socio-economic sanctions are exclusively available to the government and denied to the opposition" (Dahl 1972, cit. in Gervasoni 2010: 307). This finding may have particular resonance in the context of small territorial units like municipalities, where repression and control can be much more easily exerted due to the intimacy of the social environment, the absence of professional media outlets especially in rural areas, and the perception of local politics as business of secondary importance.

In sum, theory suggests that non-tax revenues may have the potential to severely undermine the "representative bargain" between citizens and the government by providing rulers with sources that are independent of broad domestic taxation. Moreover, given a certain level of discretion over the spending of rents, a governing elite may use its privileged fiscal position to co-opt political opposition with material inducements, or to stifle dissent through repressive means. Under such circumstances, elites may skew the political playing field in their favor, which is particularly likely in subnational electoral settings.

3. Fiscal Rents and Subnational Democracy in Colombia

Given these theoretical assumptions about the impact of fiscal rents on the quality of democracy at the subnational level generally, what would one hypothesize as to the political effects of fiscal rents at the municipal level in Colombia? To answer this question, this section surveys the framework governing the distribution of natural resource and fiscal federalism rents in Colombia and assesses the extent to which these two sources of rents have gained importance in municipal balance sheets over the past two decades. Against the backdrop of our theoretical framework, two subordinate questions will be of particular interest: What is the level of discretion municipal governments have in the distribution of fiscal rents in Colombia? And to what extent have rising levels of natural resource revenues and fiscal transfers been accompanied by an erosion of the tax base in Colombian municipalities?

3.1 Natural Resource Production and Royalties

While Colombia has had some level of natural resource production on its territory since the beginning of the 20th century, the importance of the mining and petroleum sector has increased significantly after several major mineral and oil discoveries throughout the 1980s (Perry and Olivera 2009). These discoveries have been concentrated in a few departments and municipalities, which also receive a majority share of royalties derived from exploitations. Specifically, the current constitution of 1991[3] stipulates that departments hosting oil and mineral exploitation enterprises receive between 47.5% and 52%[4] of oil and between 42% and 45% of carbon royalties. At the same time, municipalities receive between 12.5% and 32% of petrol and between 32% and 45% of carboniferous royalties generated within their jurisdictions. Moreover, municipalities that host ports used for the export of petrol or coal receive an additional 8% and 10% in royalties respectively. The remainder of royalties derived from resource exploitation - so-called "indirect royalties" - make up between 5% and 15% and are destined for a national fund, the *Fondo Nacional de Regalías*, which is used to finance regional public projects across the country (Departamento Nacional de Planeación 2013) .

With regard to the spending destinations of the direct royalties, Law 141 of 1994 and decree 1747 of 1995 earmark 90% of total royalty income for the fulfillment of a given entity's "development plan" (*proyectos prioritarios del plan de desarrollo*). Of these 90%, 60% or more must be used to reach pre-specified target levels of health care coverage, education, sanitation and child mortality[5]. As long as these targets are not met, the budget may not be used for other targets on the development plan. The

[3] It is interesting to note that prior to 1991, the distribution of resource royalties was not regulated as a matter of fiscal decentralization. Therefore, all resource royalties accrued to the central government before 1991 (Rojas & Forero 2011).

[4] The exact eventual percentage depends on the actual amount of production (Departamento Nacional de Planeación 2013).

[5] The respective target levels set by national ministries are 1% infant mortality, 100% health care coverage, 90% primary education enrollment and 70% coverage in adequate sanitation (Departamento Nacional de Planeación 2013).

remaining 10% of royalties are destined for subnational investments in technical inventory capacities (5%) and to cover operational costs (5%).

Since its inception in the early and mid 1990s, the framework governing the distribution and spending of resource royalties has been the subject of mounting public criticism. Most importantly, there is discontent about the growing regional imbalances that the framework has caused to build up. However, despite a series of reforms aimed at modifying quotas in the distribution of royalties, and efforts to place additional constraints on the spending activities of municipalities and departments, the basic structural traits of the system have remained intact (Perry et al. 2010).

The regional imbalances brought about by the spatial concentration of royalties are palpable. 95% of all resource exploitation enterprises have been concentrated in fewer than a 100 out of the total 1119 Colombian municipalities (Rojas and Forero 2011). The departments of Casanare, Arauca and Meta alone have received 46% of all resource royalties between 1995 and 2009. Ironically, these departments are among the least populated in the country and overall, 80% of all resource royalties have been benefiting only 17% of Colombia's population over the above time period (ibid.).

Moreover, despite the fact that various specialized government agencies have been tasked with overseeing the spending activities of the departments and municipalities as stipulated by Law 141 of 1994 and decree 1747 of 1995, studies demonstrate that entities receiving substantial amounts of resource royalties are on average slower in making advances towards the fulfillment of the government targets highlighted earlier. According to Rojas & Forero (2011), royalty dependence of regional and local governments can directly account for this lack of progress. After all, municipalities and departments that are among the largest recipients of royalties are marked by high degrees of fiscal inefficiency and waste (ibid.).

Exemplary cases in that respect are the municipalities of Puerto Gaitán and Aguazul. The government of Puerto Gaitan, a municipality of 17,000 inhabitants, derives 58% of its budget from resource (mainly oil) royalties, which has allowed it to increase public spending levels by 600% from 2004 to 2008. In Aguazul, on the other hand, 70% of the public budget come from resource royalties (ibid.). As such, the municipality has become an epitome of the resource boom in Colombia, and the fortunes it derives from its Cupiagua oil fields have drastically increased the stakes of attaining and controlling political in Aguazul. The municipality was a stronghold of the paramilitary forces during the heydays of the armed conflict in Colombia (2000-2003), and although one of the richest municipalities in Colombia thanks to the recent surge in royalties, was among the most violent at the beginning of the past decade. In a 2007 article by Semana, the mayor himself is suspected to have links to local paramilitary bosses. In this setting, corruption and clientlism have been widespread, and the municipality has repeatedly made national headlines for grotesque incidences of embezzlement of public monies (Semana 2007).

In the face of such examples and the overall extent to which the framework governing the distribution of royalties in Colombia favors individual resource producing and exporting entities, there is plenty of reason to hypothesize that natural resource wealth has indeed promoted the development of subnational rentier states in Colombia. In the following, I set out to ascertain whether a similar conclusion can be reached regarding central government fiscal transfers.

