The politics of booms and busts: fiscal policy over the business and electoral cycle in developing countries

Martin Ardanaz

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Abstract

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How do countries, through their political institutions, adapt fiscal policy to economic and political shocks? The goal of this dissertation is to explain variation in the response of public spending and the fiscal balance to the business and electoral cycle across a large sample of countries. I develop a theory that builds on the political agency problem to argue that a government's ability to run prudent spending decisions over the business and electoral cycle is conditional on the structure of public finance (e.g. where does revenue come from?). Government revenue stems from two main sources: general taxation, and fiscal windfalls derived from natural resource wealth such as oil royalties, or grants from foreign aid. The key assumption of the theory is that each of these two revenue sources affects the amount of *information* that voters have about the true state of public finance, and thus the degree of uncertainty about the extent of rent extraction by incumbents. When governments rely on fiscal windfalls to finance most of their expenditures, voters have incentives to behave as fiscal liberals and demand higher public spending in the face of a positive economic shock. The reason is that while taxes are perfectly observed by voters, windfalls that accrue directly to government coffers are not, limiting voter ability to keep rent seeking politicians under control. Thus, fiscal policy is driven by voter's demands. I offer cross-national and subnational empirical evidence that is consistent with this theory: fiscal policy is more procyclical, political budget cycles prevalent, and levels of fiscal transparency lower in places with greater dependence of windfall revenue.

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Introduction

The global economic crisis of 2008-2009 revived interest in the stabilization function of fiscal policy in both academic and policy circles. While some countries (including developing nations) used available fiscal space to support active countercyclical measures, such as selective tax cuts and increases in social transfers to vulnerable groups, others (including some industrial countries) were obliged to set fiscal adjustment measures such as public spending cuts and the reduction of primary deficits, limiting the capacity of fiscal policy to provide stimulus and mitigate the collapse of domestic demand. What explains such diversity in policy behavior? In other words, why is fiscal policy *procyclical* (e.g. government spending increases in good times and falls in bad times) in some countries but not in others? This question is not only of policy interest, but has also important theoretical connotations, as it relates to classic debates in comparative political economy about why are some countries able to adapt or adjust public policy to changing economic conditions while others fail to do so.[1]

Traditional (e.g. economic based) explanations usually emphasize the role of credit constraints in shaping the behavior of fiscal policy over the business cycle. The argument goes that developing countries find it hard to follow countercyclical policy measures because they lack access to international credit during recessions, suggesting that any explanation of

[1] In addition to the issue of procyclicality, the question about the differential capacity of countries to adjust policy has been asked in a variety of policy contexts such as macroeconomic stabilization (Alesina and Drazen 1991), structural reforms in developing (Rodrik 1996) or transition countries (Frye 2010), and welfare state retrenchment in develped economies (Pierson 2001).

procyclical behavior needs to take into account the issue of credit constraints or limited creditworthiness *during downturns*. However, the problem with this economic explanation is its inability to provide answers to the following questions: why can't countries self-insure by accumulating fiscal resources in good times? Why would lenders not provide funds to countries if they were convinced that borrowing would help smooth out the cycle in the first place? Similar problems pervade arguments that link procyclical policy with volatility (Talvi and Vegh 2005) or patterns of integration in the world economy (Wibbels 2006). If anything, these variables may actually point in the opposite direction of a procyclical bias: the more volatile and exposed an economy to international trade, the higher the incentives for politicians to behave in a countercyclical way, by creating fiscal instruments such as stabilization funds, cyclically adjusted balance based fiscal rules, or allocating higher shares of automatic stabilizers (e.g. unemployment insurance) in the budget. After all, this is exactly how some small and open economies adapted their fiscal policy to changing economic conditions, leading to a robust positive relationship between trade openness and government size during the post World War II era (Cameron 1978; Katzenstein 1985; Rodrik 1998).

The difficulties of an approach solely based on crisis episodes or volatility are coupled with one of the key lessons learned from the recent Great Recession: only countries that pursued more prudent fiscal policies during the pre-crisis period were then able to implement more aggressive and consistent countercyclical policies during the downturn (IMF 2009). This suggests that in order to explain why fiscal policy is more procyclical in some contexts more than others a shift in focus is needed: in particular, one needs to look at the behavior of fiscal policy *during booms*.

Several political economy theories study the determinants of fiscal behavior during good times, providing important insights on what features of political institutions and economic structure make procyclical biases more likely to occur.[2] Yet, with few exceptions (Alesina et al. 2008), most of these accounts tend to neglect the role of *voters* in shaping fiscal policy outcomes. This omission by the literature is particularly problematic when considering the basic fact that in democracies, expenditure decisions can affect the politician's likelihood of remaining in power, and if such consequences can be anticipated, one would expect politician's to modify their fiscal behavior accordingly.

The argument

This dissertation brings voters back into the picture and building on a principal-agent framework of public finance, tries to explain variation in the response of fiscal policy to economic (business cycle) and political (elections) shocks across a large sample of countries. The basic argument is that government's ability to run prudent spending decisions over the business cycle is conditional on the nature of the budget constraint, or structure of public finance (e.g. where does revenue come from?). Government revenue stems from two main sources: taxes (on goods and services, corporations, individuals, etc.) and non-tax revenues or *fiscal windfalls* derived from natural resource wealth such as oil, grants from foreign aid, or intergovernmental fiscal transfers for a subnational government, in the context of fiscal federal arrangements.[3]

[2] See Tornell and Lane (1999), Talvi and Vegh (2005), Ilzetzki (2009), Woo (2009) among others.

[3] Throughout this dissertation, I use the term fiscal windfall as a shorthand for any type of revenue that does not require the collection of private income from citizens. More formally, revenue windfalls are defined by their disproportionate revenue-to-cost ratio compared to the standard production of goods and services in the economy (Dalgaard and Olsson 2006).

In general, tax and windfall revenue tend to be *substitute* revenue basis, in the sense that economies that for example are more resource intense have weak ex-ante incentives to invest in fiscal capacity, understood as the state's ability to extract tax revenue from the public in general, and from broad tax bases such as income and consumption in particular (Besley and Persson 2011). Figure 1 provides initial information about this basic tradeoff in a sample of 107 countries observed between 1990 and 2007: the overall tax take tends to be relatively low in the presence of fiscal windfalls (measured here as the share of fuel exports in total exports).[4]

Figure 1: Natural resources and fiscal capacity (1990-2007)

Recent studies provide more robust cross-country empirical (panel) evidence on the negative impact of access to natural resource revenue on domestic tax effort (Bornhorst et al. 2009, Jensen 2011; Perry and Bustos 2011). In addition, similar relationships have been shown

[4] In addition to overall tax levels, the negative relationship between taxes and windfalls is observed when looking at the issue of tax composition (such as the share of personal income taxes in GDP).

for the case of foreign aid, such as grants (Gupta et al. 2003; Knack 2008), and in the context of (fiscal) decentralization, there is evidence that some types of intergovernmental transfers tend to promote low levels of fiscal effort by making regional or local level governments neglect own sources of revenue generation, thus falling prey to problems of fiscal laziness (Desai et al. 2003; Perry and Olivera 2009; Artana et al. 2012). Both foreign aid and intergovernmental transfers share a number of similarities with natural resource fiscal revenues, to be explained below.

Given the distinction between taxes and fiscal windfalls, the key assumption of the theory is that each of these two revenue sources affects the amount of *information* that voters have about the true state of public finance, and thus the degree of uncertainty about the extent of rent extraction by incumbents. Specifically, the theory assumes that voters have more information about the taxes they pay than the amount of windfall revenue that governments receive. Why? First of all, consider the revenue collection technology: fiscal windfalls accrue directly to government coffers, without any need of private collection from citizens. Secondly, consider the incentives for incumbents to be transparent about the exact size of the windfall. To the extent that windfalls increase total budget size, if opacity marks the budget process, then this provides leverage for incumbents to please imperfectly informed voters with public goods, which are useful for reelection purposes, while at the same time grabbing residual rents for themselves.

Thus, when governments fund a significant share of their spending with fiscal windfalls, citizens have less information about the total revenue base, and opportunities for rent seeking politicians to capture public funds increase. In the face of a positive economic shock (e.g. such as a commodity boom), the voters' optimal response is then to demand higher levels of public goods in order to restrain this rent-seeking behavior. However, this induces a procyclical bias in

public spending: voters demand public goods in good times and incumbent politicians supply in order to stay in power.

Thus, the micro-foundations of why fiscal policy is procyclical in some countries and not others depend in part, on the informational context in which voters find themselves. If taxes make up a large share of the total public budget, voters are more informed about the availability of fiscal resources in government coffers, reducing the opportunities for rent-seeking on behalf of politicians. Conversely, if windfalls represent the lion's share of public monies, voters are more uncertain about how much is up for grabs, and in order to tie the hands of incumbent politicians, demand higher levels of public goods. The flipside is that under some conditions, this induces policy to be procyclical.

Empirical implications

Several empirical implications follow from this argument. First, we should find that other things being equal, countries that fund most of their government expenditures with fiscal windfalls run more procyclical fiscal policy than countries that rely on domestic taxation. Secondly, the presence of fiscal windfalls should provide both a motive and an opportunity for incumbents to engage in opportunistic *political budget cycles*, that is, changes in fiscal policy during election years induced by incumbents desire for re-election. Finally, it is also possible to test the informational assumption: that is, the proposition that voters should be less informed about public budgets in countries that are more dependent on fiscal windfalls. In the context of fiscal policy, this issue can be approached through the lens of the determinants of *fiscal transparency*. In particular, if the working assumption of the theory has any empirical grounding,

we should observe more opaque budget procedures in countries where the structure of public finance makes windfall revenue the key component.

To test these two hypotheses and the informational assumption empirically, I rely on a broad time-series cross-sectional dataset including fiscal information for more than one hundred countries in a period expanding over forty years. In addition to these cross-national empirical exercises, I test the informational assumption with *subnational* level data by looking at the impact of the last oil boom on the local public finance of Brazil's more than 5000 municipalities. Together, the combination of cross-national and subnational tests provides empirical support for the propositions derived from the theory. To motivate the puzzle, argument and empirical evidence, I start by considering the varied fiscal response of two middle income democracies in Latin America to exogenous endowment shocks: Chile and Venezuela.

Motivation: evidence from Latin America

Latin America has been usually considered a fiscal basket case. Episodes of fiscal profligacy during good times, in which deficits were covered by printing money – resulting in high inflation, and in extreme cases, hyperinflation – or by tapping financial markets, leading to exploding debt ratios, often ending in debt crises, were usually followed by the tightening of fiscal policy during "sudden stop" episodes (e.g. large falls in capital inflows and skyrocketing interest rate spreads).[5] For example, Mexico and Argentina suffered deep recessions in 1995 as a result of the Tequila crisis. At the same time, both countries engaged in sharp fiscal adjustments, including cuts in targeted spending for the poor (Wodon et al. 2000). More systematic evidence of procyclical fiscal policy in a broader sample of Latin American countries during the 1980s

[5] See Calvo (1998).

and 90s is present in the pioneering papers of Gavin et al. (1996) and Gavin and Perotti (1997) at the Inter-American Development Bank.

Against this historical background, the last decade witnessed significant change in the fiscal policies of several countries in the region: average deficits declined steadily and debt ratios have improved (Vladkova-Hollar and Zettelmeyer 2008; IMF 2009; Daude et al. 2010), and in contrast to previous crisis episodes, several countries were able to implement effective countercyclical fiscal policy. While there is some debate in the literature about whether these changes were the result of structural or temporary factors[6], and recent studies caution about the potential problems induced by a tendency for not withdrawing the stimulus measures adopted during the last crisis (Powell 2012), there is no doubt that the shift during the 2000s has resulted in considerable heterogeneity in the conduct of fiscal policy across different countries (Clements et al. 2007; Villafuerte et al. 2010). One of the most striking contrasts is offered by the comparison of fiscal policy behavior in two commodity-exporting countries of the region: Chile and Venezuela, where copper and oil are important drivers of the economy, respectively.

As commodity exporters, both countries face a set of similar fiscal challenges stemming from the close connection between fiscal revenues and the volatility and unpredictable evolution of resource prices.[7] Yet, while public spending tracks closely the behavior of oil prices in Venezuela, in Chile the opposite phenomenon occurs with the price of copper.[8] More recently, the evidence shows that during the last commodity boom period (2003-2008), fiscal policy was

[6] See Izquierdo and Talvi (2008) and Vladkova-Hollar and Zettelmeyer (2008).

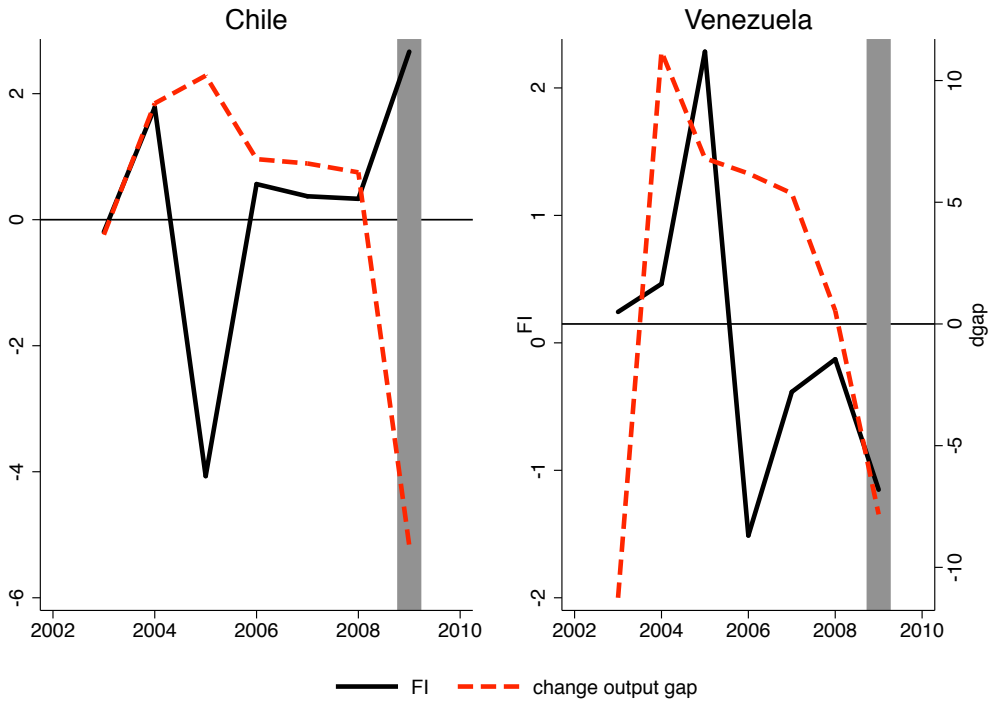
[7] For a discussion of the particular set of challenges that commodity abundance poses to public finance management, see Engel and Valdes (2000), chapters in Davis, Ossowski and Fedelino (2003), and Devlin and Lewin (2005).

[8] The correlation between real public expenditures and oil (copper) prices in Venezuela (Chile) is positive (negative) and statistically significant ($p<0.01\%$) in a long time series of data (1960-2010).

highly procyclical in Venezuela, and mostly acyclical in Chile (Izquierdo and Talvi 2008; IMF 2009; Villafuerte et al. 2010).

As result of these developments, policy reactions to the 2009 crisis differed significantly. While output contracted by more than 1.5%, fiscal policy was decisively countercyclical in Chile: real government spending increased by 11%, driven in part by a targeted transfer program to poor households. In contrast, total government expenditures decreased by 7% in real terms in Venezuela, in the wake of an output contraction twice as large as that of Chile (World Economic Outlook, Sept. 2011). Another way to capture variation in discretional policy behavior is by looking at the evolution of the structural fiscal balance and corresponding measure of *fiscal impulse,* that can be interpreted as the year-to-year change in discretionary fiscal policy once the effect of cyclical output and commodity price fluctuations have been removed (IMF 2009), as shown in Figure 2.

Figure 2: Fiscal impulse and changes in Output Gap in Chile and Venezuela (% of GDP)



As shown by the Figure, while both countries suffered negative changes in output gaps during 2009 (shaded region), the fiscal impulse (FI) in Chile was positive (indicating expansionary or countercyclical fiscal policy), whereas in Venezuela it was negative (indicating contractionary or procyclical fiscal policy). [9]

To explain this variation in policy behavior scholars have commonly focused on the role of good economic institutions, such as the existence of natural resource stabilization funds (NRFs) or fiscal rules based on structural balances, as solutions to restrict political discretion and foster prudent fiscal policy (Calderón and Schmidt-Hebbel 2008; Medina 2010; Frenkel 2011). The problem with this explanation is that both Venezuela and Chile count with similar formal mechanisms of stabilization and were even put into practice by incumbents with similar ideological orientations and background. However, while in Chile the NRF works adequately, in Venezuela it does not. In fact, against all economic rationale, in Venezuela the so-called stabilization fund accumulates reserves (in the form of contributions) when international oil prices are low, rather than high! In contrast, the NRF in Chile performs its countercyclical function since its foundation in the late eighties. Thus, one needs to look beyond institutional arrangements to understand the incentives of politicians to save fiscal resources under different economic scenarios.

In particular, an often-overlooked difference between these countries that this dissertation brings to the forefront is the revenue base, or structure of public finance. While both of these democracies are considered resource rich in the Latin American context, levels of fiscal resource dependence vary significantly between them, and more generally, across the region (Jimenez and Tromben 2006). In Venezuela, between 1992 and 2010, around 50% of total government

[9] The structural or cyclically adjusted balance (CAB) is the government's actual fiscal position after controlling for the budgetary consequences of the business cycle and other exogenous factors such as commodity price movements (IMF 2009). The fiscal impulse (FI) is simply the (year to year) change in the level of the structural deficit.

revenues originated from oil related sources on average. In Chile, while copper's share of fiscal revenues has increased significantly during the last commodity boom, this figure has remained at around 10% during the same period (Ossowski and Gonzales 2011).

As a result of such diverse fiscal foundations, I argue that differences in the amount of information available to voters about public budgets, or variation in levels of fiscal transparency, should be likely to emerge between these countries. In a budget survey of more than ninety countries developed by the *Open Budget Society* in 2010 and that will be studied in more detail later on, Chile's fiscal transparency score ranked in the top ten percentile of the distribution (with a score comparable to those found in OECD countries), while Venezuela had a score well below the mean for the Latin America region and world sample. I argue that given the informational constraints that Venezuelan voters face about the availability and use of public revenues by incumbents, it is rational for them to demand public goods in the face of a positive economic shock, and incumbent politicians will have incentives to engage in political budget cycles in order to remain in power. Such procyclical demands on behalf of voters and thus, the incentive for incumbents to manipulate the budget around election times, should be less intense in the Chilean context where fiscal windfalls represent a lower share of the total budget.