3.2 Fiscal Transfers

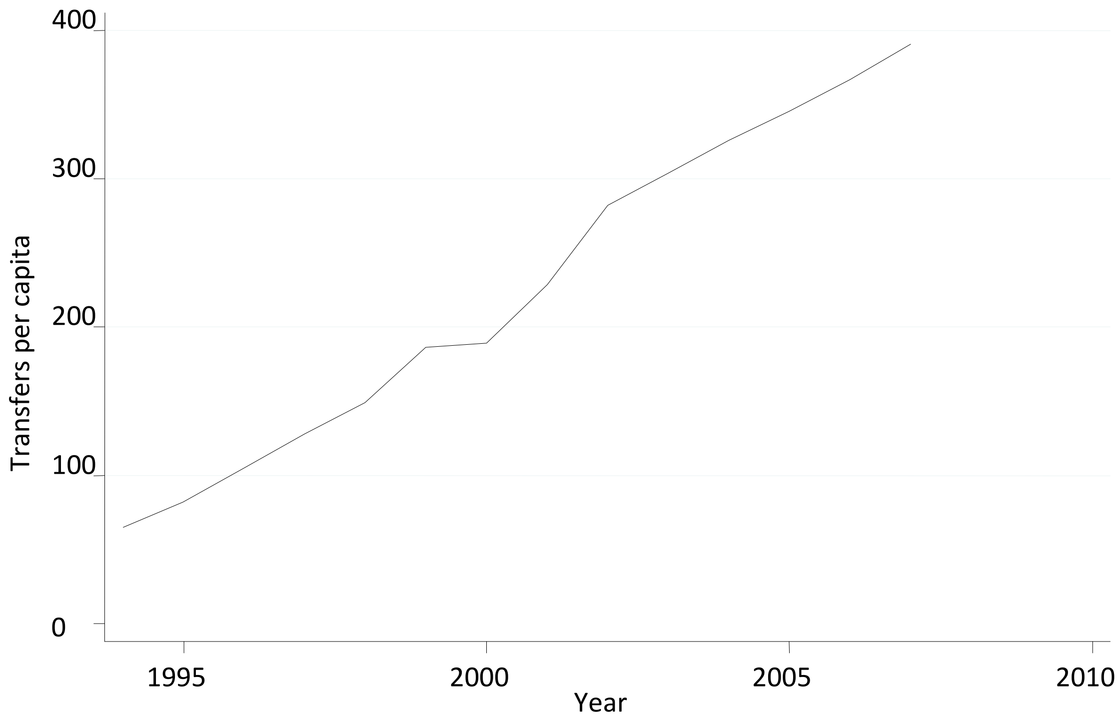
Colombia has made great strides towards fiscal decentralization over the past two and a half decades and fiscal transfers have become an increasingly important source of income for Colombian municipalities over this period of time. The country's current system of fiscal federalism was decisively shaped during the national reform packages of the early 1990s, when the constitution of 1991 and Law 60 of 1993 created two separate categories of transfers: the *situado fiscal,* meant for the departments to pay for health and education, and the *participaciones municipales*, more generalized transfers destined for the municipalities (Bird 2012).

The legislative provisions of Law 60 significantly expanded the amount of revenues assigned to departments and municipalities by broadening the base of the existing revenue-sharing system to include all recurrent revenues of the government (World Bank 2009). Overall, the constitution and Law 60 mandated the central government to sharing at least half of its current revenues with departmental and municipal governments by 2002 - a doubling in real terms compared to 1993 levels (Bird 2012). To illustrate what this meant for the municipalities, their share in total government expenditures increased from 14 percent in 1993 to 22 percent in 2002 (World Bank 2009).

In 2001, after years of dramatic increases in subnational public sector spending that were caused by the new revenue sharing system, the Colombian government passed a constitutional amendment (the *Acto Legislativo*) that was intended to set limits to the escalating growth of transfers (ibid.). The reform package also included measures to decrease subnational discretion in transfer spending by setting up rules for earmarking. Despite these measures however, the level of fiscal decentralization has remained high and continued to increase almost unaltered (see illustration 3.1). As Daugthers and Harper (2007) note, measured in conventional terms (assessing the share of subnational expenditures in total public expenditures) within less than a decade Colombia became one most fiscally decentralized country in the region (with only Brazil and Argentina being more decentralized).

Moreover, even though the *Acto Legislativo* provided for controls on the way departments and municipalities spend the fiscal transfers accruing to their state coffers, the failure to build up capacities at the local level to manage a heavily decentralized system has maintained ample opportunities particularly for municipal authorities to funnel funds for private use (Bird 2012). According to Bird (2012), pundits have repeatedly expressed concern over local politicians in the past years who engaged in such activities as placing friends, relatives, and supporters on the public payroll and spending transfer monies in other undesired ways.

Illustration 3.1 - Average fiscal transfers per capita 1994-2007



Data: Departamento Nacional de Planeación 2013; Perry and Olivera 2009

* in thousands of current Colombian Pesos (COP))
1$ = 2200 COP (2008)

With regard to the suspected negative relationship between fiscal federalism rents and direct taxation, data from the World Bank shows that while Colombia has tripled the importance of subnational spending from 1986 to 2005, the relative importance of subnational taxes has in fact decreased over this time period (World Bank 2009). At no point have subnational governments obtained any significant new access to "own" tax sources. In table 3.1 I use data on oil production and export sites, fiscal transfers and the amount of personal income taxation collected by Colombia's municipalities to demonstrate the relationship between growing amounts of fiscal rents and direct tax levels in Colombia. Controlling for GDP per capita (proxied by commercial and industry taxes per capita) the direction and significance levels (all $p \leq 0.01$) of the regression coefficients confirm the intuition from the theory: Higher levels of fiscal transfers and the presence of natural resource sites are negatively correlated with a given municipality's tax effort.

Table 3.1 - Association between fiscal transfers, oil royalties and personal income tax base: OLS regression

Variable	**Coefficients**
Dependent variable	
Personal income tax as a share of total municipal government income	
*Independent variables**	
Fiscal Transfer Dependence	- 0.202 (0.008) ***
Natural Resource Royalties	- 0.042 (0.003) ***
*Control variable**	
GDP per capita (proxy)	- 0.276 (0.063) ***

Note: Reported above are OLS unstandardized beta coefficients with standard errors in parentheses and significance levels. *p ≤ 0.10, **p ≤ 0.05, ***p ≤ 0.001. N = 1001

* For operationalizations of these variables see section 4.