Plan of dissertation

The rest of the dissertation proceeds as follows. Chapter 1 develops the theoretical argument, which focuses on the trade-offs faced by voters and incumbent politicians when deciding over fiscal policy in the context of a principal-agent framework of public finance. In the framework, an incumbent decides between providing a public good or spend public resources in items that are not as valued by voters (rents). Voters decide whether to keep or oust the incumbent

conditional on the level of public goods received. The chapter shows how the structure of public finance (e.g. where does revenue come from?) informs these choices and concludes by providing a number of hypotheses on the expected behavior of fiscal policy over the business and electoral cycle.

The theoretical exposition is followed by two empirical chapters that test the propositions derived from the argument by exploiting cross-sectional and time-series variation in fiscal policy outcomes. In chapter 2, I look at the determinants of fiscal procyclicality, and show how windfall dependence affects the behavior of fiscal policy over the business cycle in a sample of more than one hundred countries observed over a forty-year period. In chapter 3, I study the behavior of fiscal policy in the proximity of elections, trying to identify interactions with the revenue foundations of democratic governments. In particular, the chapter focuses on the role of fiscal windfalls in generating electorally induced fluctuations in the budget in a sample of more than fifty democracies.

Chapter 4 takes a step back and examines more closely the key assumption of the theory: that voters should have less information about public budgets in the presence of large fiscal windfalls. In particular, I study whether reliance on fiscal windfalls makes it harder for voters to 'pierce the veil' of budgetary accounts and infer the true fiscal stance of the government. In the absence of cross-national survey data on voter awareness about these issues, I tackle the problem through the lens of fiscal transparency. Based on a cross-sectional analysis encompassing 117 countries, I study whether countries that rely on non-tax revenue to finance public expenditures tend to have lower levels of fiscal transparency, as assumed by the theory.

The last empirical chapter, Chapter 5, moves away from the cross-national exercises of previous chapters and provides a test of several aspects of the theory using subnational level

data. Exploiting the recent off-shore oil boom in Brazil, and based on a sample of more than 5000 municipalities observed between 2000 and 2009, this chapter explores the connection between oil wealth and fiscal transparency and the way elections and windfall wealth interact to affect the levels and composition of local government expenditures. Finally, in the Conclusion, I review the theory and empirical findings from the previous chapters and highlight the ways in which a focus on voters leads to novel predictions about the behavior of fiscal policy. I close the discussion with the policy implications of the dissertation as well as point out avenues of future research.

Chapter 1. Theory: A principal-agent framework of public finance

Procyclical fiscal policy is a pervasive feature across the developing world. Whether the fiscal instrument of choice to measure such behavior is government spending (Kaminsky et al. 2004), the tax rate (Vegh and Vuletin 2012), or fiscal outcomes such as the budget balance (Alesina et al. 2008), the empirical evidence is consistent with the notion that governments in developing countries find it hard to smooth fiscal policy over the business cycle. The typical behavior observed is one where during booms, government spending increases, tax rates decrease, and the fiscal balance deteriorates, and the opposite occurs during recessions: spending goes down, tax rates increase, and the fiscal balance improves. While during the last decade several developing countries have been able to overcome the procyclical policy bias (Chile), and some industrial countries (Greece) turned procyclical over the same period (Frenkel et al. 2011), the consensus is that the cyclical behavior of fiscal policy differs significantly across income groups.

Why would policymakers in developing countries pursue procyclical fiscal policy? After all, such a policy stance cannot be optimal. From a macro-perspective, procyclicality tends to reinforce the business cycle, exacerbating booms and aggravating busts. In addition, procyclicality tends to hurt the most vulnerable groups in society since the poor lack the assets to smooth out adverse income shocks. Finally, while theoretical models of optimal fiscal policy (e.g. neo classical tax smoothing, and Keynessian models) disagree about the effectiveness of fiscal policy in stabilizing output fluctuations, both traditions of economic theory do agree that, as a general rule, running procyclical policy is sub-optimal. Thus, theoretical reasons as well as country experiences make procyclical policy behavior in developing countries particularly puzzling.

According to tax smoothing prescriptions, governments should use budget surpluses and deficits as buffers to prevent tax rates from changing too sharply. In this theory, governments will run deficits in times of high government spending needs (e.g. wars, recessions) and surpluses when needs are low (e.g. peace, booms). Underlying the approach is the assumption that governments are benevolent. This chapter departs from this assumption and presents a theory in which reelection-seeking politicians make public spending decisions and voters decide whether to keep or oust the incumbent in the context of a principal-agent framework of elections.

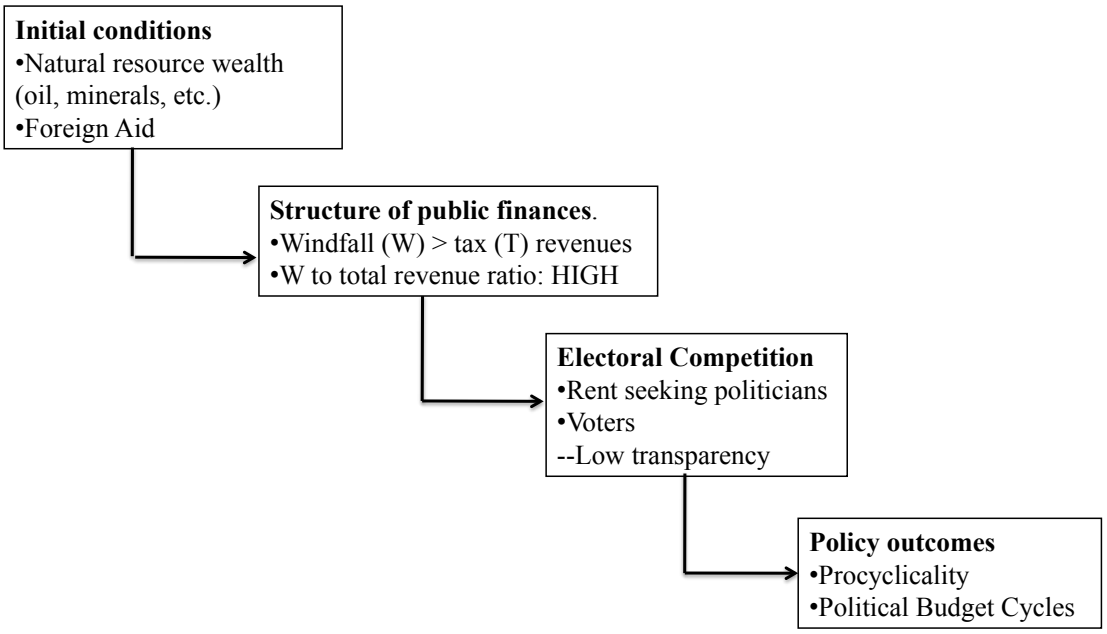
Within this setup, I introduce two frictions in the political process that will affect spending patterns over the business cycle. First, politicians can divert part of the public budget to spend it on items that benefit themselves, at the expense of voters (e.g. rents). Secondly, I assume that the amount of information available to voters about public budgets is not homogenous across political systems, but is in part, a function of the *structure of public finance* (where revenue comes from?). I distinguish between tax revenues and fiscal windfalls as two different sources of government revenue. I argue that the intrinsic informational implications of each differ, and that voters will have less information about the true state of public finance, and thus, the extent of rent extraction on behalf of incumbent politicians, when fiscal windfalls represent a large share of total revenues.

The theory emphasizes a number key trade-offs for both politicians and voters when making decisions over fiscal policy. From the perspective of politicians, incumbents would like to spend all public monies on rents, but need to provide some level of public goods in order to get reelected. From the perspective of voters, citizens would like governments to save resources during good times and save for a rainy day, but may distrust politicians with doing so, as they

may fear politicians will end up allocating saved public resources on projects that don't benefit them.

The way such trade-offs are solved is affected by a key parameter of the theory: the structure of public finance, which in turn affects the amount of information available to voters about how much fiscal revenue is up for grabs for incumbent politicians. When windfalls make up a large share of the total budget, voters are less informed about the total revenue base available to incumbents. This informational asymmetry, in the face of a positive economic shock, leads voters to demand higher levels of public goods for themselves in order to limit the rent-seeking behavior of politicians. If voters didn't make such demands, opportunistic politicians would choose to spend the windfall in goods that are not as valued by the voters. The down-side is that such demands generate a procyclical bias in fiscal policy: voters demand public goods during good times and incumbent's supply in order to stay in power. Thus, not only procyclical policy is obtained but also a *political budget cycle* (the tendency for fiscal variables to fluctuate across the electoral calendar), is likely to emerge in these contexts. In sum, an information gap characterizing electoral competition in democracies that rely extensively on fiscal windfalls is the key micro-foundation linking the structure of public finance to procyclicality and electoral budget cycles across developing countries. Figure 1.1 summarizes the argument's causal logic.

Figure 1.1: A principal agent theory of public finance



By exploring why fiscal policy is procyclical in some countries and not others, this chapter contributes to a theoretical literature focused on the political determinants of government's capabilities to adjust public policy to changing economic conditions (Battaglini and Coate 2007; 2008a, b). With one exception (Alesina et al. 2008), previous research on the subject has neglected the role of voters and elections in shaping the incentives for fiscal behavior over the business cycle. Drawing on a principal-agent framework of public finance allows me to shed light on a new mechanism to explain variation in levels of procyclicality across countries. Secondly, the theory developed next connects two phenomena that have so far been studied separately: procyclical policy and political budget cycles, which I argue have similar political foundations. Finally, the framework speaks directly to a literature discussing the political

conditions that allow voters to reduce the rents captured by politicians (Adserà et al. 2003; Persson et al. 1997; 2000). While this literature is primarily concerned with the role of political institutions (e.g. checks and balances) in reducing rent seeking incentives, the framework developed here adds a different source of variation in rent seeking opportunites: the structure of public finance, or the sources of government revenue. It suggests that each government source (taxes, windfalls) is associated with a particular "informational regime", making voters more or less able to control the extent of rent extraction by politicians. The goal of the framework is to develop the incentives such regimes generate for both voters and politicians, along with the policy implications that derive from each.

The chapter is organized as follows. Section 1 provides a background on principal agent models of public finance, the building block for the argument developed during the chapter. After stating the key assumptions of the theory (section 2), Sections 3 and 4 develop the argument and main testable hypotheses. Section 5 covers the scope conditions of the argument. Conclusions follow.

1.1 Background

The theoretical approach developed here follows the principal-agent framework of elections first introduced by Barro (1973) and Ferejohn (1986), as applied to public finance issues in textbook treatments such as Persson and Tabellini (2000, chapter 4) and Besley (2006, chapter 4). In general, political agency models of elections represent the democratic process as a game in which the players are voters and politicians. Politicians get to decide some dimension or vector of fiscal policy (the tax rate, government spending, debt) and voters decide retrospectively whether to reelect or oust the incumbent based on the former's performance.

Political agency models of public finance differ along at least three important dimensions.[10] First, a key point of departure is whether the pool of available candidates from which voters can chose from is homogenous (Persson et al. 1997), or politicians differ in their type or quality, such as competence or honesty levels (Caselli and Morelli 2004).[11] Second, the motivation of politicians for holding office can be diverse. Some models assume "opportunistic" politicians: following Downs (1957), politicians formulate policies in order to win elections, rather than win elections in order to formulate policies. Politicians are therefore "office seeking" and will chose platforms at the electoral stage in order to maximize the probability of victory and reelection. In contrast, "partisan" models of economic policy (Alesina 1988) and "citizen candidate" models of elections (Osborne and Slivinsky 1996; Besley and Coate 1997) assume that politicians are not interested in winning per se. Instead parties, or citizens, are ideological in that they care about policy outcomes, and represent different constituencies that hold diverse positions on economic issues.[12] Finally, politicians can be purely rent seeking: they maximize revenue for their own private agenda (Brennan and Buchanan 1980).

The third and final element in political agency models considers the amount of information that is available to voters about the policy process, or the nature of uncertainty. In moral hazard models, voters are uncertain about the policies or actions of politicians (Barro 1973; Ferejohn 1986). In adverse selection models of elections, voters are uncertain about politician types, such as the level of politician's competence in providing public goods, and

[10] See Besley (2006, chapter 3) for a comprehensive discussion.

[11] Recent agency models of public finance tend to combine both moral hazard and adverse selection issues (Besley and Smart 2007). For a more general treatment of this issue, see Fearon (1999).

[12] In particular, parties have different preferences over inflation and unemployment and try to maximize the utility of their constituents. Left parties represent the interests of lower middle class groups and unions, and care more about unemployment relative to inflation. In contrast, right parties represent upper middle class and business groups and are interested in keeping inflation low relative to unemployment (see Alesina and Rosenthal 1995).

policies are used by incumbents to signal their type, especially during electoral years (Rogoff 1990; Rogoff and Sibert 1988).

The framework developed next makes choices and assumptions along each of these dimensions. First, I assume a pool of ex ante identical candidates from where a challenger is selected so that elections serve the purpose of holding incumbents accountable for bad behavior ex post. Secondly, I take politicians to combine opportunistic and rent-seeking incentives, so that incumbent's tradeoff spending public revenues on personal perks and implementing policies conducive to reelection.[13] Finally, I introduce a novel source of informational asymmetry between voters and politicians, one that derives from the structure of public finance and has been so far overlooked in studies of fiscal procyclicality. By exploring the informational implications of tax revenues and fiscal windfalls, I propose a rationale for why it is the case that certain political systems make it difficult for voters to know exactly what is the true state of public finance, and derive the effects that such informational regimes produce on policy behavior.

1.2 Assumptions

Consider a political system including two time periods: in each, an incumbent makes decisions about government spending, between periods, there is an election in which a representative voter chooses between an incumbent politician and an identical challenger. To reflect changes in the business cycle, suppose the economy can be either in a "boom" or in a "recession".[14]

[13] The assumption of opportunistic, as opposed to partisan, politicians in this framework is grounded on two fronts: first, a certain degree of office seeking behavior seems necessary in any model of the policy process, given that all politicians (be they partisan or not) need to win elections first in order to make policy decisions afterwards. More importanly, the behavior of fiscal policy over the cycle is a "common value" policy, or issue that does not divide across partisan lines: both parties on the right and left tend to agree on the costs of running procylical policy. For right wing parties, over-spending during good times may lead to inflation, For left wing partisans, a procyclical policy bias during booms may hamper attempts at protecting their key constituents (the poor) during bad times.

[14] See Battaglini and Coate (2008) on productivity shocks and fiscal policy reactions.

The incumbent chooses to provide a level of public goods, which are valuable to voters, the tax rate, and a level of rent extraction, that is, goods that benefit politicians but not the general citizen. Politicians are opportunistic and rent-seeking: they care about grabbing rents for themselves, and enjoy other exogenous benefits from being in office (ego rents). The representative citizen derives utility from the provision of public goods net of taxes. The value of public goods to citizens varies across time periods: the marginal utility of public spending is higher during recessions than during booms. In other words, to the extent that private consumption and public goods are substitutes, government expenditures (e.g. social transfers) serve mainly an insurance function. [15] Importantly, note that this feature biases the theory against procyclical policies, a bias the frictions I introduce next will need to overcome.

To represent the structure of public finance, let government's revenue be a function of two main elements: taxes (T), and fiscal windfalls (W). While interesting comparative statics may emerge from situations in which both sources of revenue are important sources of government income, I assume for simplicity that only one these components tends to dominate in every political system, as shown in Figure 1 (Introduction), and keeping with the stylized observation of a negative correlation between access to windfall revenue and general levels of domestic taxation. As a consequence, each political system is associated with a particular informational regime, defined here as the extent of information that voters have about the availability and use of public resources by incumbent politicians.

In particular, the information structure is defined as follows. Voters observe public good provision and how much they are paying in taxes. But they do not observe government rents, and

[15] Another way to think about this is the following: assume if all private income is consumed by the representative citizen (there is no access to credit markets), then under this condition, government spending serves an insurance function. See Ilzetsky (2009); Engel et al. (2011).

in the context of political systems characterized by dependence on W, the windfall revenue shock is only observed by the incumbent. While the former assumption seems easy to justify, the latter needs some further elaboration.

The theory's key assumption is that the inferences that voters can draw about the full revenue base that is available to governments depend on the structure of public finance. In general, fiscal windfalls and taxation have different implications in terms of the information that is available to voters about government's activities. Specifically, I assume that fiscal windfalls (e.g. oil royalties, grants, intergovernmental transfers) are intrinsically less transparent than general taxation for two main reasons. The first reason is the *revenue collection technology* of each revenue source: fiscal windfalls accrue directly to government coffers, without any need of private collection from citizens.[16] Given this unmediated collection technology, voters lack a precise estimate of fiscal windfalls (they are less *visible* than taxes), so these can be more "easily stolen" than revenue flowing from general taxation.[17]

The second reason follows the first, and revolves around the notion of *informational rents*. It is reasonable to assume that incumbents in both tax and windfall political systems have access to much better information about the budget than the population at large, thus creating room for potential abuse by the holders of public office. However, I argue that the level of information asymmetry, and thus, the extent potential abuse, increases with the share of W in the total budget. As a consequence, the informational rents provided by fiscal windfalls conspire against investment in transparency-enhancing reforms in the fiscal process by incumbents. Since

[16] More formally, the realized value of the revenue shock, W, is known only to the incumbent.

[17] At this point, one could make the case that even different taxes (direct, indirect) or tax systems as a whole (single source, multiplicity of tax sources) vary in levels of "visibility", and thus, impact voter's perceptions about the costs of public goods, or what the Public Choice school dubs as "fiscal illusion" (Buchanan 1967; Buchanan and Wagner 1977). However, here I want to emphasize the variation induced by an often overlook difference between tax and non-tax revenue sources, rather than stress the subtleties across different tax sources.

fiscal windfalls help to increase total budget size, this provides room for incumbents to grab political rents, while at the same time avoid disappointing rational but imperfectly informed voters (Brollo et al. 2010). In other words, if taxes and spending are imperfect means of detecting rent extraction (Besley 2006), I argue that fiscal windfalls make this calculation even more difficult for voters.[18]

However, within the setup, lack of information about fiscal windfall availability is not absolute. Voters may infer the total revenue shock in a windfall environment from movements in commodity prices, which are relatively easy to access.[19] Yet, such signal is relatively noisy, and is contingent on the fiscal regime that links international commodity prices and government's coffers. Moreover, to the extent that individual taxpayers are able to see some connection between the level of public services provided and their own tax burden, this implies a link between expenditures and own contributions to the fisc, and thus, a way of keeping track of politician's rent seeking behavior. Such links are broken when windfall revenue makes up a large share of the total budget, which implies that voters may have a hard time trying to tie the hands of opportunistic politicians. In sum, the key assumption in this theory is that the representative citizen has more information about the taxes she pays than on the fiscal windfall the government receives.

Regarding this last point, note that a long tradition in political science argues that the effects of taxation vis a vis windfall revenue are behavioral rather than informational: when voters pay taxes they have more incentives to monitor closely politicians and enforce budgetary

[18] The implicit assumption here is that voters do not regard their own tax payments as being independent of the benefits of the public goods and services that they receive (more on this later).

[19] Formally, the structure of voter information can be given as follows: with some probability, W can be high or low and voters receive a signal of the windfall equal to the true state of the world with a probability slightly greater than a coin-toss.

oversight than when they don't (Bates and Lien 1985; Levi 1988; Brautigam et al. 2008).[20] According to this conventional perspective, -the *endowment* effect, in Sandbu's (2005) terminology- the lack of motivation that originates from not paying taxes results in a more politically quiescent population and thus, weaker restraints on opportunistic politicians, and even more, low levels of democracy (Ross 2001; Moore 2007).[21] This conventional perspective thus relies on strong assumptions about specific psychological traits or dispositions that make individuals in windfall environments somehow different from voters that pay higher taxes on a regular basis. The argument proposed here need not rely on such assumptions about differences in individual motivations. Instead, voters differ in their ability to infer how much revenue the government obtains from non-tax revenue sources, which is an informational constraint that operates and can be measured at the context, rather than individual, level.[22]

Further, I argue that voters in windfall contexts do not behave as passive principals as assumed by the conventional wisdom: on the contrary, the main argument proposed here is that procyclical policy is driven by voters who in the context of informational asymmetries, demand public goods to limit rent extraction by incumbents. However, voters in both contexts differ on their ability (not motivation) to learn about the true fiscal stance of the government: the more or less intrinsic informational benefits that paying taxes brings about are simply lacking in windfall environments. Having described the framework's setup and assumptions, several implications regarding the behavior of fiscal policy over the business cycle follow. First, I introduce a

[20] See Paler (2011) for an insightful micro-level (experimental) analysis of the behavioral effects of different types of revenue sources (taxation vs. windfall) in the Indonesian context.

[21] This conventional view has been recently challenged (Haber and Menaldo 2011). To the extent that oil may have non-democratic effects, it seems to be conditional on other factors, like inequality (Dunning 2008), or geographic location (e.g. in Latin America oil has not been an impediment to democratic advancement).

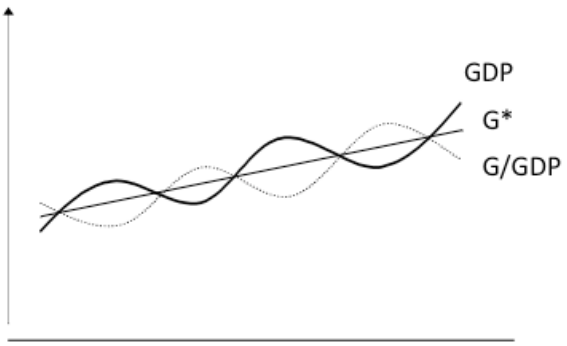
[22] Moreover, the endowment and informational mechanisms can work as complementary, rather than as alternative explanations: even in a country where citizens are motivated enough, it will be hard for them to monitor incumbent fiscal behavior if they are not informed about government's sources of income in the first place.

normative benchmark through which to compare the results obtained when fiscal policy is the outcome of a very stylized political process.

1.3 Optimal fiscal policy

In a world of benevolent social planners, fiscal policy should be countercyclical or at least acyclical. Since the benevolent planner would capture no rents, all government revenue is spent on public goods, and the source of government income, or the structure of public finanace, is irrelevant to the quality of spending. Under this scenario, there is no reason for voters to demand higher utility for themselves by over-demanding public goods in good times. In this context, public debt is issued in times of high spending needs (wars, recessions) and surpluses are accumulated during good times to repay fully previous period borrowing. Figure 1.2 provides an illustration of the spending pattern that would be obtained when a benevolent social planner that maximizes voter utility chooses fiscal policy over the business cycle. The bold line represents the ups and downs of the economy (and thus, how much revenue the govt. has access to). Note that public spending, G, increases steadily or acyclically at the long-term rate of growth of real income. Thus, the ratio of G to GDP should go down during booms and up in recessions.

Figure 1.2: Optimal fiscal policy



1.4 Political equilibrium and hypotheses

In the world of opportunistic/rent seeking politicians and imperfect information of the current setup, deviations from the optimal policy benchmark introduced above are common. To illustrate, suppose the economy is hit by a positive income shock (a boom) and the share of taxes in the total budget is large relative to windfall revenue. Since taxes make the bulk of government revenues, voters have (by assumption) more information about the total budget available to the incumbent, thus the latter's capacity to hide public funds for private uses is more limited. Under this situation, voters can make state-contingent contracts with politicians: the implicit contract between the representative citizen and the incumbent can be summarized in the following phrase: "tax me, but spend it well, or else..."

That is, in reacting to government policies, voters do not regard their own tax revenue as being independent of the services they receive. Although imperfectly, taxes and spending provide citizens with the means of detecting rent extraction by politicians. Armed with information provided by their own contributions to the fisc, voters can credibly punish politicians who engage in fiscal profligacy, so incumbents will therefore be less inclined to mismanage public finance over the business cycle, leading to a situation of either acyclical or countercyclical spending.

Now suppose that the same positive income shock (in the form of a commodity boom) is realized in an economy where fiscal windfalls make a substantive share of total revenues. Increasing the share W in total revenue produces two effects: (1) decreases the amount of information the representative citizen has on the total revenue base, and (2) increases the extent to which a rent seeking politician can capture public funds by hiding them. In the run-up to

elections, what is the optimal performance cutoff rule for re-election that a representative voter could come up with?

For starters, note that the marginal value of public spending is lower for voters in good times, which biases preferences against procyclical policy. However, effects (1) and (2) stated above make voters wary about how incumbent's will spend windfall revenue, that is, they are concerned about the allocation decision between public goods and rents. Given this informational asymmetry, this leads voters to raise their reservation utility and demand higher levels of public good provision in good times than would be expected under a perfect information scenario (or where taxes dominate). If they did not make such procyclical demands, rent-seeking politicians would choose to spend windfall revenues on goods that are not as valued by the voters (e.g. favors to special interests, personal perks). In response, the incumbent is tempted to spend too much in the current period (with less left for later in the case of a negative shock to the economy). The downside is that such pressures generate a procyclical bias in fiscal policy.[23] At the same time, note that the demand for public goods by voters is met from the supply side by opportunistic politicians who are likely to tinker with the budget, especially during electoral years, in order to influence electoral outcomes. Since relative to incumbents in tax environments, politicians in windfall contexts tend to enjoy the political benefit of spending but pay only a small fraction of the political cost of taxation, we should expect these authorities to use low-cost spending power to remain in office. In sum, there exists an informational gap in countries that are heavily reliant on fiscal windfalls, and such informational regime provides the

[23] In this vein, procyclical policy therefore, seems part of a broader set of "populist" policies which in the short run recieve support from a significant fraction of the population, but ultimately end up hurting their economic interests. See Dornbuch and Edwards (1991) for examples on such populist episodes during Latin America's economic history, and Acemoglu et al. (2011) for a recent formal model of the conditions that sustain populist policies in equilibrium (motivated by examples from Latin America).

basis for voters to make procyclical demands and incumbents ready to supply public spending in order to stay in power.

But why can't voters simply demand more transparency in windfall environments instead of public goods? At least two factors conspire against this more efficient alternative. First, it is important to note that fiscal transparency is one among a variety of budgetary *institutions*, which, as any institution, is relatively hard to change in the short run. Additionally, because of the informational rents that fiscal windfalls produce, incumbents are less likely to modify such institutions in the direction that would be optimal for voters. Finally, if in addition to the above, one imposes the plausible assumption of voter shortsightedness or impatience, then the room for transparency-increasing demands on behalf of voters is even more limited.

In sum, the discussion above suggests two hypotheses and one assumption amenable to empirical testing in a cross-national context:

Assumption 1.Voters ability to be informed about budget processes is limited in countries that are heavily reliant on windfall revenue to finance public expenditures.

H1. Levels of fiscal procyclicality should be higher in countries that depend mostly on windfall revenue to finance public expenditures.

H2. A political budget cycle is likely to emerge in countries that are heavily reliant on fiscal windfalls.

1.5 Scope conditions

The argument presented here is cast in terms of a representative voter and incumbent who decide over fiscal policy subject to periodic elections. It should not be interpreted as a claim that

non-democratic regimes should be less procyclical than democratic countries; rather, what matters for the argument is the variation in fiscal policy behavior induced by the structure of public finance *across* democracies. Thus, the argument is not intended to encompass theoretical debates or the empirical literature on the effects of regime type on economic policy, which is discussed elsewhere (Rodrik 2000; Bueno de Mesquita et al. 2003; Mullingan et al. 2004).

Additionally, by assuming a very stylized model of the policy process with a single policymaker, the argument abstracts from exploring how the form of government or the electoral rule interacts with the revenue foundations to generate different public spending dynamics. However, in presenting the theory this way, the argument seems more likely to hold in presidential or parliamentary regimes with majoritarian features and less likely to travel in political systems with parliamentary/proportional representation or presidential regimes with stronger checks and balances or higher number of veto players.[24]

Third, the theoretical argument is presented in rather general terms, but may have less bite in some contexts than in others. Specifically, the argument assumes that the access to fiscal windfalls (such as oil rents) is controlled and owned by the government. Variation in "ownership structure" across resource rich countries is thus omitted. While the assumption is empirically valid for the most part of the period under analysis (1960-2000s) where the vast majority of hydrocarbon-rich countries did, in fact, exercise state ownership over their natural resources, the logic of the argument may be weaker for other time periods or countries in which the oil sector's governance structure is more complex, as seems to be the case in former Soviet countries (Jones Luong and Weinthtal 2010).

[24] On the effects of political institutions on fiscal policy, see Persson and Tabellini (2003). Andersen (2011) provides empirical evidence that government expenditures are more responsive to oil shocks in presidential systems.

Finally, it is important to mention that while both the argument and empirical evidence that comes next are cast mostly, but not only, in terms of the impact oil rents on fiscal policy, the approach developed here goes beyond the traditional "resource curse" literature. To the extent that foreign aid, oil revenue, or intergovernmental transfers (for the case of a subnational government) share important similarities (low levels of transparency), we should expect this argument to apply to such settings.

Conclusion

This chapter developed an argument that builds on a principal-agent framework of public finance to explain variation in fiscal policy reactions to exogenous shocks. It differs from much of the existing literature on procyclicality by placing voters at the center of analysis. The theory posits that under some conditions, voters will demand public spending in good times in order to "tie the hands" of rent-seeking politicians and force them to spend on goods that are valued by them, inducing a procyclical bias in fiscal policy.

The main insight of this theory is that these conditions depend, in part, on the way governments finance those public goods that voters demand. The argument posits that each source of government revenue (taxes vs. windfalls) is associated with a particular informational regime: what voters may or may not observe regarding government's fiscal activities. In particular, fiscal windfalls (oil revenues, foreign aid, transfers) are assumed to be less *transparent* than general taxation, making voters more uncertain about the true state of public finance when W is large relative to T. As a result, the extent of the rent extraction problem is particularly acute in windfall environments. To deal with the issue of informational asymmetries, voters are lead to demand too much public spending in the current period with less left for a

rainy day, when government expenditures are more valuable. Thus, procyclical policy is driven by voters' demands.

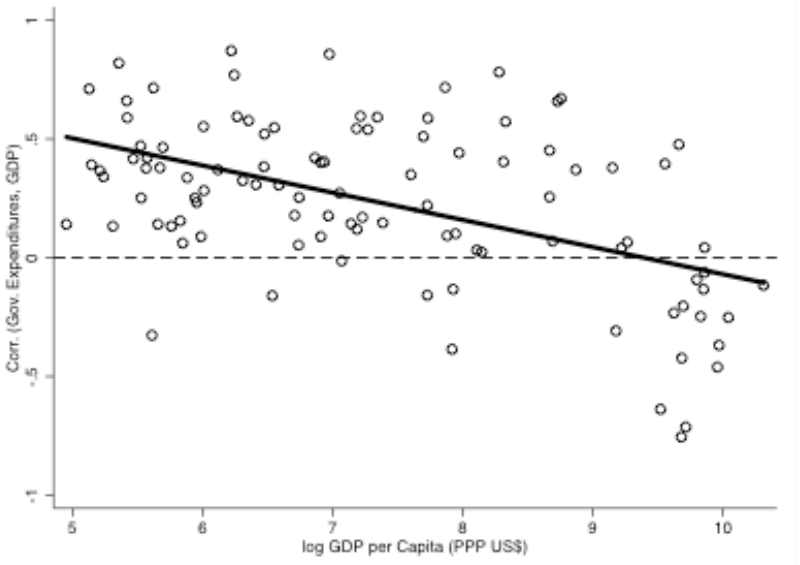
Existing theoretical literature has tended to underplay the role of voters by focusing exclusively on interest group rivalries in shaping fiscal policy outcomes.[25] However, to the extent that government's spending decisions can affect the incumbent's likelihood of remaining in power, such omission precludes extant scholarship from studying the electoral dimension of fiscal policy-making. This simplified framework provides the potential to overcome such limitations, and thus advance a new mechanism linking political incentives to fiscal policy outcomes.

[25] I review this literature in the next chapter.

Chapter 2. Fiscal windfalls and procyclicality

How do countries, through their political institutions, adapt their public policies to economic shocks? For example, how should countries decide fiscal policy in response to the business cycle? Standard tax smoothing (Barro 1979) and Keynesian models imply that fiscal policy should follow either an acyclical or countercyclical pattern: government spending should go down during booms and up during bad times. What does the empirical evidence show? While the above policy prescriptions are followed to a great extent in the developed world, government expenditures in many developing countries are actually procyclical, that is, a tendency for governments to expand public spending in good times and contract it during recessions (Akitoby et al. 2004; Kaminsky et al. 2004; Talvi and Vegh 2005). For example, Figure 2.1 plots the correlation between the cyclical components of real government expenditures and real GDP between 1960 and 2003, against the log of GDP per capita in 103 countries.

Figure 2.1: Cyclicality of Gov. Expenditures and Income Levels (1960-2003)



The negative correlation between the degree of fiscal procyclicality and per capita wealth is statistically significant at the 99% confidence interval. Notice that while most of the countercyclical countries are clustered in the developed world, there is a handful of developing countries that depart from the general rule of procyclicality.[26]

Moreover, using a regression based measure of procyclicality[27], Table 1 shows that total public spending reacts positively (and more than proportionally) to output shocks in developing countries only, while across the OECD the sign of the coefficient is essentially zero, implying on average, acyclical responses in accordance with tax smoothing prescriptions, regardless of whether country fixed effects (FE) are included or not.

Table 2.1: Cyclical response of government expenditures (1960-2003)

	OECD		Developing	
	1	2	1	2
Output_Gap	0.193	0.155	1.048***	1.057***
	(0.194)	(0.190)	(0.118)	(0.117)
Country FE	NO	YES	NO	YES
Obs	594	594	1583	1583

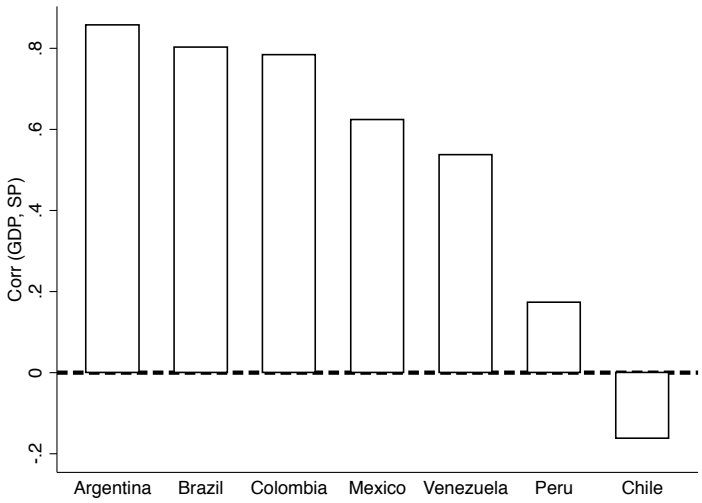
Controls: TOT_GAP, GovExpenditures(t-1)
***Significant at 1%

Finally, it is worth noticing that the variation in policy behavior between developed and developing countries is not only observed at the level of aggregate expenditures. Rather, it extends to some key components of public outlays, such as expenditures on education and health, which have been found to be especially procyclical in developing countries in general (Arze del

[26] South Korea, Colombia, and Jamaica are some of these exceptions in the dataset. Note that there are also OECD countries that depart from the typical countercyclical pattern (e.g. Ireland, Greece, and Portugal).
[27] See Appendix 2.1 for details on the measure.

Granado et al. 2010; Wibbels 2006), and Latin America in particular (Snyder and Yackovlev 2000; Wodon et al. 2000; Braun and di Gresia 2003). As an example of the procyclical behavior of social policies in developing countries, Figure 2.2 shows the correlation between the cyclical components of real GDP, and real social expenditures per capita for the seven largest countries in Latin America from 1990 to 2008, using data from ECLAC.[28] With one exception, the rest of the countries have tended to expand social expenditures during good times, only to adjust them at the worst of times.

Figure 2.2: Correlation between GDP and Real social expenditures per capita (1990-2008)

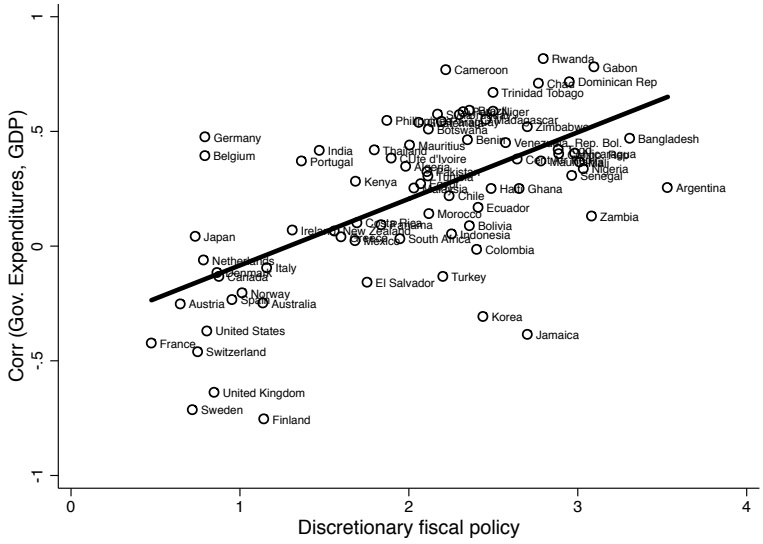


It is hard to underestimate the costs of procyclical fiscal policies, both in terms of their impact on aggregate welfare as well as their distributive consequences. Firstly, procyclicality seems to be in part a manifestation of the more general problem of (macroeconomic) policy volatility, traditionally considered a major determinant of economic performance (Ramey and

[28] Social policy is defined here as expenditures on education, health, social security, and housing.