In sum, fiscal transfers have become a significant source of income for subnational regimes in Colombia over the past two and a half decades. Moreover, attempts in the early 2000s at curbing the discretion in spending of fiscal transfers have been insufficient at best, providing politicians at the municipal level with ample opportunities for the promotion of patronage networks. Together with the finding that increased reliance on fiscal federalism - as well as the presence of natural resource production and export sites - had indeed led to an erosion of the tax base, leads us to confidently hypothesize a negative relationship between non-tax revenues and subnational democracy in Colombia.

4. Data & Method

In this section I discuss the data and research design of the empirical analysis of the impact of fiscal federalism and natural resource rents on democratic quality at the subnational level in Colombia. I will begin by reporting the operationalization and nature of the main dependent, independent and control variables of the statistical model and subsequently highlight the strategy for estimating the effect of fiscal federalism and natural resource rents.

4.1 Data

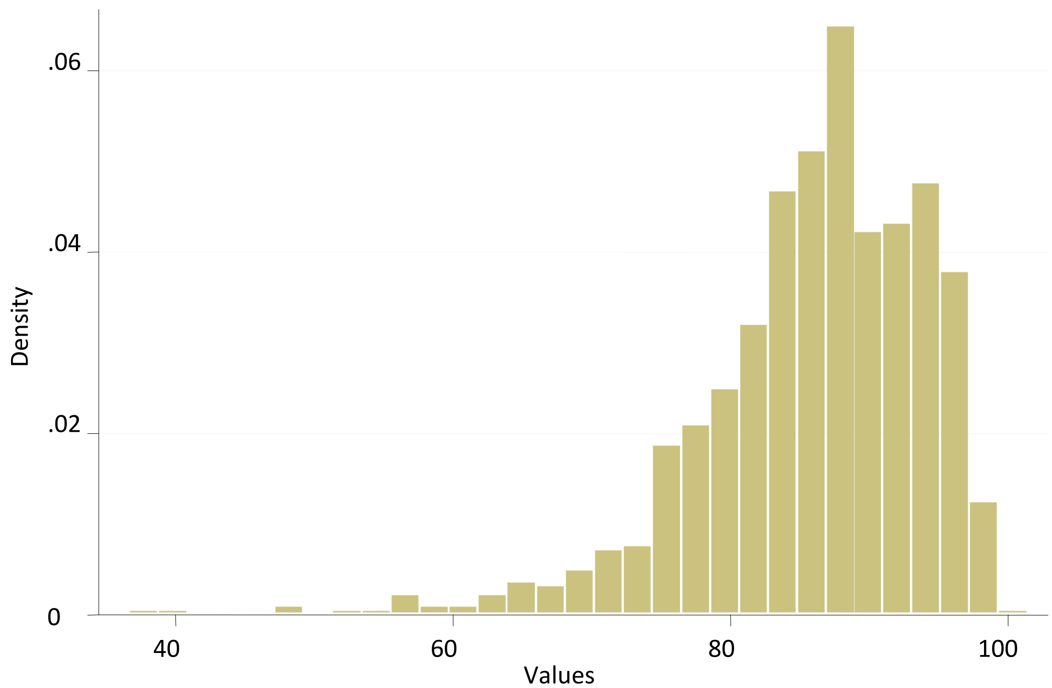
The sample includes observations from all 1119 Colombian municipalities. The data for the predictor variables are averages for the period of 2000 to 2007. Averaging over this time frame appears worthwhile given the fact that the period captures representative levels of fiscal transfers in Colombia and includes data for the worldwide boom in commodity prices. We therefore increase the likelihood of detecting an effect of fiscal federalism and natural resource rents on electoral politics.

4.1.1 Measuring Democratic Quality

Given the difficult data collection problems involving a quantitative analysis of Colombian municipalities, I am forced to limit myself in the construction of the dependent variable to one core dimension of democratic quality: The level of electoral contestation, measured in terms of the difference in vote shares between the winner and the runner-up in each municipal election. It certainly would have been desirable to increase the breadth of this variable by including, for example, measures of political freedoms and civil liberties, as well information on candidate party identification to account for turnover dynamics. However, while the former is difficult given the small size and large number of municipalities in Colombia, an assessment of party identification faces the problem of an unstable party landscape and frequently changing candidate loyalties that are typical for subnational politics in the country. These factors made opting for electoral contestation as the unique indicator of democratic quality inevitable. Yet, I argue that the use of electoral contestation serves as an adequate proxy of democratic quality nevertheless. After all, it has been described as one of, if not *the* most important component of political democracy in various seminal works of the discipline (Dahl 1972; Huntington 1991; Schumpeter 1942).

At the data level, electoral contestation is operationalized by subtracting from 100 the difference in vote shares between the winner and the runner-up for each of the municipalities in the 2007 and 2011 mayoral elections and by subsequently averaging the individual results for each municipality. Illustration 4.1 summarizes this variable in a histogram. Of the 1075 municipalities for which there is data for both the 2007 and 2011 elections, some 376 (35%) municipalities are highly competitive, with average victories of less than 10% over the past two municipal elections. At the same time, 8% (90) of Colombian municipalities had average margins of victory in excess of 25%, implying very low levels of electoral contestation. In the data analysis below, I use the log of the variable, thus increasing the independence between the variation of intensity and absolute magnitude. Data on municipal electoral outcomes come from the Colombian *Registraduría Nacional del Estado Civil* (Registraduría Nacional del Estado Civil 2013).

Illustration 4.1 - Histogram of dependent variable *electoral contestation*



4.1.2 Measuring Fiscal Federalism and Natural Resource rents

The measure of fiscal federalism rents used in this thesis is the amount of fiscal transfers as a proportion of total municipal government income. This measure adequately captures governmental dependence on fiscal federalism rents and is thus to be preferred over alternative operationalizations that have been used or discussed in previous research such as transfers per capita or transfers over GDP (Gervasoni 2009; 2010). Data to assemble this measure come from the Colombian *Departamento Nacional de Planeación (2012)* as well as Perry and Olivera (2009).

Table 4.1 below shows that the overall level of fiscal transfer dependence over the time period of 2001 to 2007 has been .7 or 70% of total municipal income, with values deviating, on average, 16 percentage points away from the mean. These preliminary findings confirm what has been suggested in the previous section, namely that municipal governments in Colombia tend to be extremely dependent on fiscal transfers distributed by the central government.