Ramey 1995; Aghion et al. 2006).[29] For example, as shown by Figure 2.3, procyclicality is positively correlated with a measure of discretionary fiscal spending[30], which has been found harmful for macroeconomic stability and economic growth in previous studies (Fatas and Mihov 2003; 2005; Perry et al. 2007).

Figure 2.3: Discretionary fiscal policy and procyclicality



Secondly, a procyclical policy bias hampers attempts at protecting the most vulnerable groups during recessions (Hicks and Wodon 2001; Ravallion 2002). The poor are usually less able to cope with negative economic shocks because they: a) have limited access to credit

[29] However, more recent research finds no evidence that macroeconomic policies per se are a significant predictor of economic performance, especially after controlling for proxies for institutional quality (Acemoglu et al 2003; Easterly 2005).

[30] The term discretionary fiscal policy refers to changes in spending that do not represent a reaction to current macroeconomic conditions (Fatas and Mihov 2003, p. 1422). It is measured as the volatility of the ε term in a regression of the following form: $\Delta G=\alpha+\beta\Delta Y+\delta W+\varepsilon$ where G is government speding, Y is GDP and W other controls like time trends.

markets, b) have more informal and unstable jobs, c) do not have diversified assets that they can sell to smooth consumption, and d) they may suffer long-term effects from recessions, such as usually irreversible loss of human capital due to the consequences of malnutrition, loss of health, or loss of education (Lustig 2000; Braun and diGresia 2003). Thus, in the context of a fiscal adjustment, the overall effectiveness of social policy at protecting the poor is reduced during downturns (DeFerranti et al 2000).[31] In sum, exploring the determinants of procyclical spending biases in the developing world remains of crucial importance.

Why do many developing countries follow seemingly suboptimal procyclical fiscal and social policies that add to macroeconomic instability and hurt the poor the most? The first generation of scholarship tended to focus on the economic causes of procyclicality. For example, Gavin and Perotti's (1997) seminal contribution argued that developing countries find it hard to follow countercyclical policy because they lack access to international credit during recessions, suggesting that any explanation of procyclical behavior needs to take into account credit constraints or limited creditworthiness. However, the problem with this economic explanation is its inability to provide answers to the following: why can't countries self-insure by accumulating fiscal resources in good times? Why would lenders not provide funds to countries if they were convinced that borrowing would help smooth out the cycle in the first place?

To answer these questions, one needs to look at the political arena in general, and on the interaction between voters and elected politicians under different fiscal scenarios in particular. The basic argument of this chapter is that the revenue basis of governments should be considered a key explanatory variable in accounting for variation in levels of fiscal procyclicality. More specifically, I argue that countries that are relatively more dependant on non-tax revenue or fiscal

[31] See World Bank (2010) on the role of social protection policies in Latin America during the recent economic crisis.

windfalls (e.g. oil, minerals, foreign aid) to finance public expenditures will tend to have a hard time adapting public policy in the right direction: on average these countries will show higher levels of fiscal procyclicality.

Why is this so? As explained in the previous chapter, when countries finance most of their spending from windfalls, citizens lack information about how much resources the government has and its use, since this type of revenue flows directly to the government coffers, without any need for collection of private income from citizens. This lack of information or transparency in windfall environments leads voters to demand more public goods in good times, generating a procyclical bias in public spending. If voters did not make such demands, opportunistic politicians would choose to spend the windfall in goods that are not as valued by the voters (e.g. favors to special interests, personal perks). In sum, there exists an information gap (to be shown in chapter 4) characterizing electoral competition in democracies that rely extensively on fiscal windfalls, and that this is one of the sources of variation in levels of procyclicality across countries, which is the focus of this chapter.

The chapter is organized as follows. Section 1 reviews the literature on the political economy of procyclical spending and highlights the chapter's contribution to it. Section 2 provides both cross-sectional and time-varying empirical evidence that is consistent with the argument that procyclicality is linked to the revenue foundations of governments.

2.1 Political economy of procyclical spending: related literature

Political economy explanations of fiscal outcomes build on the idea that fiscal decisions are the result of political processes that involve actors with varied interests. These interactions take place

mainly between politicians and voters, and between politicians that represent diverse interests or constituencies. In this tradition, scholars have identified a number of political distortions that tend to generate a procyclical bias in fiscal policy. These distortions can be grouped in two types of problems: "cooperation" and "principal agent" problems.

Cooperation problems. A classic example of a cooperation problem is the well-known common pool problem (Ostrom, 1990).[32] In fiscal policy, the common pool is the budget that political players draw upon (financed from a general tax fund) to generate concentrated benefits (such as targeted public policies). Tornell and Lane (1999) develop a model in which multiple political groups compete for a share of the common pool, leading to a "voracity effect": a more than proportional increase in spending in response to an exogenous shock, such as a terms of trade windfall. Similarly, Talvi and Vegh (2005) advance a model in which abundant fiscal resources create pressures to increase public spending during booms. One problematic feature of these early models is that the voracity effect is simply assumed, but not analytically derived. Thus, subsequent scholarship has focused on the factors determine the intensity of the voracity effect across countries, and hence, variation in levels of fiscal procyclicality.

First of all, the number of actors drawing from the common pool has been found to be a relevant determinant of the voracity effect. The pressure to overspend during upturns increases as the number of groups increase. Braun (2001) and Lane (2003) find evidence consistent with this hypothesis for developing and OECD countries respectively: as the number of political veto players increases, fiscal policy becomes more procyclical.

[32] In this chapter, cooperation problems refer to the game played by multiple political actors with heterogeneous preferences that maximize objectives that, to some extent, include the welfare of their constituencies.

In addition to fragmentation, political polarization has also been hypothesized as a key determinant of procyclicality (Humphreys and Sandbu 2007; Ilzetzki 2009; Woo 2009). The intuition is that as the preferences over the desired distribution of public spending between political groups diverge (or more generally, the deeper the division prevalent among the groups), the greater will be the incentive of policymakers to spend too much while in power, leading to procyclical fiscal policies.

Principal-agent problems. In the cooperation models reviewed above, the role of voters is theoretically underspecified. This omission is particularly problematic if one is concerned about endogeneity issues: expenditure decisions can affect the politician's likelihood of remaining in power, and if such consequences can be anticipated, one would expect politician's to modify their behavior accordingly. Moreover, these models seem to neglect a basic tenet of electoral competition: that politicians devote public resources to remain in office and incumbents may engage in pre and post electoral fiscal manipulations (e.g. political budget cycles) to influence voters and retain power, a practice that is specially recurrent across the developing world (Ames 1987; Schuknecht 2000; Brender and Drazen 2004; Shi and Svensson 2006).

In an important exception, Alesina et al. (2008) develop a political agency model that brings voters back into the picture. The model is used to interpret their main empirical finding: a positive correlation between procyclical policy and measures of political corruption. They argue that procyclicality is driven by rational voters who in the context of information asymmetries[33] and corrupt governments, demand higher utility for themselves (in the form of public goods)

[33] Voters observe the state of the economy, but cannot observe government borrowing.

during good times in a "Starve the Leviathan" fashion. Faced with these procyclical demands, governments do not accumulate reserves during booms; on the contrary, they incur large debts.

The theoretical framework presented in the previous chapter shares important similarities with the Alesina et al. model. However, it tries to overcome two key limitations of their analysis. First, at the theoretical level, it remains unclear from their model what is the exact source of variation in voter's level of information, in other words, why are some voters more informed than others? In the framework presented in Chapter 1, the revenue foundations of governments provide the answer this puzzle. Secondly, a problem with their key explanatory variable, corruption, is that of a simple form of endogeneity. More specifically, an explanation of procyclicality based on corruption seems to lack causal depth (Kitschelt 2003), to the extent that such variable is the result of deeper historical, institutional, and structural factors. In the forthcoming analysis, I exploit the fact that natural resources (e.g. oil reserves) are randomly distributed across countries, to study the effects of windfall revenue on fiscal policy outcomes.

2.2 Fiscal windfalls and procyclicality: comparative evidence

Data. Based on a sample of 103 countries for the period 1960-2003 (See Appendix Table A2.1), I consider real government spending as an indicator of fiscal policy.[34] I employ two measures of procyclicality. First, following Kaminsky, Reinhart, and Vegh (2004) I use the correlation coefficient between the cyclical components of real GDP and real government expenditures between 1960 and 2003 to exploit cross-sectional variation. To explore time-variation in the data, I employ a regression-based measure of procyclicality (see Appendix for details).

[34] The spending variable includes central government consumption, investment, transfers, and interest payments. Ilzetzki and Vegh (2008) show that for studying the cyclical properties of fiscal policy in developing countries, there are no differences between looking at government consumption in isolation or at aggregate expenditures as done here. In addition, interest payments are acyclical both in developed and developing nations.

Before testing the plausibility of the argument, I start the empirical analysis by looking at the economic determinants of procyclicality. As pointed out in the introduction, a common reason to explain procyclical fiscal policy has to do with tight credit constraints (Gavin and Perotti 1997). According to this argument, procyclicality is mostly driven by a debt limit, and should be especially present during downturns. Thus, if the borrowing constraint argument is the only story in town, we should observe a positive beta coefficient (procyclicality) in a recession, but not in a boom.[35] Contrary to this expectation, I find policy to be procyclical during booms as well as in recessions in developing countries (Table 2.2). Note also that in developed countries, policy is particularly countercyclical during downturns.

Table 2.2: Cyclical response of public expenditures during different phases of the cycle (1960-2003)

	OECD		Developing	
Output_Gap X Boom	0.249	0.227	0.729***	0.808***
	(0.276)	(0.278)	(0.209)	(0.076)
Output_Gap X Recession	-0.592**	-0.598**	1.767***	1.767***
	(0.282)	(0.285)	(0.174)	(0.174)
Country FE	NO	YES	NO	YES
Obs	733	733	1583	1583

Controls: TOT_GAP, GovExpenditures(t-1)
***Significant at 1%; significant at 5%

Moreover, as shown by Table 2.3, there is no evidence that developing countries became procyclical only after 1982 (the year of the Mexican debt crisis), when limited creditworthiness became a binding issue for many developing nations.

[35] A boom (recession) is defined as a positive (negative) output gap.

Table 2.3: Cyclical response of public expenditures in different time periods

	Pre 1982				Post 1982			
	OECD		Developing		OECD		Developing	
Output_Gap	0.457	0.333	0.884***	0.940***	-0.123	-0.083	1.124***	1.205***
	(0.450)	(0.480)	(0.175)	(0.178)	(0.190)	(0.189)	(0.153)	(0.151)
Country FE	NO	YES	NO	YES	NO	YES	NO	YES
Obs	149	149	445	445	445	594	1138	1138

Controls: TOT_GAP, GovExpenditures(t-1)
***Significant at 1%

These initial results, coupled with empirical evidence showing that that the behavior of fiscal policy over the business cycle is *asymmetric*[36] (Balassone and Kumar 2007a), suggest that credit constraints cannot be driving exclusively the results across developing countries. This means that political economy factors that result in strong pressures for expenditure increase in goods might play a more important role than the traditional financial constraint argument in explaining the cyclical behavior of fiscal policy. The following subsection explores such political economy determinants.

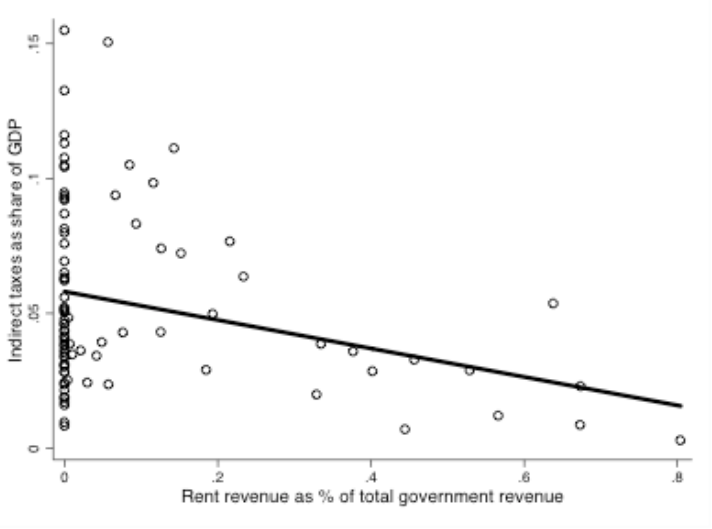
2.2.1 Measuring windfall revenue

What are the empirical counterparts of fiscal windfalls? The key independent variable to consider in this chapter is the yearly share of total government revenue that is financed by oil and/or other natural resources. In a study on the connections between taxation and democratization, Herb (2005) provides such a proxy by calculating yearly government revenues from mineral and oil sources. As shown by Figure 2.4, this proxy is indeed correlated with tax

[36]That is, the degree of procyclicality is higher during good times than bad times. More specifically, the effects of automoatic stabilizers are more than offset by discretionary policy when the output gap is positive. This is not the case during downturns.

effort in the expected direction: the more governments rely on rent or windfall revenues, the less need to tax the general population, as measured by the share of indirect taxes on GDP. Thus, the rest of the analysis relies on Herb's revenue "rentierism" variable, as our key measure of fiscal windfall (*FISCALW*), to explore its connections to fiscal spending over the business cycle.

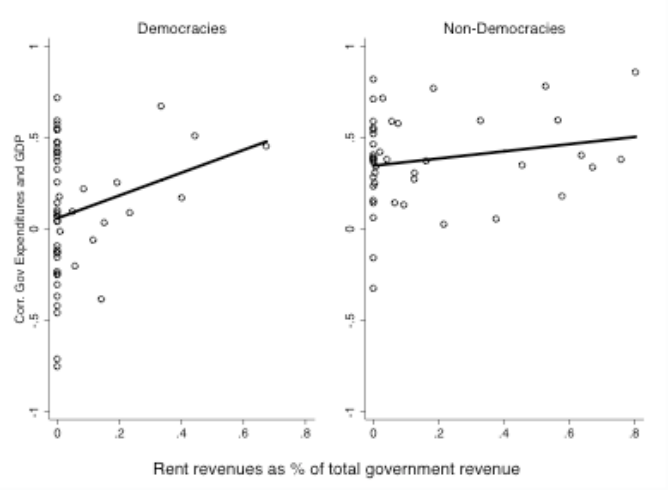
Figure 2.4: Rent revenue and taxation



2.2.2 Fiscal windfalls and procyclicality: cross-sectional variation

In this subsection I explore the relationship between resource rents and procyclicality in a cross-section of countries. Figure 2.5 plots the procyclicality data against the Herb "rentierism" measure and shows that the "effect" of windfall revenue on spending is somewhat more acute in democracies, suggesting that electoral accountability mechanisms of the type described in chapter 1 could be playing a role (The democracy variable is a dummy equal to 1 if the average Polity2 score over the sample period (1960-2003) is strictly positive and zero otherwise).

Figure 2.5: Resource rents and procyclical spending by regime type



Notice that the picture remains similar using an alterative measure of windfall revenue: Morrison's (2009) "non-tax revenue" variable which he defines as "what the government can spend without having to tax its citizens". His measure includes not only foreign aid and natural resource revenue attained through state-owned enterprises, but also borrowing-from abroad or the Central Bank-and all other revenue besides taxation, for example, other state-owned enterprise revenue, fines, and so forth (Figure 2.6).

Figure 2.6: Non-tax revenue and procyclical spending by regime type

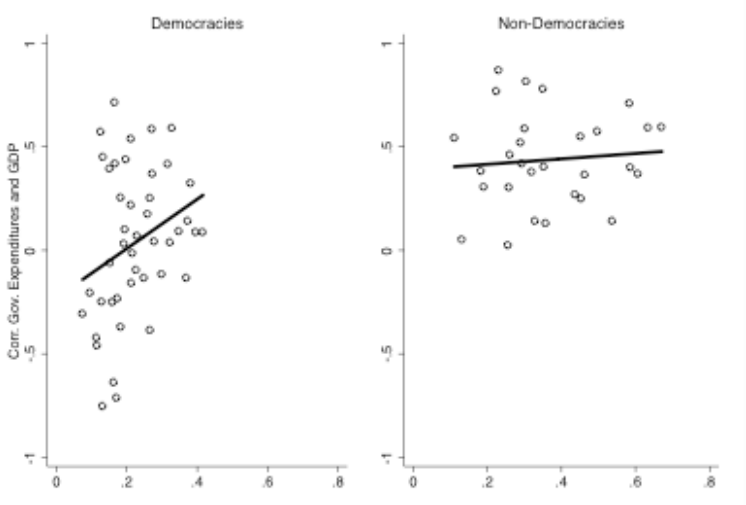


Table 2.4 provides results from a simple OLS estimation in which the procyclicality of government expenditures, expressed as the correlation coefficient between the cyclical components of real GDP and real public expenditures (1960-2003), is regressed on Herb's measure of fiscal windfall, *FISCALW*, plus a number of important covariates, such as per capita income, government size (central government spending as a percentage of GDP), levels of ethnic fractionalization (Alesina et al 2003), institutional variables, and regional dummies.[37]

Table 2.4: Determinants of procyclicality (OLS)

	1	2	3	4
FISCALW	0.540***	0.453*	0.621***	0.514**
	(0.195)	(0.237)	(0.165)	(0.219)
Initial gdp (log)	-0.082**	-0.048	-0.099***	-0.0639
	(0.0372)	(0.0595)	(0.0238)	(0.0428)
Government size	-0.004	-0.006*	-0.006**	-0.007**
	(0.003)	(0.003)	(0.002)	(0.003)
Ethnic frac	-0.008	-0.052	0.004	-0.044
	(0.116)	(0.153)	(0.119)	(0.160)
Control of corruption	-0.025	0.0243		
	(0.053)	(0.0560)		
Checks			-0.0002	0.0008
			(0.001)	(0.001)
Asia		0.183		0.0801
		(0.187)		(0.173)
LATAM		0.251*		0.170
		(0.134)		(0.142)
Africa		0.349*		0.227
		(0.181)		(0.175)
MENA		0.325**		0.238
		(0.160)		(0.160)
Constant	0.911***	0.500	0.910***	0.704*
	(0.317)	(0.531)	(0.308)	(0.414)
Observations	91	91	90	90
R^2	0.311	0.367	0.358	0.392

Robust Standard Errors in Parentheses
*** p<0.01, ** p<0.05, * p<0.1

[37] All independent variables enter as mean levels for the time period under analysis, except for GDP per capita, that takes initial values only.

Consistent with conventional wisdom, initial levels of per capita income and government size are associated with countercyclical fiscal policy (Akitoby et al. 2004; Braun 2001). Public sector size is intended to control for the role of automatic stabilizers in the budget: in countries with larger governments, transfers tend to represent a larger portion of total expenditure. These transfers-such as unemployment insurance and welfare benefits-tend to increase (decrease) automatically during recessions (booms), thus leading to countercyclical policy patterns (Fatas and Mihov 2011).

However, contrary to the expectations of previous political economy literature, the level of polarization in society (proxied by the degree of ethnic fractionalization, drawn from Alesina et al. 2003) and two different measures of institutional quality: a) control of corruption, from World Bank Governance Indicators (Kaufmann et al. 2001); and b) a measure of the number of veto players in the political system, such as *checks*, drawn from the Database of Political Institutions (Beck et al. 2000) were not found to be significant predictors of procyclicality.[38]

Finally, the OLS coefficient on FISCALW suggests that the effect of rent revenues on procyclicality is economically significant as well: depending on the model estimated, a 1% increase in the amount of the budget that is financed by natural resource revenue leads to around a 0.5 increase in the level of procyclicality (a variable that ranges on a -1 to 1 scale).

Nevertheless, one could (rightly) object that the level of "rentierism" is endogenous: policymakers have some discretion to affect tax structure and decide how much to depend on these resources to finance public expenditures. To deal with this problem, Table 2.5 presents results from a two-stage least squares model in which windfall revenue is instrumented on the first stage by two proxies of natural resource dependence and abundance, respectively, that lie

[38] An alternative measure of polarization, such as income inequality, as measured by the Gini index and drawn from the Standardized World Income Inequality Database (Solt 2009) was also found insignificant.

relatively away from the policymaker's discretion. Firstly, I instrument the degree of rentierism with Ross (2001) natural resource dependence *Oil exports* variable that measures the export value of mineral-based fuels (petroleum, natural gas, and coal) as a fraction of GDP. Secondly, the natural resource abundance instrument comes from Dunning's (2008) *Oil rents per capita* measure, defined as the value by year of production of a wide range of natural resources (oil, and gas), net of production costs and returns to capital.

Table 2.5: Determinants of procyclicality (2SLS)

	1	2	3	4
	Panel A: 2SLS			
FISCALW	1.054**	0.680***	1.052**	0.641***
	(0.464)	(0.228)	(0.470)	(0.215)
Initial gdp (log)	-0.137*	-0.102*	-0.108*	-0.0807*
	(0.0767)	(0.051)	(0.063)	(0.042)
Government size	-0.009***	-0.007***	-0.009***	-0.007***
	(0.003)	(0.002)	(0.003)	(0.002)
Ethnic frac	-0.239	-0.140	-0.272	-0.163
	(0.196)	(0.155)	(0.205)	(0.163)
Control of corruption	0.0772	0.0479		
	(0.068)	(0.059)		
Checks			0.001	0.001
			(0.003)	(0.002)
Asia	-0.045	0.054	-0.083	0.047
	(0.234)	(0.172)	(0.249)	(0.172)
LATAM	0.132	0.146	0.0602	0.114
	(0.158)	(0.133)	(0.174)	(0.126)
Africa	0.204	0.240	0.159	0.230
	(0.218)	(0.173)	(0.235)	(0.175)
MENA	0.085	0.200	0.024	0.179
	(0.250)	(0.177)	(0.273)	(0.176)
	Panel B: First stage for Fiscal Windfalls			
Oil rents per capita	0.011***	0.011***		
	(0.002)	(0.002)		
Oil exports			0.017***	0.018***
			(0.001)	(0.001)
Observations	86	86	84	84
R-squared	0.558	0.519	0.881	0.877

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note that regardless of the instrument of choice, reliance on natural resource rents is systematically related with procyclical fiscal spending. Moreover, using the oil rents per capita instrument, Table 2.6 confirms the findings from the previous graphical analysis on the relationship between procyclicality, windfalls, and political regimes: the impact of windfalls on fiscal policy behavior is especially significant across countries within the democratic camp. Note that I control for the presence of presidential regimes in the democratic sample, given that previous studies have found fiscal policy dynamics to differ across government forms (Persson and Tabellini 2003; Fatas and Mihov 2005; Andersen 2011).

Table 2.6: Cyclicality of government expenditures (2SLS)

	Democracies	Non Democracies
Oil rents per capita	1.357*	0.470
	(0.758)	(0.539)
Log (initial gdp)	-0.122***	-0.057
	(0.043)	(0.038)
Presidentialism	0.0001	---
	(0.100)	
Constant	1.040***	0.654
	(0.307)	(0.564)
Observations	48	41
R^2	0.21	0.01

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

The Democracy variable is a dummy equal to 1 if the average Polity2 score over the sample peridod (1960-2003) is strictly positive and 0 otherwise.

2.2.3 Resource rents and procyclicality: over time variation

So far, most of the discussion has concentrated on exploiting cross-sectional variation in the data to explain different levels of procyclicality. This approach, while common in the literature, suffers from important limitations. In contrast, this subsection takes advantage of the panel nature of the data to reflect how changes in my main variable of interest, *fiscal windfalls*, affect fiscal policy outcomes within each country over time.

Empirical strategy. In a panel of yearly data (1960-2003), I estimate the following equation by pooling all countries to gain efficiency and introducing country fixed effects, so that the estimates only reflect within-country variation:

$$\Delta F_{it} = \beta_i \, OutputGap_{it} + \gamma \, TOTGap_{it} + \theta F_{it-1} + \mu_i + \varepsilon_{it}$$

where F_{it} is fiscal policy indicator (government surplus, public spending), *OutputGap* is a measure of the business cycle, defined as the log deviation of GDP from its Hodrick-Prescott (HP) trend. *TOTGap* is a measure of terms of trade shocks, defined as the log deviation from a HP filtered series of the terms of trade, weighted by the degree of openness of the country (exports and imports over GDP) and μ_i a country fixed effect. The sign of β consistent with procyclical behavior depends on the specific measure of fiscal policy: When *F* is the budget balance (government spending), a negative (positive) and statistically significant coefficient means that the budget surplus (public expenditures) decreases (increase) with a positive output shock. My argument implies that procyclicality is more likely in countries that are more

dependent on fiscal windfalls. Hence, I interact the variable *OutputGap* with the measures used in the previous subsection, such as Herb's fiscal rents (*FISCALW*) and Ross' *Oil exports* variable.

Results. Table 2.7 presents results from regressing the change in the fiscal balance (columns 1 and 2) and public expenditures (columns 3 and 4), both scaled as percentage to GDP, on the main variables of interest. The additional regressors, *TOTGap*, and the lagged dependent variable, are included in all specifications but not reported for brevity. In columns 1 and 2, the signs of the interaction terms are negative, suggesting that as governments become more dependent on fiscal windfalls, the response of the fiscal balance to a boom is procyclical: the surplus goes down (deficit increases) in good times.

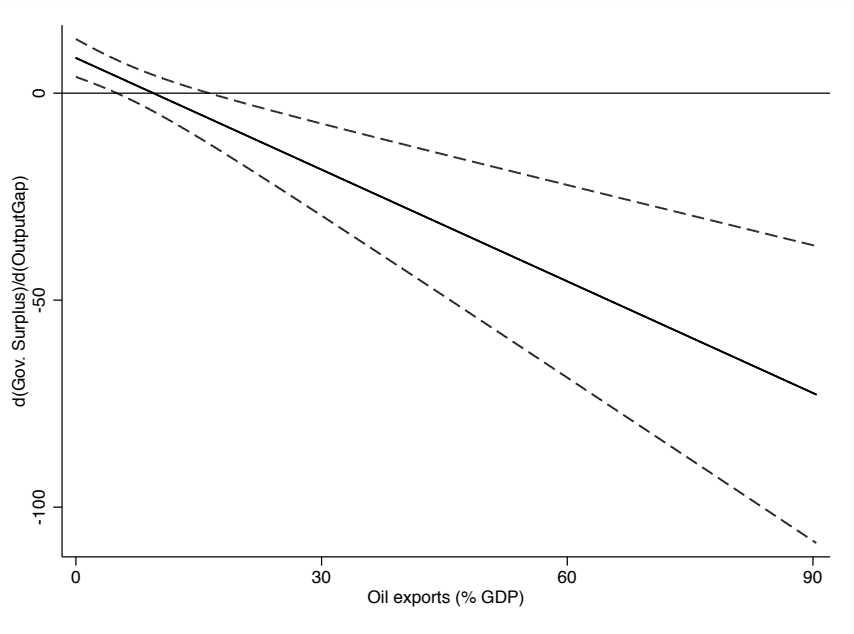
Table 2.7: Fiscal windfalls and the cyclicality of fiscal policy: fixed effects (1960-2003)

	Fiscal balance		Public Spending	
	1	2	3	4
Output_Gap	2.193		-1.213	
	(2.343)		(2.795)	
FISCALW	-2.476**		3.328***	
	(1.001)		(1.197)	
Output_Gap X FISCALW	-13.39*		18.02*	
	(7.832)		(9.362)	
Output_Gap		8.510***		-3.993
		(2.334)		(2.796)
Oil exports		-0.00776		0.0187
		(0.0182)		(0.0218)
Output_Gap X Oil exports		-0.899***		0.451*
		(0.214)		(0.256)
Observations	2348	2140	2355	2147
Countries	76	74	76	74
R^2	0.13	0.13	0.1	0.09

Controls: TOT_GAP, GovSurplus(t-1) in 1 & 2, GovExpend (t-1) in 3 &4
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Using the coefficients from Model 2, Figure 2.7 displays the marginal effect of the business cycle on the budget balance across the range of values of oil exports, with 95% confidence intervals around these estimated effects.

Figure 2.7: Marginal effect of *OuputGap*, with 95% Confidence Interval

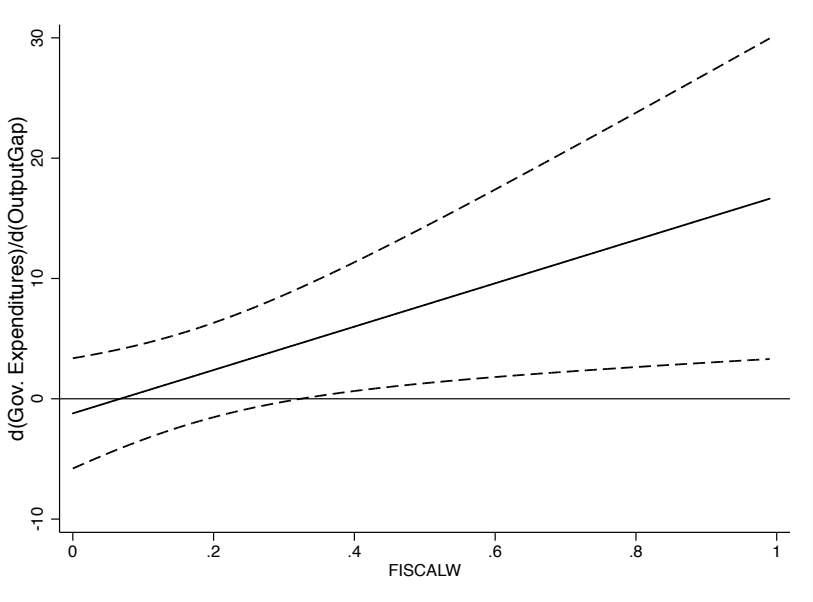


As shown by the Figure, for low values of export dependence, the marginal effect of income shocks on the fiscal balance is positive, implying that countries accumulate fiscal resources during good times, a pattern that is consistent with prudent fiscal behavior. However, as the share of oil exports in GDP increases, this marginal effect becomes negative, that is, the surplus (deficit) decreases (increases) during booms, a pattern that is consistent with procyclical fiscal policy.

Moving to the behavior of public expenditures, note that in columns 3 and 4 of Table 7, the signs of the interaction terms are positive, suggesting that as governments become more

dependent on fiscal windfalls, the response of public spending to output shocks is procyclical. Using the coefficients from Model 3, Figure 2.8 displays the marginal effect of income shocks on public spending across the range of values of Herb's rentierism variable (*FISCALW*), with 90% confidence intervals around these estimated effects.

Figure 2.8: Marginal effect of *OutputGap*, with 90% confidence interval



It is important to note that the 90% confidence interval overlaps zero for low values of fiscal windfalls, suggesting that within that range, the marginal effect of output shocks cannot be distinguished from zero statistically, and thus, implying an acyclical response of public expenditures to the business cycle in these type of countries. However, as windfalls start to explain a significant portion of total fiscal revenue, public expenditures react positively to output shocks, implying procyclical fiscal policy. These results, which are limited to 1960-2003 period, are consistent with recent research on the commodity boom (2003-2008) that suggest fiscal

policy was particularly procyclical across oil producing countries (Villafuerte and Lopez Murphy 2010; Villafuerte et al. 2010).

Conclusion

This chapter has shown that countries that are relatively more dependant on fiscal windfalls (e.g. oil, minerals) to finance public expenditures tend to lack the capacity to adapt public policy in the right direction: on average these countries show higher levels of fiscal procyclicality, which is harmful both at the aggregate level (inducing macro volatility) and in particular for the poor, who suffer the most from economic recessions. One key message of this paper is that *how* governments are financed, and in particular, how much taxes they collect, matters a lot for understanding variation in the ability of government's to adapt public policy to changing economic conditions.

This chapter provides the first reduced form empirical test of the theory presented in Chapter 1 linking the structure of public finance to spending patterns over the business cycle. Using different measures of fiscal windfalls, as well as two fiscal policy variables in a sample covering more than one hundred countries for over forty years, I exploit both cross-sectional and temporal variation in the data to show the connection between reliance on non-tax revenue sources and procyclical fiscal policy.

These facts are hard to explain with standard theories of procyclicality. First of all, the data suggests that there is more to procyclical policy than simply a credit constraint argument: fiscal policy in developing is procyclical in recessions, as well as in booms. Secondly, institutional variables do not seem such robust predictors of policy behavior when paired with the revenue structure of governments, the key explanatory variable in this chapter. Yet, fiscal

policy is hardly the outcome of purely economic events. The next chapter thus explores the connection between windfalls, fiscal policy, and elections.

Appendix 2.1: Measuring the cyclical behavior of fiscal policy

Procyclicality of fiscal policy is a common concept in the economics literature with a standard methodology. Two ways of capturing the response of fiscal policy to the business cycle have been developed. I now show the logic of each measure.

1. Correlation based measure

The first step in this work consists of the definition of the cycle for an economic variable. The methodology consists of adjusting a tendency to the evolution of the logarithm of the variables under analysis (i.e., GDP, total government expenditures). To obtain the tendency of a time series, the Hodrick-Prescott (HP) filter is frequently used, which consists of minimizing the variance of the variable of interest around its tendency. Calculating the difference between the original value of the variable's logarithm, and the logarithmic tendency estimated by the HP filter, the cyclical component is obtained. Finally, we calculate the correlation between the cyclical components of GDP and total government expenditures to establish the degree of procyclicality in each country.

2. Regression based measure

To obtain a measure of the cyclicality of fiscal policy, the following time series regression for each country *i* is estimated:

$$\Delta F_{it} = \beta_i \, OutputGap_{it} + \gamma \, TOTGap_{it} + \theta F_{it-1} + \mu_i + \varepsilon_{it}$$

The measure of procyclicality is the coefficient β where: OutputGap is defined as the log deviation of GDP from its HP trend, and TOTGap is a measure of the gap in terms of trade, weighted by the degree of openness of the economy, measured by exports plus imports over

GDP. The sign of β consistent with procyclical policy depends on the fiscal instrument or outcome of choice. When *F* is real government expenditures, a positive (negative) β coefficient indicates procyclicality (countercyclical policy). When *F* is the budget balance, a positive (negative) β coefficient indicates acyclical (procyclical fiscal policy).

Finally, note the potential endogeneity problems involved in estimating the above equation. Implicitly, we are assuming, as does most of the literature, that the causality goes from the business cycle to fiscal policy. However, reverse causality issues (e.g. output reacts to fiscal policy) could in principle be driving the results (Braun 2001; Gali and Perotti 2003). Some recent papers suggest that this possibility is actually found in the data (Rigobon 2004; Jaimovich and Panizza 2007). According to this interpretation, most of the differences across countries are due to their exposure to different type of shocks, rather than to different policy reaction functions, as assumed by most of the literature. Yet, in a more exhaustive analysis, Ilzetzki and Vegh (2008) take again the reverse causality issue to the data, and show using a battery of econometric techniques (2SLS, GMM, VAR) and different GDP instruments, that output does cause expenditure changes in developing countries, providing support to the empirical strategy followed in this chapter.

Table A2.1: Countries in the sample

Low income countries	**Middle-Low Income Countries**	**Middle-High Income Countries**	**OECD**
Angola	Algeria	Argentina	Australia
Bangladesh	Bolivia	Botswana	Austria
Benin	Cape Verde	Brazil	Belgium
Cambodia	China	Chile	Canada
Cameroon	Colombia	Costa Rica	Denmark
Cent Afr Rep.	Dominican Rep	Gabon	Finland
Chad	Ecuador	Korea	France
Comoros	Egypt	Lebanon	Germany
Congo, Rep	El Salvador	Malaysia	Greece
CÙte d'Ivoire	Guatemala	Mauritius	Ireland
Gambia	Honduras	Mexico	Italy
Ghana	Iran	Oman	Japan
Haiti	Jamaica	Panama	Netherlands
India	Jordan	Saudi Arabia	New Zealand
Indonesia	Morocco	Seychelles	Norway
Kenya	Paraguay	Trinidad Tobago	Portugal
Lao PDR	Peru	Uruguay	Spain
Madagascar	Philippines	Venezuela, Rep. Bol.	Sweden
Mali	South Africa		Switzerland
Mauritania	Sri Lanka		United Kingdom
Mongolia	Swaziland		United States
Mozambique	Syria		
Myanmar	Thailand		
Nepal	Tunisia		
Nicaragua	Turkey		
Niger			
Nigeria			
Pakistan			
Rwanda			
Senegal			
Sierra Leone			
Sudan			
Tanzania			
Togo			
Uganda			
Vietnam			
Yemen, Republic of			
Zambia			
Zimbabwe			

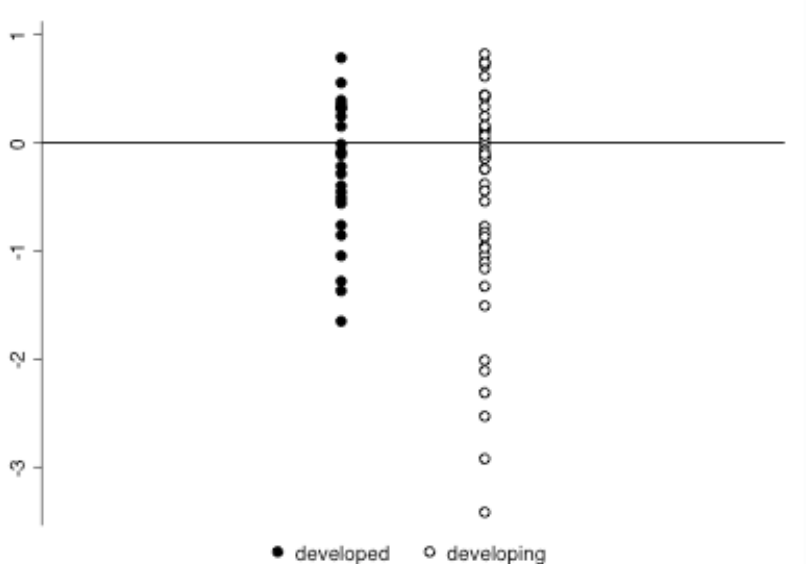
Source: Kaminsky, Reinhart, and Vegh (2004): IMF/WEO

Chapter 3. Fiscal windfalls and political budget cycles

In the previous chapter, I analyze how public spending reacts to economic conditions. There I find that countries that are relatively more dependant on non-tax revenue sources (e.g. oil, minerals) to finance public expenditures show higher levels of fiscal procyclicality. However, not only economic but also political events are likely to induce variation in a country's policy pattern. Thus, this chapter studies the behavior of fiscal policy in the proximity of elections, trying to identify interactions with the revenue foundations of democratic governments.