Table 4.1 - Descriptives: Fiscal Transfers

Variable	**Mean**	**Std. Dev.**	**Min**	**Max**	**N**
Fiscal federalism rents	0.71	0.16	0.12	0.98	1098

Given that there exists no detailed data on production quantities for natural resource exploitation at the municipal level in Colombia, I draw on a dummy variable indicating the presence of major oil production sites or export harbors in a given municipality. I decided not to include dummies for the production of coal and other natural resources as main predictors of rents considering their minor relevance as sources of royalities in

Colombia[6] or their extremely concentrated nature of occurrence (emeralds). I do however control for their effects in the model. A descriptive analysis of the petroleum dummy variable - summarized in table 4.2 - shows that 136 of 1119 municipalities (12 %) possess either an oil production or maritime export site on their territory.

Table 4.2 - Frequencies: Petroleum rents

Value	**0**	**1**
Frequency	983	136
Percent	87.85	12.15

4.1.3 Control Variables

Control variables include population size, municipal GDP per capita, the degree of urbanization, judicial efficiency and judicial coverage, the number of NGOs in a municipality and indicators of a given municipality's exposure to the armed conflict in Colombia.

The inclusion of population is expedient since the size of a municipality could affect electoral competition. For example, one could argue that larger municipalities have capabilities to put additional scrutiny on the electoral process. Moreover, controlling for GDP/capita is necessary since electoral contestation may be significantly determined by

[6] In 2011, 74% of total royalty income in Colombia was derived from oil exploitations, compared to 23% from coal extraction. According to estimates of Rojas & Forero (2011) the ratio was 90%-10% earlier in the 2000s.

the level of development of municipalities. Due to a lack of corresponding data, municipal GDP per capita is proxied using industry and commercial taxes per capita for each municipality. Another variable that captures important developmental dynamics is the level of urbanization. Our measure for this indicator is the percentage of the total municipal population living in urban areas. Note that lower values on this variables indicate higher levels of urbanization.

Including judicial efficiency and judicial coverage as controls in the model is worthwhile since a well functioning judiciary may significantly deter electoral fraud and may thus independently affect municipal electoral contestation. In operational terms, judicial efficiency is an index provided by Perry & Olivera (2009) while coverage is measured as the number of judicial institutions per 1000 inhabitants.

The strength of civil society may be positively affecting electoral contestation since associations, human rights organizations and other related institutions will likely also act as watchdogs of the electoral process. Our indicator of civil society strength is the number of NGOs per 10,000 inhabitants.

Importantly, the frequency of acts of violence as well as the presence of major belligerent groups within the Colombian armed conflict should affect the electoral process of a municipality. A higher conflict intensity will likely produce less competitive politics at the local level. Conflict dynamics are captured through a variable counting the number of conflict related attacks per 100,000 inhabitants as well as through dummy variables indicating whether rightwing paramilitaries (under the banner of the *Autodefensas Unidas de Colombia* - AUC) or leftist guerilla groups (belonging either to the *Fuerzas Armadas Revolucionarios de Colombia* - FARC, or to the *Ejército de Liberación Nacional* - ELN) have been active in a municipality in a given year over the 2000-2007 period.

Last but not least, I control, as mentioned earlier, for the potential effects of other major non-petrol resources, namely coal and emeralds. Table 4.3 summarizes the descriptive statistics of the dependent, independent and control variables.

Table 4.3 - Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	N
Dependent Variable					
Electoral Contestation	86.18	8.31	36.75	99.54	1075
Independent Variables					
log(Fiscal federalism rents)	0.53	0.10	0.11	0.68	1098
Presence of oil / petrol harbor	0.12	0.33	0	1	1119
Control Variables					
log(population)	9.58	1.08	6.13	15.73	1116
log(GDP per capita) (proxy)	0.01	0.03	0.00002	0.33	1094
Index of urbanization	2.69	3.45	0.002	37.01	1061
Judicial efficiency	0.94	0.53	0	5.33	1092
Judicial coverage	1.39	1.16	0	8.80	1051
NGOs per 10,000 inhabitants	0.15	0.42	0	4.98	1092
Attacks per 100,000 inhabitants	11.42	15.88	0	153.16	1058
AUC present	0.21	0.25	0	1	1116
FARC present	0.41	0.36	0	1	1116
ELN present	0.18	0.28	0	1	1116
Carbon production	0.09	0.29	0	1	1119
Emerald production	0.13	0.02	0	1	1119

4.2 Estimation

In statistically estimating the effect of fiscal rents on electoral contestation, I follow a two-pronged approach. First, OLS regression is used to gauge an association between fiscal federalism and natural resource rents on the one hand and electoral competition on the other, while controlling for the impact of the variables reported above. Secondly, I will complement the multivariate OLS estimation with a generalized propensity score (GPS) matching approach that helps to reduce the confounding variance in the measured data by allowing for the comparison of municipalities that have similar values on relevant "pre-treatment" observables. The possibility to compare municipalities that differ in their level of electoral contestation, but are otherwise equal with regards to a series of specified covariates, alleviates the problem of omitted variable bias in that it discounts the influence of observations that have no particular grounds for being compared to another. Thereby, matching helps to ensure common support and, by weighing observations according to the extent to which they approximate a credible counterfactual, accounts for the fact that treatment effects may be different for certain types of municipalities (Zucco forthcoming 2013). Moreover, employing both regression and matching bolster the inferential strength of our results since the techniques reinforce and correct one another (Ho et al. 2007).

5. Results

5.1 OLS-Regression Results

The results of the multivariate regression are reported in table 5.1 and are presented as OLS regression coefficients. Positively signed coefficients indicate that the respective variable is associated with higher in electoral contestation in municipalities. Regressions were run based on two models: The first includes the two predictor variables fiscal federalism rents and natural resource rents as well as the three central covariates population, GDP per capita and the level of urbanization. The second model includes, in addition, all of the remaining control variables.

The results of the estimation of model 1 show that both of the main predictor variables are statistically significantly correlated with the level of contestation in municipal elections. However, the theoretical assumption that greater levels of dependence of municipal governments on fiscal federalism and resource rents are associated with lower levels of electoral contestation, is not confirmed. Instead, for both fiscal federalism rents as well as the petroleum sites dummy variable, the coefficient is rather large and positive. This result would suggest that municipalities that received greater relative amounts of fiscal transfers, and that possess petroleum production and export sites on their territory, have on average been blessed with higher mean levels of electoral contestation in 2007 and 2011.

Moreover, two control variables reach statistical significance in model 1. The index of urbanization is negatively correlated with electoral contestation. In other words, the expectation that rural municipalities have on average less competitive elections when compared with their more urban counterparts, is confirmed. The same holds true for population: All else equal, larger municipalities are more competitive than less populous ones.