Just as levels of procyclicality vary markedly by income groups, it is a well-known stylized fact that *political budget cycles* (e.g. election year increases in deficits and expenditures) are a common feature in the developing world (Schunknecht 2000; Brender and Drazen 2005; Shi and Svenson 2006). As shown in Figure 3.1, the size of the fiscal deficit in electoral years in larger on average in developing than in developed democracies. This chapter seeks to explore why is this is the case.

Figure 3.1: Coefficient estimates of Electoral year on fiscal deficit in country-by-country regressions



A central empirical implication of the theory presented in Chapter 1 is that political budget cycles should be prevalent in *rentier* democracies, that is, political systems that are heavily reliant on fiscal windfalls. Thus, this chapter focuses on the role of non-tax revenue in generating electorally induced fluctuations in the budget in a sample of more than sixty democracies. In particular, it shows that the structure of public finance should be considered a key explanatory variable in accounting for politically motivated budget cycles in developing countries. This is in part a function of the fact that generating revenue from the resource sector is generally less costly for the government than extracting revenue from other sources, in particular, from the taxation of citizens. Such particular fiscal foundation alters the incentives of both politicians and voters around election times to manage expenditures and the budget balance.

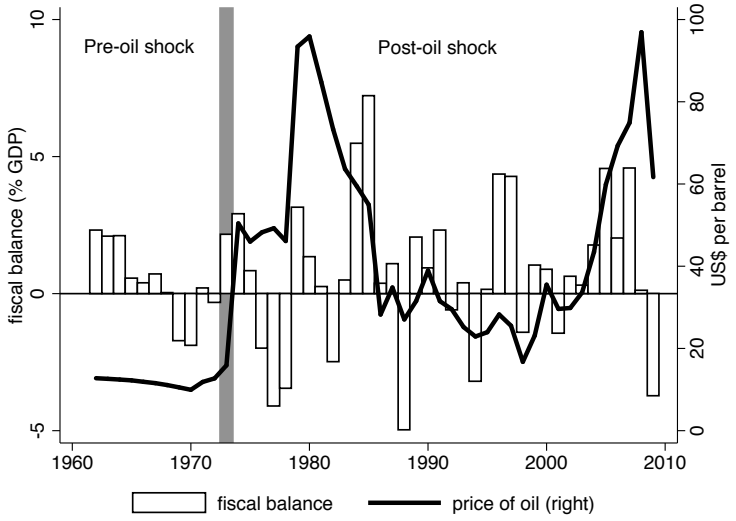
From the perspective of politicians, incumbents tend to enjoy a large share of the political benefit of spending but pay only a small fraction of the political cost of taxation. Most of the resources they spend on public goods originate from non-tax revenue sources. So we should expect these authorities to use low-cost spending power to try to remain in office. In order to understand the incentives of voters around elections, one needs to take into account the information structure of the electoral game. Building on the assumption that in low taxation environments the amount of budget information available to the public is limited, I argue that such information asymmetries leads voters to demand more of the goods they value, with elections being a key political moment to express those demands. As a result, politicians that increase expenditures or deficits in the vicinity of elections should not be punished at the polls.

In contrast, governments that are relatively less reliant on these alternative resource bases should behave differently. In order to increase expenditures, politicians in these contexts need to tax their citizens. Given that the citizens of the polity pick up the bill, politicians who engage in

fiscal profligacy should be punished out of office, providing incentives for them not to tinker with the budget around election times. Taxation then produces two effects: it raises the costs for politicians to engage in a spending binge, and secondly, provides voters with relatively more information about the extent of rent extraction on behalf of incumbents. In sum, there is an information gap characterizing electoral competition in rentier democracies, and this I argue is the mechanism that links dependence on non-tax revenue sources to political budget cycles in developing countries.

To motive the argument, consider the case of Venezuela, a typical example of a rentier democracy in the literature (Karl 1997; Dunning 2008). While Venezuela is famous for its current history of fiscal profligacy, it is perhaps less well known that fiscal policy behavior before the oil booms was quite conservative. In fact, prior to the oil shock of the 1970s, Venezuela's fiscal policy was characterized by an informal rule: governments spent what they earned (Hausmann 1992). As shown by Figure 3.2, a period of low and stable oil prices was accompanied by alternation between small fiscal surpluses and deficits. After the oil shock of the early 70s (shaded region in the Figure), the country entered a new equilibrium of volatile and large fiscal deficits, leading to the accumulation of public debt (one of the highest in the region). In line with a paradox of plenty scenario, Venezuela's debt growth was sharpest between two oil booms, rising from 9% of GDP in 1970 to more than 30% in 2004 (Puente et al. 2009).

Figure 3.2: Oil prices and the fiscal balance in Venezuela



Moreover, note that in terms of the political implications of this exogenous shock, election years became consistently associated with higher levels of fiscal deficits, something that was not common practice before the oil boom of 1974 (Kaplan 2008). To illustrate this difference, Figure 3.3 plots the level of the primary fiscal balance during electoral years, both before and after the mid 70s oil shock. In this data, the "structural break" seems relatively easy to identify.

Figure 3.3: Election years and the fiscal balance (1963-2000)

Table 3.1 presents more systematic evidence of such differences in policy outcomes. The Table shows results from a time series (1962-2006) model that follows the baseline equation estimated in standard political budget cycle studies:

$$def_t = \beta\, ELECT_t + \lambda\, w_t + \upsilon\, def_{t-1}$$

such that def_t is the government's primary budget balance as share of GDP at time *t*, *ELECT* is an election year dummy variable, and *w* a control variable, the growth rate of real GDP in year *t.*

Table 3.1: Political budget cycle in Venezuela (1962-2006)

	Pre-oil shock	Post oil shock
ELECT	0.678	-1.988*
	(0.997)	(1.013)
GDP growth	0.0865	0.103**
	(0.114)	(0.0408)
L.bal	0.547*	0.184
	(0.286)	(0.153)
Constant	-0.566	0.985*
	(0.740)	(0.531)
Observations	11	29
R-squared	0.495	0.350

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As shown in the Table, the deficit increases by 2% of GDP on average during election years after the 1973/4 oil shock. Before that exogenous shock, no political budget cycle was evident in Venezuela. The goal of this chapter is to show that these two different behaviors observed over time within a single country can also correspond to cross-national variations.

The chapter is organized as follows. The next section surveys the literature on political budget cycles and highlights the chapters' contribution to this literature. Section 2 provides empirical evidence that political budget cycles are a systematic feature of rentier democracies, and Section 3 looks at the electoral returns of fiscal policy behavior in both rentier and non-rentier democracies. Conclusions follow.

3.1 Political Budget Cycles: related literature

Political budget cycles (PBC) are changes in the level or some component of the government budget induced by the electoral calendar.[39] More specifically, the term refers to increases in government spending or the deficit or decreases in taxes (including changes relative to long-term trends) in an election year which are perceived as motivated by the incumbent's desire for re-election for himself or his party (Drazen 2008). A vast theoretical and empirical literature focuses on the relationship between elections and fiscal policy. Two particular issues have captured scholar's attention: the behavior of fiscal policy in the vicinity of elections, and the electoral returns of such strategies.

At the theoretical level, political budget cycles may arise due to moral hazard (Besley and Case 1995) or adverse selection (Rogoff and Sibert 1988; Rogoff 1990; Persson and Tabellini 2000) problems. In the former case, voters reward politicians who cut taxes or spend on goods that are valued by them, thus providing incentives for incumbents to tinker with the budget around election times. In the latter, voters try to select the most "competent" politicians through

[39] It is conceptually useful to distinguish such fiscal cycles from the more well known political *business* cycle, in which the outcome variable is economic activity (inflation, unemployment, growth). See Alesina et al (1997) and Franzese (2002) for a review of this literature.

elections, but in the absence of a priori information about politician types, incumbents may use the budget to signal their competence levels to voters.[40]

The empirical literature has explored a number of institutional conditions that make governments more likely to engage in budget manipulations in the vicinity of elections. For example, Persson and Tabellini (2002) find presidentialism to be associated with post-election fiscal adjustments (spending cuts, tax hikes and rises in surplus) and majoritarian electoral rules with pre-electoral spending cuts, while in proportional representation systems expansions of welfare spending occur both before and after elections.

In addition, the more recent literature focuses on the role of information and varying levels of voter awareness about politician's behavior to explain PBC. Brender and Drazen (2005) find a political budget cycle in a large cross-section of countries, but this fact is driven by the experience of "new democracies" in the first few years after their transition to democratic regimes. The authors argue that in these settings, fiscal manipulation may work because voters are inexperienced with electoral politics or may simply lack the information needed to evaluate fiscal manipulation that is produced in more established democracies.

Along similar lines, Shi and Svensson (2006) find that the size of political budget cycles is much larger in developing countries than in developed countries.[41] To explain such variation, they focus on two factors: politicians' rents from remaining in power (proxied by level of corruption) and the share of informed voters in the electorate (proxied by level of media access). Higher levels of corruption and a small share of informed voters imply larger deficit increases in

[40] In this setup, a competent incumbent is one that can provide higher levels of public goods for a given budget constraint.

[41] In addition to the cross-national large N studies reviewed here, PBC have been documented in a number of case studies at the national level even for autocracies (Magaloni 2006 and Gonzalez 2002 on Mexico, Blaydes 2011 on Egypt). For subnational level evidence of PBC, see Akhmedov et al. (2004) in Russia, Meloni (2009) for Argentina, and Sakurai et al (2008) on Brazil, among others.

election years for developing countries. This evidence suggests that the ability of voters to monitor economic policy is a key determinant of fiscal outcomes. Lack of budget transparency provides incentives for opportunistic politicians to incur fiscal deficits and debt accumulation, as shown by recent studies on the OECD (Alt and Lassen 2006a;b) and across American States (Alt and Lassen 2006c).

The logic of my argument draws from the recent emphasis on voter information and transparency by the literature. However, it departs from the extant scholarship in two main ways. First, I take into account a largely neglected aspect of the institutional environment: I will show that the revenue foundations of governments are a major determinant of incentives for politicians to manipulate fiscal policy around election time. Given the nature of the budget constraint they face, politicians in rentier democracies are more likely to use low cost spending power to remain in office, and thus more likely to incur in a PBC. Second, I do not take the level of information that is available to voters as exogenous but rather, derive it from the fiscal foundations of governments: non-tax or windfall revenue is intrinsically less transparent than other type of tax revenues, and thus more "stealable". Tax revenue is collected from citizens. Resource rents, on the other hand, flow directly into the public coffers, without any need for collection of private income from citizens. This information asymmetry makes rational (but uninformed) voters demand higher levels of public goods around election times and politicians ready to supply them in order to remain in power.

3.2 Evidence

3.2.1 Data

Drawing on the electoral and fiscal datasets of Brender and Drazen (2005) and Persson and Tabellini (2003), the following empirical analysis is restricted to a sample of 68 democracies over the period 1960-2001: that is, only country-years that receive a score between 0 and 10 in the Polity IV database are considered. These countries may be classified as those that were in the OECD for the entire sample period, transition economies of Eastern Europe, and all other developing democracies. I combine this data with measures of rentierism used in the previous chapter. In particular, my proxy for rentierism is an indicator variable drawn from Morrison (2009), which takes the value 1 if the government has a ratio of non-tax revenue sources to expenditures that is greater than the mean in the sample, and takes the value zero otherwise (see Table A3.1 for country classification).[42]

3.2.2 Empirical Strategy

The basic regression to be estimated in this section is of the form:

$$f_{it} = \sum b_k \, f_{it-k} + \sum c X_{it} + dELEC_t + \mu_i + \varepsilon_{it}$$

where f is an indicator of fiscal policy in country i in year t, X_{it} is a vector of control variables, $ELEC_t$ is an electoral year dummy, and μ_i is a country fixed effect.[43] The two main fiscal policy variables used as dependent variables are: 1) the fiscal balance (*bal*), defined as the difference between central government total revenue plus grants and total expenditures; and 2) total central

[42] Morrison (2009) non-tax revenue measure includes not only foreign aid and natural resource revenue attained through state-owned enterprises, but also borrowing- from abroad or the Central Bank-and all other revenue besides taxation, for example, other state-owned enterprise revenue, and so forth.

[43] Year effects were insignificant and therefore dropped from the analysis.

government expenditures (*exp*), both scaled as percentage of GDP. In addition to country fixed effects, economic control variables include real GDP per capita, the trade share, a demographic variable representing the fraction of the population aged 65+ and a measure of the output gap, as defined in the previous chapter.[44] In presenting the results, I only report the coefficient of the electoral variable for brevity, indicating whether or not there is a statistically significant political cycle. Since the inclusion of country fixed effects in an equation with lagged dependent variable introduces a potential estimation bias, to address this problem I also present GMM estimates (the Arellano-Bond estimator).

3.2.3 Baseline Results

I start the analysis by estimating the equation above for different sub-samples of democracies. As shown by Table 3.2 (columns 2 and 8), pooling all democracies together provide evidence of an electoral cycle with respect to the fiscal balance: the deficit rises in an election year by about four tenths of one percent of GDP relative to non-election years. At the same time, no political cycle with respect to government expenditures is observed with this particular cut of the data.

[44] The log difference between real GDP and its (country specific) trend, computed using the Hodrick-Prescott filter.

Table 3.2: Political budget cycles across countries 1960-2001

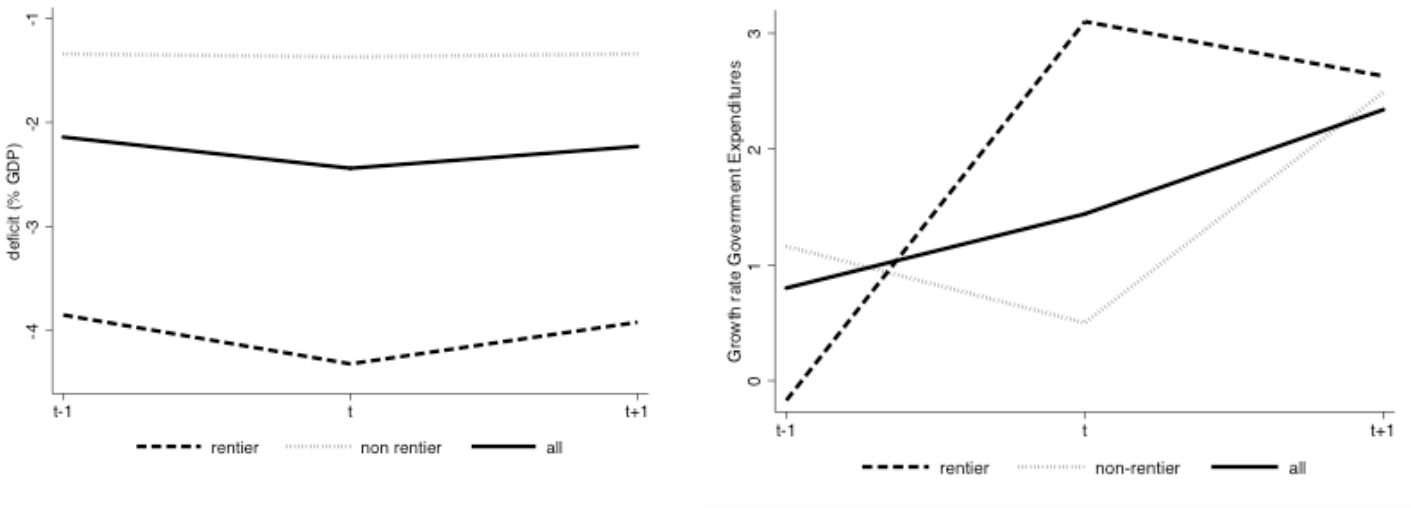
	OLS fixed effects						GMM estimates					
	All democracies		Non-rentier		Rentier		All democracies		Non-rentier		Rentier	
	exp	bal	exp	bal	exp	bal	exp	bal	exp	bal	exp	bal
	1	2	3	4	5	6	7	8	9	10	11	12
Elect	0.109	-0.404***	-0.116	-0.144	0.788*	-1.103**	0.0153	-0.402***	-0.141	-0.150	0.863**	-1.079***
	(0.132)	(0.131)	(0.139)	(0.119)	(0.403)	(0.467)	(0.154)	(0.113)	(0.185)	(0.111)	(0.337)	(0.334)
Observations	1,965	1,921	1,228	1,213	542	513	1,882	1,838	1,181	1,167	514	484
R-squared	0.676	0.460	0.691	0.629	0.679	0.272	68	68	39	39	21	21
Countries	68	68	39	39	21	21	68	68	39	39	21	21

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

However, by splitting the sample into rentier and non-rentier democracies, a different picture emerges: political budget cycles in the full sample of democracies are being driven by the experience of *rentier* democracies. Columns 5/11 and 6/12 show that election years are accompanied by both deficit and expenditure increases in these type of democracies, while no significant effects are found in countries that are more reliant on general taxation (columns 3/9 and 4/10). The estimates of column 6 and 12 suggest that the fiscal deficit as a share of GDP is about one percentage point higher during election years. Given the average fiscal deficit in the sample (2.18% of GDP), the estimate implies that on average, fiscal deficit increases by 45% in electoral years in these types of countries.

Figure 3.4 provides a graphical illustration of these results, by presenting the behavior of fiscal policy in the vicinity of elections for both rentier versus non-rentier democracies. The figures include averages across countries and periods for *t*-1; *t*; *t*+1,with *t* standing for the election year.

Figure 3.4: Behavior of fiscal policy (deficit and spending) in the vicinity of elections



The figure suggests a significant difference between the two sets of countries, with the deficit level and government spending growth in an election year being appreciably higher than in the prior and posterior years in rentier democracies (V shape patterns), while fiscal policy does not appear to be significantly different across years in non-rentier democracies. However, one could argue that the patterns described here are just another manifestation of the classical divide between developed and developing nations. As already indicated, until recently the political budget cycle was thought to be a phenomenon largely of less developed countries (Ames 1987; Schuknecht 2000). Thus, to the extent that rentier democracies are also preponderantly part of the developing world, this concern raises questions about the validity of my distinction.