Adding the remainder of the control variables in model 2 does not seem to attenuate the effect of fiscal federalism rents much, with the coefficient roughly stable (0.116 as compared to 0.124) at a significance level of $p \leq 0.05$. The effect of natural resource rents however ceases to be significant. Among the set of control variables, only the index of urbanization is a significant predictor of electoral contestation, with the direction of the relationship still negative as expected. None of the additional control variables in model 2 seem to have substantial explanatory power for the level of electoral contestation in municipalities. Moreover, there is surprisingly little change in the model fit when additionally considering the larger set of control variables.

Table 5.1 - Predicting electoral contestation by fiscal federalism and natural resource rents: OLS Regression

Variable	Model 1		Model 2	
Predictor Variables				
Fiscal Federalism Rents	10.107 (3.500) **	B = 0.124	9.435 (3.697) **	B = 0.116
Natural Resource Rents	1.812 (0.808) **	B = 0.072	1.346 (0.849)	B = 0.054
Control Variables				
Population	0.506 (0.267) *	B = 0.065	0.330 (0.351)	B = 0.042
GDP per capita (proxy)	7.678 (12.245)	B = 0.024	8.668 (12.40)	B = 0.028
Index of urbanization	- 0.152 (0.078) *	B = - 0.063	- 0.139 (0.081) *	B = - 0.058
Judicial efficiency			- 0.036 (0.518)	B = - 0.002
Judicial coverage			- 0.393 (0.260)	B = - 0.055
NGOs/10,000 inhabitants			- 0.107 (0.655)	B = - 0.005
Attacks/100,000 inhabitants			0.002 (0.021)	B = 0.004
AUC present			0.954 (1.326)	B = 0.030
FARC present			0.120 (0.892)	B = 0.005
ELN present			- 1.866 (1.076)	B = - 0.065
Carbon production			- 0.521 (0.882)	B = - 0.019
Emerald production			- 2.237 (1.998)	B = - 0.037
(Constant)	(75.996) ***		(78.750) ***	.
	R^2 = 0.02 F = 3.42 ** N = 1035		R^2 = 0.02 F = 1.67 * N = 1014	

Note: Reported above are OLS unstandardized beta coefficients with standard errors in parentheses as well as standardized beta coefficients (B) with significance levels. *p ≤ 0.10, **p ≤ 0.05, ***p ≤ 0.001.

5.2 Omitted Variable Bias and Causal Inference Problems

Before engaging in a thorough discussion of the results of our OLS regression analysis, and in the light of the rather surprising findings of the latter, one is advised to closely consider the substantial omitted variable bias and causal inference problems inherent in an empirical analysis of fiscal rents and subnational democracy in Colombia.

With regard to fiscal federalism rents, the main problem with a regression analysis of the set of Colombian municipalities is that this estimation approach does not account sufficiently for the non-randomness of transfer receipts in Colombia. It is likely that municipalities that receive higher levels of fiscal transfers differ from those municipalities that receive relatively fewer transfers not only in their level of transfer dependence but also in other characteristics that affect both the relative size of transfer receipts (the "treatment" in a more abstract sense) and electoral contestation (outcome). The non-randomness of treatment assignment thus introduces the likelihood that important unobserved variables confound our results substantially. More specifically, it could well be the case that the significant positive relationship between fiscal federalism rents and electoral competition, which goes against theoretical intuition, is actually driven by a third confounding variable that is neither conceptually, nor empirically accounted for in our analysis.

A somewhat different but related dynamic might be at play with regards to petroleum royalties. Since the occurrence of oil across the set of Colombian municipalities can be viewed as largely random, unobserved variables should exclusively affect the relationship between oil rents and electoral competition.

While the ideal strategy to overcome the problems of omitted variable bias and endogeneity inherent to the data would be to find an instrumental variable or to exploit the data in search of a quasi-natural experiment or major discontinuities, no such technique is possible given the information about fiscal federalism and natural resource rents at hand. Thus, as a second best approach to attenuate the effect of non-observables in our analysis I propose the use of generalized propensity score matching (PSM) as a method of data preprocessing. As mentioned earlier, GPS allows isolating a sub-sample of observations in which municipalities are compared to each other based on the similarity of "pre-treatment" conditions. Moreover, it allows weighing observations according to their propensity of receiving treatment and thus accounts for the fact that treatment effects may differ across levels of the predictor variable. Applied to our problem then, the effect of fiscal federalism and oil rents are assessed by comparing the level of electoral competition for cases that are highly similar on a set of specified variables but differ in the amount of rents received.

5.3 Pre-Processing and Weighted Regression Using Propensity Score Matching

It should be noted that the analytical purpose of PSM is different for the estimation of the effect of fiscal federalism rents on the one hand and of petroleum production and export sites on the other. As noted earlier, in the case of fiscal federalism rents, we may confound the effect of the latter on electoral competition by neglecting one or more unobserved variables that affect both treatment status *and* electoral competition. Thus, for fiscal federalism rents, the matching procedure is predicated on a prediction of the level of fiscal federalism rents for each municipality that is based on a series of factors mainly describing the objective "need" of a given municipality. The corresponding regression will provide a "propensity score" for each municipality, which indicates a given municipality's probability of receiving a certain level of transfers - our continuous "treatment" variable. Afterwards the matching procedure itself will focus on the variation in the level of fiscal transfers and electoral contestation for those municipalities that *should have* received the same or very similar amounts of fiscal transfers. Thereby, and to the extent that transfer receipts can be adequately predicted from observed covariates, the outcomes of treated municipalities are compared to those of their most credible counterfactual(s).

In the case of our binary petroleum variable on the other hand, the purpose of PSM is slightly different. Since the occurrence of oil across the set of Colombian municipalities can arguably be regarded as random, there are no variables that could help to predict the likelihood of having oil production or export sites within a given territory, or in other words, that help to determine a unit's probability of receiving treatment. Therefore, the matches for the weighted estimation of the treatment effect will be computed based not on factors that affect treatment status, but that municipalities with petroleum sites are, on average, more likely to exhibit. The basic idea - making municipalities with different levels of treatment look "the same" on a series of other specified covariates - is then equally met. In the following, I present the actual process and results of the matching procedure individually for fiscal federalism and natural resource rents.

5.3.1 Fiscal Federalism Rents

In selecting the variables that we believe predict the relative amount of transfers received by municipalities, we must ensure that we are not considering factors that are themselves substantially altered as a consequence of higher municipal dependence on fiscal transfers. Most of our indicators move slowly over time and can thus be argued to be relatively unlikely to cause bias in our prediction. However, where possible, I chose 2000 as the base year of the respective data to reduce endogeneity problems. Note that it was in 2001 that important fiscal federalism reforms were passed in Colombia.

Thus, our variables selected to predict municipal transfer dependence are those considered in the OLS regression above, while substituting the 2000 data for the log of GDP per capita (proxied), the size of the population, and the index of urbanization for the respective 2000-2007 averages. Besides, I added several squared and cubed terms to improve the fit of the regression at extreme levels of coverage.

As mentioned earlier, the success of the propensity score matching technique for assessing the weighted impact of fiscal federalism rents on electoral contestation depends to a great extent on the predictive strength of our variables for levels of municipal transfer dependence. The regression predicting average transfer receipts over the 2000-2007 for each municipality eventually had an R-squared of 0.6, representing an appropriate model fit.

For each municipality, the OLS regression produces a predicted level of transfers, which is a given municipality's propensity score. For illustrative purposes (see illustration 5.1), I plotted the propensity score of each observation against a given municipality's degree of electoral competition and introduced markers for high and low levels of actual municipal transfer dependence. Subsequently, I dropped observations at the lower and upper ends of the propensity score spectrum where cases have no or few matches with which they should be compared. Following Imai and Van Dyk (2004) I then partitioned the subset of observations into a fixed number of strata (in our case five) in which groups of observations have similar propensity scores. The idea is that within groups, variations in the level of transfers dependence are close to random, thereby generating the best possible circumstances for a causal effect analysis of fiscal transfers on electoral contestation. Moreover, the number of observations in each stratum serves as a basis for weighing the treatment effect across the full subset of observations.

Illustration 5.1 - Preprocessing for PSM

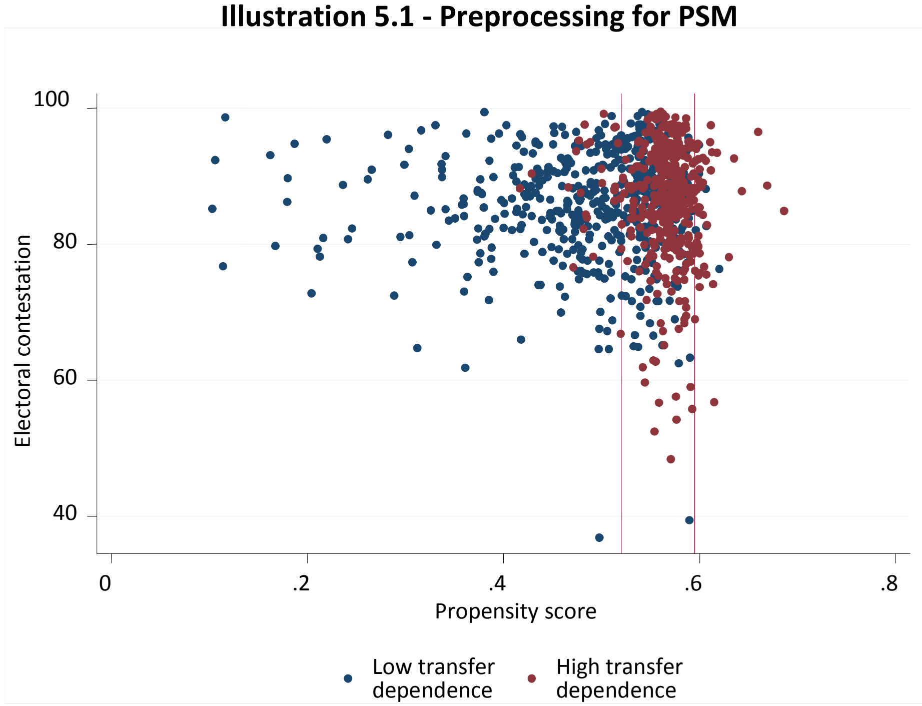
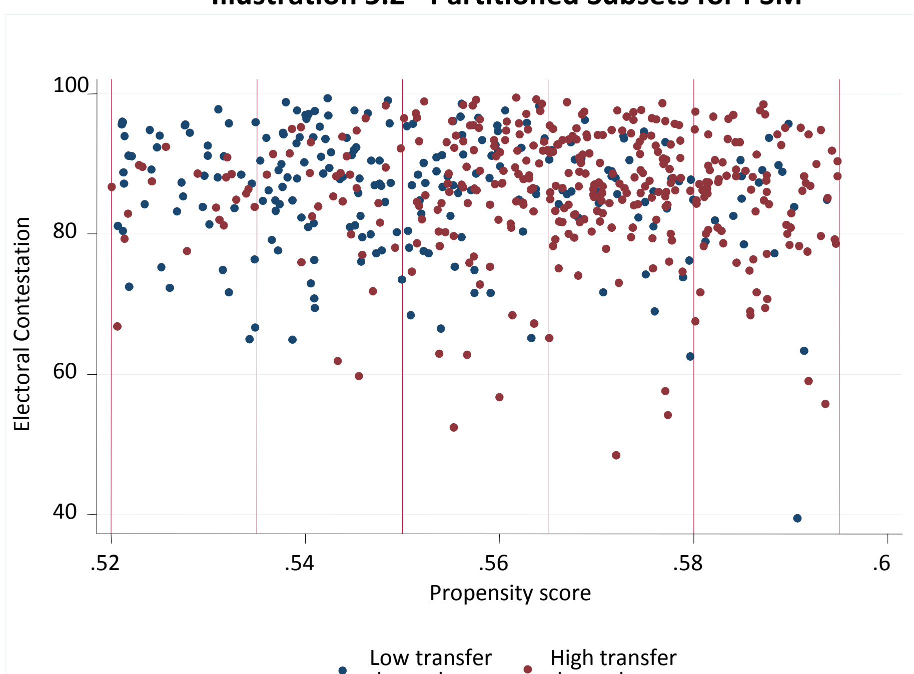


Illustration 5.2 - Partitioned Subsets for PSM



In order to estimate the treatment effect within each stratum, I simply regressed electoral competition on the level of transfer dependence, while controlling for each municipality's propensity score. Moreover, I added the standard errors of the individual regressions in order to obtain a weighted average treatment effect.[7] The results of the individual regressions and average treatment effect calculation are reported in table 5.2.