To tackle this issue, Table 3.3 considers developed and less developed countries separately. Note that in contrast to our previous exercise, using this traditional dichotomy does not allow us to identify variation in the impact of elections on fiscal policy, given that both

developing and developed countries seem equally likely to engage in political budget cycles (at least with respect to the fiscal balance).[45]

Table 3.3: The PBC by level of development

	OLS fixed effects				GMM estimates			
	Develped		Developing		Develped		Developing	
	exp	balance	exp	balance	exp	balance	exp	balance
	1	2	3	4	5	6	7	8
Elect	-0.0243	-0.226*	0.239	-0.583***	-0.0562	-0.221**	0.183	-0.546***
	(0.299)	(0.119)	(0.202)	(0.196)	(0.236)	(0.111)	(0.196)	(0.192)
Observations	854	850	1,111	1,071	825	822	1,057	1,016
R-squared	0.685	0.715	0.671	0.317				
Countries	24	24	44	44	24	24	44	44

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

However, as useful as the distinction introduced here is for generating broad generalizations about the differential impact of elections on fiscal policy, the method of sample splitting used so far makes it difficult to compare my argument to alternative explanations of PBCs in a systematic way. To overcome this limitation, the next section explores the interaction effects between the sources of government revenue and the electoral calendar on fiscal outcomes.

3.2.4 Political Budget Cycles. Conditional effects

This section re-estimates the baseline equation by pooling all countries together and introducing interaction terms between the election year dummy and whether the country is a: (a) rentier democracy (RENT), (b) new democracy (NEW), or (c) presidential (PRES). Table 3.4 presents these results.

[45] Although the cycle appears stronger in the former set of countries when the variable of interest is the fiscal deficit.

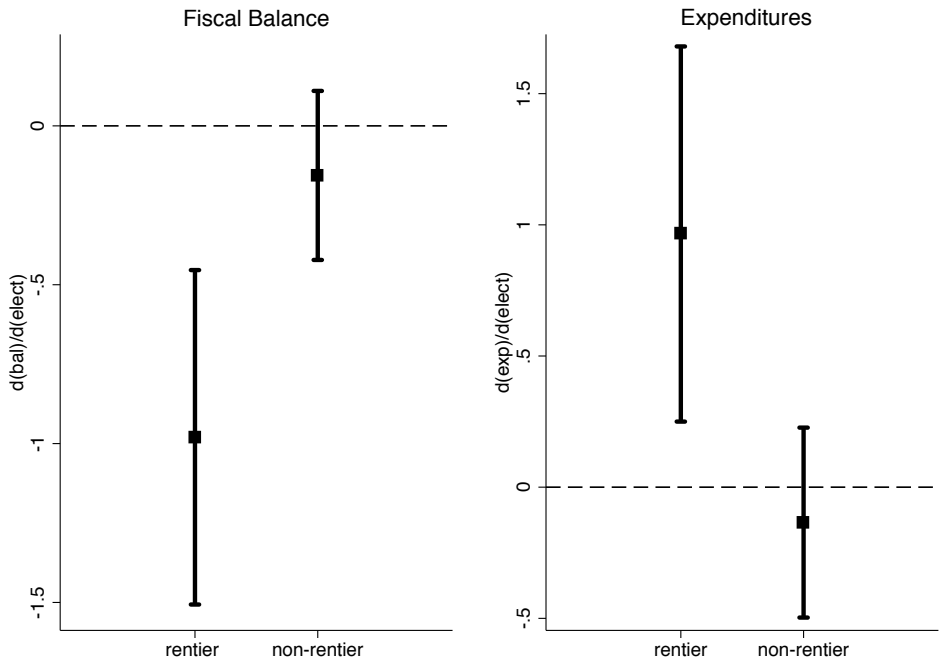
Table 3.4: PBC conditional effects

	OLS fixed effects				GMM estimates			
	exp		balance		exp		balance	
	1	2	3	4	5	6	7	8
Elect	-0.125	-0.223	-0.156	-0.0812	-0.135	-0.267	-0.187	-0.0942
	(0.216)	(0.251)	(0.136)	(0.157)	(0.185)	(0.215)	(0.128)	(0.148)
RENT x Elect	1.170**	1.033**	-0.824***	-0.570*	1.101***	1.055**	-0.694**	-0.486
	(0.475)	(0.504)	(0.301)	(0.318)	(0.409)	(0.433)	(0.287)	(0.302)
NEW x Elect		0.322		-0.924***		-0.162		-0.669**
		(0.511)		(0.323)		(0.438)		(0.307)
PRES x Elect		0.0861		0.480		0.600		0.199
		(0.476)		(0.300)		(0.413)		(0.288)
Observations	1,718	1,718	1,674	1,674	1,645	1,645	1,601	1,601
R-squared	0.690	0.691	0.531	0.534	0.690	0.691	0.531	0.534
Countries	58	58	58	58	58	58	58	58

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As shown by Table 3.4, the effects of rents on fiscal policy remain robust after conditioning on democratic experience and the form of government. This is especially true when the dependent variable is central government expenditures (columns 2 and 6) but less so in the case of the fiscal deficit (columns 4 and 8). Using the coefficients from Models 3 and 5, Figure 3.5 displays the marginal effect of elections on fiscal policy in rentier and non-rentier democracies, with 95% confidence intervals around these estimated effects. For both fiscal policy variables, the effect of elections is not statistically different from zero in non-rentier democracies, while it is robustly negative (positive) for the balance (expenditures) in rentier ones. Furthermore, in both cases the confidence intervals do not overlap, indicating that the effect of elections differs significantly between political systems with such diverse revenue foundations.

Figure 3.5: Marginal effects of elections on fiscal policy, with 95% confidence intervals



With respect to the controls, note that consistent with Brender and Drazen (2005) findings, new democracies are more likely to engage in electoral cycles with respect to the fiscal balance. The introduction of this control somewhat reduces the marginal effect of non-tax revenue on deficits (columns 4 and 8) but the effects on spending remain basically unaltered (columns 2 and 6). Finally, I do not find presidential systems to be more likely to engage in political budget cycles once we condition on the fiscal basis of governments. I now turn to explore the electoral returns (if any) that PBCs generate.

3.3 Who punishes fiscal deficits?

The seminal contribution of Peltzman (1992) gave rise to an important question on whether voters reward (behaving as fiscal liberals) or punish (as fiscal conservatives) manipulation of fiscal policy around election times. In that paper, Peltzman found that voters in the United States are less likely to support governors who increase overall expenditures before elections. While the subsequent literature has tended to corroborate Pelztam's findings at both the national (Alesina et al. 1998; Brender and Drazen 2008) and subnational levels (Brender 2003), the extant scholarship has so far ignored the country level variation induced by differences in revenue structures.[46] Thus, this subsection explores the electoral returns of fiscal policy manipulations around election times for both rentier and non-rentier democracies. In particular, I study how fiscal expansions during election years affect the probability of reelection of either incumbent candidates or parties. According to my argument, voters should punish fiscal profligacy only in countries that don't rely on fiscal windfalls as a major source of spending. To test this hypothesis, I draw on Brender and Drazen's (2008) recent study of elections and fiscal policy in a sample of 74 democracies over the period 1960-2003. The key dependent variable now is a binary variable with a value of one if the incumbent was reelected and zero otherwise. Two definitions of reelection are used: at the individual level, only observations where the leader is running for reelection are included; at the party level, observations in which a leader was substituted by another candidate from her party were added.[47]

The key independent variable is as an indicator of fiscal year expansions, the change in the ratio of the central government's fiscal balance to GDP in the election year relative to the

[46] At the subnational level, one exception is Jones et al. (2012), who study the incentives for voters to reward spending increases in Argentine provinces. Such behavior is induced by federal fiscal arrangements (large vertical imbalances) and political gaming (discretionary transfers to partisan allies).

[47] This latter definition includes the possibility that the incumbent either died before the election or could not run due to term-limits and was replaced by a party member.

previous year (BALCH_ey). To interpret results, note that the variable refers to changes in the surplus, so that a positive coefficient means that a higher surplus in election years increases the probability of reelection, or equivalently, a larger deficit reduces reelection prospects. I include two macroeconomic controls: the average growth rate of real per capita income during the leader's current term (GDPPC_gr) and the average annual rate of inflation during the leader's current term (INF). Finally, additional controls include dummies for whether countries are developed (dev) or new democracies (new).

Table 3.5 shows the effects of the fiscal balance, economic growth and inflation on the probability of reelection using a pooled logistic estimation.

Table 3.5: The effects of the budget balance on probability of reelection

	Individual sample			Party sample		
	All countries	Non-Rentier	Rentier	All countries	Non-Rentier	Rentier
	1	2	3	4	5	6
BALCH_ey	13.34*	26.52**	8.843	9.583	17.07**	3.140
	(7.430)	(10.43)	(21.41)	(6.136)	(8.289)	(13.34)
GDPPC_gr	6.999	10.73	11.05	13.36**	18.15**	20.96*
	(6.492)	(9.444)	(16.25)	(5.744)	(8.089)	(12.55)
INF	-1.486	-0.0122	-1.097	-1.989**	-1.510	-1.057
	(1.098)	(1.919)	(1.624)	(0.908)	(1.373)	(1.238)
dev	0.345	0.267	1.011	0.514*	0.520	1.200
	(0.314)	(0.478)	(1.253)	(0.270)	(0.365)	(1.250)
new	0.338	0.720	-0.680	0.369	0.928**	-0.520
	(0.373)	(0.569)	(0.705)	(0.288)	(0.409)	(0.568)
Constant	-0.304	-0.512	-0.238	-0.735**	-0.991**	-0.895
	(0.330)	(0.540)	(0.814)	(0.299)	(0.462)	(0.597)
Observations	298	201	48	408	269	77

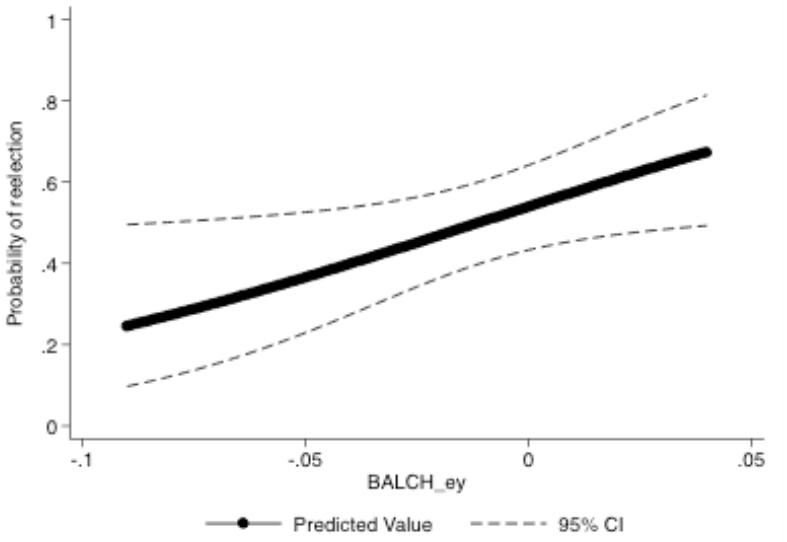
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In columns 1 and 4 the unconditional effects are shown in the individual and party samples, respectively. Looking separately at the effects of the fiscal balance on rentier and non-rentier democracies, I find that rising deficits in the election year lower the probability of reelection in non-rentier democracies (columns 2 and 5). In contrast, columns 3 and 6 show no significant effect of fiscal expansions on electoral behavior for rentier democracies. These findings suggest that even when voters in rentier countries do not reward fiscal expansions, they may be more tolerant of fiscal profligacy during election years, relative to voters in taxation environments.

As shown by Figure 3.6, the probability of reelection rises monotonically with positive changes in the fiscal balance for non-rentier democracies. In other words, voters in tax democracies are fiscal conservatives: they punish incumbent candidates or parties who engage in

budget manipulations at the polls, a result that is consistent with the lack of a PBC in such contexts.

Figure 3.6: Probability of reelection as a function of changes in the surplus



Conclusion

The results from this chapter demonstrate variation in budget outcomes according to the electoral calendar only in rentier democracies. Once we condition on the revenue structure of governments, PBCs are prevalent only on those democracies where windfalls make up a large share of the budget. In line with the expectations of the theory presented in Chapter 1, politicians in rentier democracies are more likely to engage in PBCs: the fiscal balance deteriorates and public expenditures significantly increase during election years. At the same time, voters in windfall contexts seem more tolerant of this behavior than their counterparts in taxation democracies: the latter punish incumbent candidates and parties who engage in opportunistic

manipulations in fiscal policy. So far, existing analyses have overlooked the revenue foundations of governments as a determinant of incentives for engaging in PBCs. The traditional divide between developed and developing countries is not as useful as the one proposed here to account for policy variation, given that both developed and developing countries show evidence of PBCs taking place. Thus, this chapter advances the literature on the PBC by providing a new mechanism impacting fiscal policy behavior during elections. Resource rents provide politicians with low cost spending power. At the same time, non-tax revenue dependence poses serious information challenges to voters that make them more likely to demand higher levels of public expenditures. Election times are the moment where these demands are made salient, and where the incentives of politicians and voters meet to generate a PBC.

Yet, so far in the discussion I have only assumed that lower levels of voter information characterize windfall democracies. What are the empirical counterparts of this abstract information concept? Is the low taxation-low information assumption plausible? The next two chapters answer these questions at both the cross-national and subnational levels.

Appendix 3.1

Table A3.1: Countries in the sample

Country	Rentier?	Country	Rentier?
ARGENTINA	NO	BOLIVIA	YES
AUSTRALIA	NO	BULGARIA	YES
AUSTRIA	NO	CYPRUS	YES
BELGIUM	NO	ECUADOR	YES
BRAZIL	NO	HONDURAS	YES
CANADA	NO	INDIA	YES
CHILE	NO	MADAGASCAR	YES
COLOMBIA	NO	MALAYSIA	YES
COSTA_RICA	NO	MALI	YES
CZECH_REP	NO	MEXICO	YES
DENMARK	NO	NEPAL	YES
DOMINICAN	NO	NICARAGUA	YES
EL_SALVADOR	NO	NORWAY	YES
FINLAND	NO	PAKISTAN	YES
FRANCE	NO	PANAMA	YES
GERMANY	NO	PAPUA NEW GUINEA	YES
GREECE	NO	PERU	YES
GUATEMALA	NO	ROMANIA	YES
HUNGARY	NO	RUSSIA	YES
ICELAND	NO	TURKEY	YES
IRELAND	NO	VENEZUELA	YES
ISRAEL	NO		
ITALY	NO		
JAPAN	NO		
KOREA	NO		
LUXEMBOURG	NO		
MAURITIUS	NO		
NETHERLANDS	NO		
NEW ZEALAND	NO		
PARAGUAY	NO		
POLAND	NO		
PORTUGAL	NO		
SLOVAKIA	NO		
SLOVENIA	NO		
SOUTH_AFRICA	NO		
SPAIN	NO		
SWEDEN	NO		
SWITZERLAND	NO		
TRINIDAD	NO		
UK	NO		
URUGUAY	NO		
US	NO		

Table A3.2: Variables, definitions, and sources

Variables	Definition	Sources
Fiscal policy		
Balance (bal)	The difference between Total Revenue & Grants and Total Expenditure (% of GDP	Brender and Drazen (2005)
Expenditure *(exp)*	Total Central Government Expenditure (% of GPD)	Brender and Drazen (2005)
Balance change election year (*BALCH_ey*)	The change in the ratio of the central government's fiscal balance to GDP in the election year relative to the previous year	Brender and Drazen (2008)
Election variables		
Elect	Dummy variable that receives the value 1 in the election year and 0 otherwise	Brender and Drazen (2005)
Economic controls		
Trade	The share of international trade, as a percentage of GDP	Brender and Drazen (2005)
Lgdp_pc	The log of real per-capita income	Brender and Drazen (2005)
Pop65+	The fraction of a country's population between and 65 and above	Brender and Drazen (2005)
Gdp_hp	A measure of the output gap, calculated as the difference between real GDP and its (country specific) trend. The trend was computed using the Hodrick-Prescott filter on the change in real GDP.	Brender and Drazen (2005)
GDPPC_gr	The average growth rate of real per capita income during the leader's current term	Brender and Drazen (2008)
INF	The average annual rate of inflation during the leader's current term	Brender and Drazen (2008)
Institutional controls		
PRES	Receives the value of 1 and Presidential system, and 0 otherwise	Persson and Tabellini (2003)
NEW	New democracies are those that began having competitive elections within the sample period (1960-2001). The first four elections correspond to observations coming from new democracies	Brender and Drazen (2005)

Chapter 4. Piercing the veil of the budget: the determinants of fiscal transparency

In the past few years, transparency in government activities has received considerable attention in both academic and policy circles. Defined in general as the ability of voters to observe incumbent behavior or receive information about government activities, transparency is "fast becoming the motherhood and apple pie of good governance" (Besley 2006, p. 203). For example, in theoretical models of electoral accountability, improved information forces incumbent governments to act in the best interest of voters (Ferejohn 1986; Persson and Tabelini 2000).[48] In more applied research, lack of voter information is treated as a "political market imperfection" and thus an important source of distortion in political incentives to provide high quality public services, in particular to the most vulnerable groups (Keefer and Khemani 2005).[49]

The interest in (the lack of) transparency of government activities goes far beyond academic circles. The IMF regards "lack of transparency" as a feature of the buildup to the financial crises in Mexico (1994-1995) and Asia (1997-1998) and more recently, inadequacies in Greece's budget system have contributed to its debt crisis. Prompted by these concerns, international financial institutions such as the IMF and the World Bank have developed a range of standards of "best practices" covering various economic policy areas that are now

[48] Information need not be always desirable for voters. Prat (2005) introduces a distinction between information on the consequences of the agent's actions and information directly on the agent's action. In a career concerns model, he shows that while the former is always beneficial for the principal, the latter need not. See also Besley and Smart (2007).

[49] Reinika and Svensson (2003) use a policy experiment in Uganda to illustrate how increased voter access to information can reduce misallocation of public expenditures. See Olken (2007) on the relationship between top-down monitoring and corruption in Indonesia.

internationally recognized and applied by member countries. Among these policy areas, the promotion of *fiscal transparency* in the budget process has occupied a predominant role in the quest of fostering good governance. A transparent budget process that provides the public with all relevant revenue and expenditure information in a reliable, timely, understandable, and internationally comparable manner, is regarded as key for ensuring that public officials are held accountable for managing public resources. In particular, there is a consensus that fiscal transparency is essential for informed economic decision-making (Gavazza and Lizzeri 2009), and an important precondition for maintaining fiscal discipline (Kopits and Craig 1998). Moreover, given the concerns of this project, it is useful to point out that recent studies suggest a relationship between the quality of budget institutions (with transparency being a key component) and spending patterns over the business cycle: high quality institutions (e.g. a more transparent budget process) provide better scope for conducting countercyclical policies (Dabla Norris et al. 2010).