Table 5.2 - Predicting electoral contestation by fiscal federalism and natural resource rents: OLS Regression by propensity score

	Propensity Score Stratum				
	.52	**.535**	**.55**	**.565**	**.58**
Fiscal Fed. Rents	6.824 (15.86)	-10.01 (14.94)	3.889 (14.16)	18.18 (12.48)	5.33 (19.36)
Propensity score	-308.99 (216.75)	-186.99 (207.70)	397.57 (186.53)	-179.90 (141.86)	- 307.68 (217.65)
(Constant)	245.206 (112.921)**	193.762 (111.544)*	-132.71 (102.39)	178.73 (81.64)**	261.65 (127.67)**
N	N = 61	N = 104	N = 146	N = 170	N = 104
R^2	$R^2 = 0.03$	$R^2 = 0.01$	$R^2 = 0.03$	$R^2 = 0.02$	$R^2 = 0.02$
Overall Z (average treatment effect)			Z = 5.56		

Note: Reported above are OLS unstandardized beta coefficients with standard errors in parentheses and significance levels. *$p \leq 0.10$, **$p \leq 0.05$, ***$p \leq 0.001$.

[7] The formula for the calculation of the average treatment effect is $Z = \sqrt{\sum SE^2 p^2}$, where *SE* stands for the standard errors of the individual regressions per stratum and *p* for the proportion of cases in each stratum. See Imai and Van Dyk (2004) for a more detailed discussion of the calculation of average treatment effects in matching subsets.

As can be seen from the table, none of the regressions within the strata reach statistical significance, and accordingly, also the average weighted treatment effect is not significantly different from zero. Thus, the matching procedure leads us to qualify the initial finding in section 5.1 which suggested that a greater dependence on fiscal transfers translates into higher levels of electoral competition. Instead, our comparison of municipalities with similar levels of predicted levels of fiscal transfer dependence shows that there is no significant effect of fiscal transfers on electoral competition across the set of Colombian municipalities.

5.3.2 Natural Resource Rents

In calculating matches for a weighted estimation of the treatment effect of oil rents on electoral competition, I employ a logistic regression that reports the likelihood that municipalities had major oil production and export sites on their territory in the time period between 2000-2007. As noted earlier, the purpose of this regression is not to predict the occurrence of oil production or export sites, but to generate comparable treatment and control groups based on factors that municipalities with petroleum sites are, on average, more likely to exhibit.

The difficulty in generating this likelihood estimation consists again in selecting factors that are not themselves strongly affected by oil income. To create the most credible conditions of pre-treatment similarity, I thus drew on the 2000 values of GDP per capita and population[8] and also included two important historical variables: one indicating the number of indigenous populations in 1560, and a second providing an estimate of the size of slave populations in 1800. Moreover, for the matching formula, I performed exact matching for region in order to capture possible variation in regional patterns of the effect of oil rents on electoral contestation.

The result of the matching procedure for oil rents is reported in table 5.3. No statistically significant weighted effect of having either oil production or maritime export sites within a municipality is detectable. Thus, also the results of section 5.1 on oil rents and electoral contestation need to be reconsidered.

Table 5.3 - Predicting electoral contestation by natural resource rents: OLS Regression by propensity score

	Coefficient	**Z**	**P>|z|**	**N**
Average Weighted Treatment Effect of Natural Resource Rents	0.38 (1.57)	0.24	0.809	676

Reported above are OLS unstandardized beta coefficients with standard errors in parentheses and significance levels. *p ≤ 0.10, **p ≤ 0.05, ***p ≤ 0.001.
Number of exact matches = 1, Percent of exact matches: 85.95

[8] This provides a relatively unbiased estimate since this base year precedes the international commodity boom that unfolded later in the 2000s and led to substantial windfalls in resource royalties for the Colombian municipalities.

6. Discussion and Conclusion

Does non-tax revenue undermine the quality of subnational democracy in Colombia? The results presented in the preceding section disconfirm this proposition, showing no significant relationship between greater municipal exposure to fiscal rents and the level of contestation in local elections. If anything, there seems to be a political non-tax revenue "blessing" for Colombian municipalities, as evidenced by the direction of the coefficients of our predictor variables in the preliminary estimation of the full set of cases in section 5.1. Overall, these findings challenge the emerging consensus that non-tax revenues undermine democratic governance in subnational contexts.

Before moving to an interpretation of these results, it should be noted that there are reasons to doubt that our results have conclusive bearing on the question how non-tax revenues affect the quality of democratic politics at the subnational level in Colombia. It is particularly conceivable that the operationalization of electoral contestation used in this thesis - the margin between the winner and runner up in municipal elections - does not provide us with a sufficiently reliable indicator of this concept. Although important overall, narrow winning margins are not necessarily indicative of a truly contentious political arena. Particularly in contexts like Colombia, where local regimes face an increasingly consolidated democratic culture at the national level, subnational rulers may be inclined to use subtler tactics to disadvantage their competitors, which do not result in extraordinary electoral victories. Turnover data could be helpful in tackling this problem in the future, by enabling researchers to show how incumbencies vary in length for municipalities that receive different amounts of fiscal rents. With a view to this, also the inclusion of additional electoral rounds could also yield more robust results.

Besides these conceptual issues, our results do however give cause for a consideration of mechanisms through which large flows of rents may actually affect electoral contestation positively. The debate on the rentier state has hitherto neglected such mechanisms almost altogether, making this undertaking particularly worthwhile. Upon closer examination of the theoretical outliers in our sample then, interesting dynamics become visible. Again looking at Aguazul, for example, shows that while the 2011 electoral round there was won by the incumbent with a landslide margin of 38%, the municipality hosted a rather hard-fought campaign in 2007 (with three candidates garnering approximately one third of the vote each). Interestingly, as *Semana* (2007) noted, half a year before the ballot an unusually high number of candidates, both for the positions of mayor and the municipal representative, had registered very early in the process. Is it possible that Aguazul's royalty wealth, which peaked shortly before 2007, accounts for this heightened interest in attaining political office in Aguazul? A simple aggregate analysis of the full set of Colombian municipalities confirms this intuition: more rent-dependent municipalities have, on average, more candidates registered for the election. While this evidence is only suggestive, there are thus grounds to believe that higher levels of non-tax revenue promote electoral competition at the municipal level, by increasing the stakes of attaining political office in the respective municipalities. Future research should look into examining this mechanism in more detail, and ascertain in particular how such heightened levels of competition are connected to more fine-grained indicators of democratic quality.

In sum, our empirical findings appear to disconfirm the hypothesis that higher levels of non-tax revenues negatively affect the level of electoral contestation in Colombia's municipalities. While there are reasons to believe that fiscal transfer and natural resource abundance undermine subnational democracy through mechanisms that do not bear on electoral margins, our results do suggest that non-tax revenues promote electoral competition by raising the stakes of attaining political office.

Bibliography

Aslaksen, S. 2010. "Oil and democracy: More than a cross-country correlation?" *Journal of Peace Research* 47 (4): 421-31.

Bird, R. M. 2012. "Fiscal Decentralization in Colombia: A Work (Still) in Progress." In *Working Paper*. Atlanta: International Center for Public Policy.

Bräutigam, D. A., and S. Knack. 2004. "Foreign Aid, Institutions, and Governance in Sub-Saharan Africa." *Economic development and cultural change* 52 (2): 255-85.

Brennan, G., and J. M. Buchanan. 1980. *The power to tax: Analytic foundations of a fiscal constitution*. Cambridge: Cambridge University Press.

Chaudhry, K. A. 1997. *The price of wealth: Economies and institutions in the Middle East*. Ithaca: Cornell University Press.

Dahl, R.A. 1972. *Polyarchy: participation and opposition*. New Haven: Yale University Press.

Daughters, R., and L. Harper. 2007. "Fiscal and Political Decentralization Reforms." In *The State of State Reform in Latin America*, ed. E. Lora.

Departamento Nacional de Planeación. 2013. *Asignación Historica de las Participaciones Territoriales 1994-2012* 2012 [cited 12 April 2013]. Available from https://www.dnp.gov.co/Programas/DesarrolloTerritorial/FinanzasP%C3%BAblicasTerritoriales/Hist%C3%B3ricodeParticipacionesTerritoriales.aspx.

———. 2013. *Sistema General de Regalías* 2013 [cited 12 April 2013]. Available from https://sgr.dnp.gov.co/Inicio.aspx.

Dunning, T. 2008. *Crude Democracy: Natural Resource Wealth and Political Regimes*. Cambridge: Cambridge University Press.

el-Beblawi, H., and G. Luciani. 1987. *The Rentier State*. Vol. 2. London: Routledge Kegan & Paul.

Gervasoni, C. 2009. Fiscal Federalism as a source of rents: Subnational rentier states and democracy in Argentina. Paper read at APSA 2009 Toronto Meeting Paper.

———. 2010. "A Rentier Theory of Subnational Regimes." *World Politics* 62 (2): 302-40.

Goldberg, E., E. Wibbels, and E. Mvukiyehe. 2008. "Lessons from Strange Cases Democracy, Development, and the Resource Curse in the US States." *Comparative Political Studies* 41 (4-5): 477-514.

Haber, S., and V. Menaldo. 2011. "Do natural resources fuel authoritarianism? A reappraisal of the resource curse." *American Political Science Review* 105 (1): 1-26.

Herb, M. 2005. "No representation without taxation? Rents, development, and democracy." *Comparative Politics*: 297-316.

Hirschman, A. O. 1977. "A generalized linkage approach to development, with special reference to staples." *Economic development and cultural change* (25).

Ho, D. E., K. Imai, G. King, and E. A. Stuart. 2007. "Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference." *Political analysis* 15 (3): 199-236.

Huntington, S. P. 1991. *The Third Wave: Democratization in the late twentieth century*. Vol. 4. Norman: University of Oklahoma Press.

Imai, K., and D. A. Van Dyk. 2004. "Causal inference with general treatment regimes." *Journal of the American Statistical Association* 99 (467).

Jensen, N., and L. Wantchekon. 2004. "Resource wealth and political regimes in Africa." *Comparative Political Studies* 37 (7): 816-41.

Kurtz, M. J., and S. M. Brooks. 2011. "Conditioning the “Resource Curse”: Globalization, Human Capital, and Growth in Oil-Rich Nations." *Comparative Political Studies* 44 (6): 747-70.

Mahdavy, H. 1970. "The patterns and problems of economic development in rentier states: The case of Iran." *life* 1000: 1.

McMann, K. M. 2006. *Economic autonomy and democracy: hybrid regimes in Russia and Kyrgyzstan*. Cambridge: Cambridge University Press.

Mommer, B. 2002. *Global oil and the nation state*: Oxford University Press Oxford & New York.

Moore, M. 1998. "Death Without Taxes: Democracy, State Capacity, and Aid Dependence in the Fourth World." In *The Democratic Developmental State: political and institutional design*, ed. M. Robinson and G. White: Oxford University Press.

Morrison, K. M. 2009. "Oil, nontax revenue, and the redistributional foundations of regime stability." *International Organization* 63 (1): 107-38.

Musgrave, R. A. 1959. *The theory of public finance: a study in public economy*. New York: McGraw-Hill.

Perry, G., O. Ogunkola, M. Olivera, and B. Fowowe. 2010. "Oil and Institutions “Tale of two cities”: Nigeria and Colombia ". Bogotá: Fedesarrollo.

Perry, G., and M. Olivera. 2009. "El impacto del petróleo y la minería en el desarrollo regional y local en Colombia." In *Documento de trabajo de Fedesarrollo*. Bogotá: Fedesarrollo.

Registraduría Nacional del Estado Civil. 2013. *Histórico de Resultados Electorales* 2013 [cited 12 April 2013]. Available from http://www.registraduria.gov.co/-Historico-de-Resultados-.html.

Rojas, N., and D. Forero. 2011. "Bonanza Petrolera: ¿Como Aprovecharla?" In *Concurso Germán Botero de los Rios 2010*. Bogotá: Fedesarrollo.

Ross, M. L. 2001. "Does oil hinder democracy?" *World Politics* 53 (03): 325-61.

Schumpeter, J. A. 1942. *Socialism, capitalism and democracy*. New York: Harper and Brothers.

———. 1991. "The Crisis of the Tax State." In *The economics and sociology of capitalism*, ed. R. Swedberg. Princeton: Princeton University Press.

Semana. 2013. *Aguazul saudita* 2007 [cited April 12 2013]. Available from http://www.semana.com/nacion/articulo/aguazul-saudita/83882-3.

Smith, A. 2008. "The perils of unearned income." *Journal of Politics* 70 (3): 780-93.

Soifer, H. D. 2006. *Authority over distance: explaining variation in state infrastructural power in Latin America*. Cambridge: Harvard University Press.

World Bank. 2009. "Colombia - Decentralization : Options and Incentives for Efficiency - Sector Annexes." In *Report No. 39832-CO*. Washington, D.C.: World Bank.

Zucco, C. forthcoming 2013. "When Pay Outs Pay Off: Conditional Cash-Transfers and Voting Behavior in Brazil 2002-2010." *American Journal of Political Science*.