Despite the attention that fiscal transparency has received in the last decade, empirical studies on its determinants are still quite limited (Alt et al. 2006; Andreula et al. 2009). The lack of attention to endogeneity issues in this area is even more striking when faced with the simple notion that incumbents often do not have incentives to produce the most transparent budget procedures, since doing so decreases their informational advantage over voters and fellow politicians—an advantage useful for re-election purposes. For example, by strategically manipulating information, incumbents can appear as fiscally restrained even when they are fiscally undisciplined for opportunistic reasons (Alesina and Perotti 1996).[50]

[50] Among the list of "tricks", one can include the strategic manipulation of revenue and spending forecasts, a common practice in developing countries in general (Danninger et al. 2005) and Latin America in particular (Hallerberg et al. 2009).

Given the fact that fiscal transparency does not always come about by itself, the goal of this chapter is to explore under what conditions is transparency more likely to play out in the fiscal process. In particular, I seek to test the key assumption of the theory presented in chapter 1: that the structure of public finance (where revenue comes from) affects the flow of information citizen's receives about budgets. In particular, I study whether reliance on fiscal windfalls makes it harder for voters to 'pierce the veil' of budgetary accounts and infer the true fiscal stance of the government. The main hypothesis is that levels of fiscal transparency should be affected by the source of government revenues. Based on a cross-sectional analysis encompassing 117 countries, I find empirical support for the proposition that countries that rely on windfall revenue to finance public expenditures tend to have lower levels of fiscal transparency, after controlling for a number of important economic and political fundamentals.

The main contribution of this chapter is to show the conditions under which fiscal transparency is more likely to occur. While the few previous studies on the subject have focused on institutional or political origins, I add to the list of potential determinants of fiscal transparency *the structure of public finance*: that is, where does public revenue come from? In previous chapters, I have argued that taxes and windfalls have different implications in terms of information availability. Given that windfall revenue flows directly to government coffers, without any need for collection of private income from citizens, the latter do not have a precise estimate of how much revenue the government has. At the same time, this technology of collection conspires against the dissemination of information on behalf of politicians who, given opportunistic and rent seeking incentives, have an interest in keeping the veil of the budget unpierced.

The plan of the chapter is as follows. Section 4.1 presents a basic definition of fiscal transparency and its empirical counterparts. Section 4.2 provides an overview of the literature on the consequences, and a less developed scholarship on the causes, of fiscal transparency. Section 4.3 is the core of the chapter and presents results from a cross-sectional analysis of the relationship between fiscal windfalls and transparency in more than 100 countries. The conclusion discusses the contribution of this chapter in the context of the broader dissertation project.

4.1 Fiscal transparency: definition, examples, and empirical counterparts

According to a standard definition in the literature, fiscal transparency is "openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections. It involves ready access to reliable, comprehensive, timely, understandable, and internationally comparable information on government activities so that the electorate and financial markets can accurately assess the government's financial position and the true costs and benefits of government activities, including their present and future economic and social implications." (Kopits and Craig 1998, p. 1)

To make this definition palatable, it is useful to look at examples of transparent and non-transparent practices, both in theory and in practice. A transparent budget process is one that provides clear information on all aspects of government fiscal policy, that are easily available to the public and to participants in the policymaking process, and that do present consolidated information, are transparent (Poterba and von Hagen, 1999, pp. 3–4). On the contrary, budgets that include numerous special accounts and that fail to consolidate all fiscal activity into a single 'bottom line' measure are not transparent. A budget process that is not transparent tends to be

characterized by two common practices: a) *hidden budgeting*, a situation where the real budget is known only to a selected few, thus facilitating the misappropriation of funds and increasing the scope for mis-governance, and b) *enclave budgeting,* whereby certain spending programs and projects are protected by the establishment of special funds outside the purview of the annual budget and public scrutiny (Schick 1998).

An example of the latter is the National Development Fund (FONDEN), an off-budget fund that finance development projects and is controlled by the President in Venezuela with high levels of discretion. The fund resources come from two main sources: a) the oil windfall contribution paid by PDVSA, the national oil company[51]; and b) from the central bank's international reserves, when they exceed a certain legally set level considered 'sufficient'.[52] In addition, a second off-budget mechanism that has been increasingly used by the current administration is to make PDVSA directly spend on social and infrastructure programs, such as food production and subsidized food distribution, investments in electricity, transportation, infrastructure and housing, and social and educational programs. During the recent oil boom (2003-2008), total *off-budget* expenditures, including FONDEN and direct social expenditures, amounted to the very significant total of US$66.2 billion (Manzano et al. 2011). Only in 2008, just before the drop in international oil prices, FONDEN accumulated resources amounting to US$14 billion, a figure equivalent to 15% of the national budget approved by the legislature in December 2007.[53]

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[51] The *windfall special contribution* operates as a surcharge royalty of 50 per cent for revenues above a price of US$70 per barrel, which rises to 60 per cent if the price goes above US$100.

[52] The methodology for the determination of the "optimal" level of international reserves is not public information, it is only known by the members of the Board of Governors of the Central Bank.

[53] One could argue that the budget approved by the legislature is usually not the right metric of comparison since the Executive strategically under-estimates revenues at the preparation stage of the budget in order to execute a greater budget without legislative approval when revenues end up being "unexpectedly" high.

The contemporaneous case of Venezuela is neither an exception in terms of budget practices around the world nor an anomaly when placed against the backdrop of Venezuela's fiscal history.[54] It is well understood that countries that derive a significant share of revenues from natural resources (e.g. oil) or aid face a unique set of transparency problems, arising from the technical complexity and volatility of resource revenue flows, as well as from the sheer magnitude of such transactions (IMF 2010). Similarly, flows of donor aid are often not fully integrated with the budget (Gupta et al. 2008). In such contexts, I argue that it is easier for less-than-benevolent politicians to divert part of the fiscal windfall for private uses, given the informational rents generated by the collection technology.

However, in order to place the Venezuela example in comparative perspective, one needs aggregate indicators that assess among other things, whether budget documents are "comprehensive" (does the annual budget approved by the legislature include all government expenditures?) and whether they cover extra-budgetary funds and activities or not. Internationally comparable indexes of fiscal transparency do just that. In recent years, several indexes have been developed by academics, financial institutions, and NGO's to assess the degree of transparency of the budget process from a comparative perspective (Andreula et al. 2009; Hammed 2005; IBP 2010). All of them build from benchmarks developed by either the IMF or OECD in their respective codes of good practices on fiscal transparency.[55] Data is

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[54] In the middle of the oil boom in the 1970s, the government of Carlos Andres Perez created the Venezuelan Investment Fund (FIV), to which significant off-budget resources were channeled (Manzano et al. 2011).

[55] See the IMF's *Code of Good Practices on Fiscal Transparency* and the accompanying *Manual of Fiscal Transparency that* explain the various dimensions against which transparency may be measured. See also OECD's *Best Practices for Budget Transparency*.

compiled from questionnaires or reports[56] that evaluate actual budget procedures against these standards in order to construct an internationally comparable measure of fiscal transparency. In the empirical analysis that follows in section 4, I rely in part on the 2010 fiscal transparency index developed by the *International Budget Partnership* (IBP) through its *Open Budget Survey*. This index is not only the most recent one available but it's also the most comprehensive in terms of coverage (n=94) including a diverse sample over a range of geographic locations, development stages, and political institutions.[57] The questionnaire in the Open Budget Survey inquires about the public availability, timeliness, and comprehensiveness of a country's budget reports during the different phases of the budget making process (preparation, approval, execution, control). However, before delving into the empirical analysis and use of the index, it is useful to briefly review findings from the extant scholarship on fiscal transparency in order to place this chapter's contribution in context.

4.2 Related literature

The study of fiscal transparency is rooted in a well-established body of theoretical and empirical research on the institutional determinants of fiscal outcomes (Alesina and Perotti 1995; Poterba and von Hagen 1999). At the theoretical level, fiscal transparency (or the lack thereof) is modeled in the context of the agency problem: that is, information asymmetries between the government and voters or within the government hierarchy, which can influence the size and allocation of public resources (Besley 2006; Besley and Smart 2007; Gavazza and Lizzeri 2009; Shi and Svensson 2006). At the empirical level, fiscal transparency is a key component in

[56] See for example the IMF's Reports on the Observance of Standards and Codes (ROSCs) http://www.imf.org/external/NP/rosc/rosc.aspx

[57] Other indexes in the literature are either regionally focused (Alt and Lasssen 2006 on OECD, Alesina et al 1999 on Latin America, Jarmuzeck et al (2009) on Eastern Europe, or include a smaller n (Hameed 2005; Andreula et al 2009).

broader indexes relating the overall quality of *budget institutions* to fiscal discipline: budget deficits and public debt are significantly lower in countries that posses "hierarchical" (top-down) procedures that impose a hard budget constraint and a greater level of budgetary transparency (Alesina et al. 1999; von Hagen and Harden 1994).

More recent studies suggest specific channels linking transparency to fiscal performance. Milesi-Ferreti (2003) explore the relationship between transparency and the effectiveness of numerical fiscal rules, that is, laws which establish ex ante constraints on deficits such as those imposed by members of the European Union under the Maastricht Treaty of the 1990s. In his model, fiscal transparency affects politicians' responses to fiscal rules: under high transparency, rules induce politicians to make the real fiscal adjustments needed to bring the budget into balance, while under low transparency such rules simply encourage "creative accounting."

In the political agency models of Shi and Svensson (2006) and Alt and Lassen (2006a; 2006b), voters want more "competent" politicians in office, however this creates incentives for incumbent to try to appear competent by issuing debt, even when they are not. Transparency determines the extent to which voters can observe debt before deciding whether to reelect the incumbent or not, and thus, the scope for engaging in opportunistic electoral cycles. Using a sample of 19 OECD countries during the 1990s, Alt and Lassen find that electoral cycles in fiscal policy are prevalent in lower transparency countries (Alt and Lassen 2006a) and that deficits and debt are lower the higher the level of fiscal transparency (Alt and Lassen 2006b).

Alt et al. (2002) build on Ferejohn's (1999) political agency framework to study the impact of fiscal transparency on the size of government in the American states. Ferejohn (1999) presents a principal-agent model of retrospective voting in which political agents can choose to make their actions more transparent to voters and thus more controllable in order to attract more

resources and support. The key result is that there are circumstances in which more transparency can make the agent (and the principal) better off. The intuition of the model is that there are equilibria in which more transparency produces lower uncertainty about the sort of actions taken by a political incumbent, thus more voter confidence in the incumbent (or in voters' ability to distinguish good performance from bad performance), and as a result, higher investment in the agency relationship, that is, principals entrusting greater resources to politicians. Using cross-section data for 1986-1995 for the American states, Alt et al. (2002) find support for some of these propositions, as their subnational index of fiscal transparency is positively correlated with total government expenditures and gubernatorial popularity.

Finally, several recent papers explore the direct relationship between transparency and fiscal outcomes using relatively large N samples. For instance, Hameed (2005) develops an index of fiscal transparency based on IMF reports on the adherence to the *Code of Good Practices on Fiscal Transparency* and shows that, for a broad range of countries, higher transparency is associated with more fiscal discipline (lower deficits), better credit ratings, and lower levels corruption. Jarmuzek (2006) assesses the role of fiscal transparency in establishing better fiscal discipline in sample of 27 transition economies: he finds a negative, although weak, relationship between fiscal transparency and debt accumulation.

While there exists a fairly large literature on the effects of fiscal transparency, very little work considers the endogeneity of such institutions. Two recent exceptions are Alt et al. (2006) and Andreula et al. (2009). In the first, the question motivating the analysis is the same as in this chapter: under what circumstances will politicians implement more transparent budget procedures? Based on an original index of budget practices in the American states from 1972 to 2002, Alt et al (2006) find that robust political competition is a significant predictor of reforms

aimed at improving fiscal transparency. The logic presented is simple: when two parties compete for office and the risk of replacement is sufficiently large, the incumbent may choose to increase transparency (and therefore lose the informational advantages afforded by a low transparency regime) and tie its own hands, but also those of her potential successor. Additionally, the authors find that polarization works in the opposite direction as political competition: polarization is associated with lower transparency, which could suggest that bipartisan cooperation on increasing transparency is only possible when parties are not too distant from each other. In the empirical analysis that follows, I build on this literature mostly to control for the political determinants of fiscal transparency.

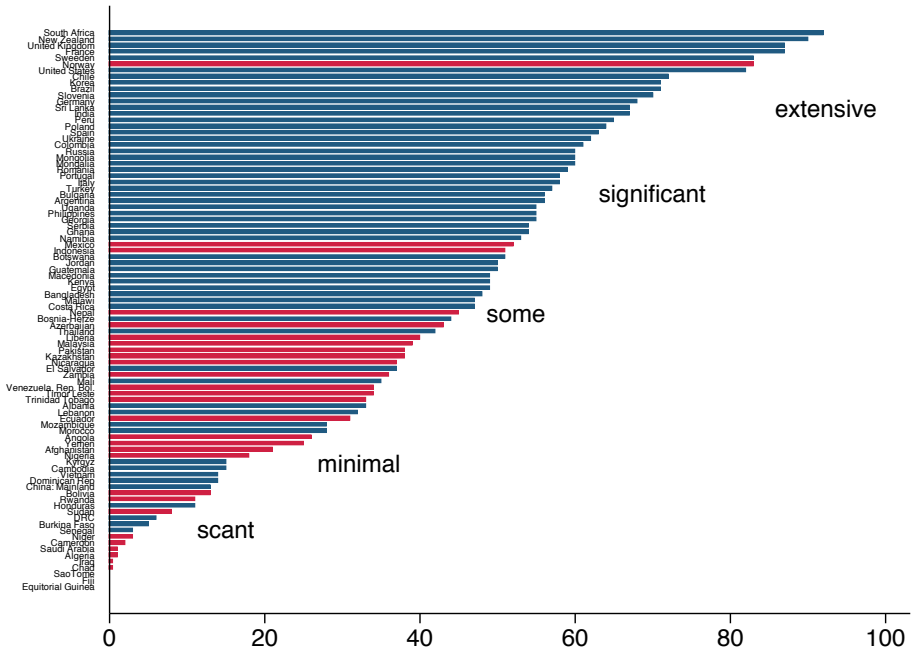
4.3 Empirical analysis

Data. The sample is restricted by the availability of fiscal transparency data. As noted in section 2, I draw on the 2010 fiscal transparency index developed by the *International Budget Partnership* (IBP) through its *Open Budget Survey* to measure the dependent variable. The questionnaire in the Open Budget Survey inquires about the public availability, timeliness, and comprehensiveness of a country's budget reports during the different phases of the budget making process (preparation, approval, execution, control). It is available for 94 countries and spans a diverse sample including variation in political institutions, five geographic regions, and all stages of economic development.

Figure 4.1 shows the distribution of transparency scores in the full sample, countries marked in red are the ones considered by the IMF hydrocarbon-rich countries between 2000 and 2005 and satisfy the following criteria: (i) an average share of hydrocarbon and/or mineral fiscal revenues in total fiscal revenue of at least 25% or (ii) an average share of hydrocarbon and/or

mineral export proceeds in total export proceeds of at least 25% (IMF 2007). Countries are ranked by their level of transparency (0-100 index) along with categories developed by IBP on how much information is reported through the different stage of the budget process: extensive (81-100), some (61-80), minimal (21-40), scant (0-20).

Figure 4.1: Fiscal transparency scores in ninety-four countries



While there is one resource riche country (Norway) that provides "extensive" budget information, most of the countries characterized by natural resource wealth tend to scatter toward the lower part of the graph and on average, report between "minimal" or "scant" levels of information. For example, among the ten countries with the lowest transparency scores in the sample, seven are rich in hydrocarbons. In the analysis that follows, I study whether this negative relationship between fiscal windfalls and transparency is robust to a number of specifications and the inclusion of a battery of economic and political fundamentals.

Measuring fiscal windfalls. The key independent variable in this chapter is government's access to fiscal windfalls. To proxy for this concept, I use two measures: a) the share of fuel exports in total merchandise exports (*FUELX*) between 1990 and 2009, drawing on the World Development Indicators, and b) a dummy variable indicating whether the country's average share of hydrocarbon and/or mineral fiscal revenues in total fiscal revenue is at least 25 percent between 2000 and 2005 (*FISCALW*), drawing on the IMF's *Guide on Resource Revenue Transparency*. As shown by Table A4.1 (Appendix), there is considerable variation in the extent to which countries have access to these resources.

Controls. Based on previous analysis on the determinants of fiscal transparency (Alt et al. 2006c; Andreula et al. 2009), the baseline specifications include the following controls (see Table A4.1 for summary of variables of data sources). All the explanatory variables are expressed as an average for the period 1990-2009 (for available years):

- **GDP per capita**, in log (*LYP*). Richer countries can afford better informational systems, and they might have greater incentives to publicize their fiscal results.

- Two **demographic** variables most likely to affect electorate's overall awareness to information: percentage of population living in urban areas, *URBAN*, and the percentage of people aged between 14 and 65, *AGE.*

- To control for **geography**, I use four dummy variables for continental location. They refer to countries in Africa (*AFRICA*), eastern and southern Asia (*ASIAE*), Latin America and the Caribbean (*LATAM)*, Middle East and North Africa (*MENA*), and the *OECD* (the default group consists of non-0ECD countries in Europe).

- **Quality of institutions**. Scholars usually draw on the governance indicators developed by the World Bank to measure institutional quality contemporaneously.[58] Combining both large opinion surveys and measures based on polls of experts, governance is proxied by clusters of variables such as voice and accountability (*Voice&Account*), government effectiveness (*GovEff*), rule of law (*RuLaw*) and control of corruption (*ContrCorrupt*). The problem with using these variables in the current context is that such measures are often endogenous to more structural determinants that appear on the right hand side of the specifications. As shown by Table A4.2 (Appendix), with the exception of one indicator, the rest of the governance indicators are significantly negatively affected by the windfall variables.

To remedy this problem, I rely on deeper determinants of institutional quality in the analysis: legal origins (La Porta et al. 1998) and levels of settler mortality (Acemoglu et al. 2001). La Porta et al. (1998) use legal system origins to estimate the quality of institutions, by classifying each country in one out of five categories according to its commercial legal tradition: common law (*LO_uk*), German civil law (*LO_ge*), Scandinavian law (*LO_sc*), socialist law (*LO_so*), and French civil law, the omitted category in this analysis. The settler mortality figures are entered in logs (*log SM*).

- **Democracy**. Based on the polity2 scores (POLITY), I control for the effects that the regime type may exert on government incentives to provide fiscal information and the fact that democracies tend to be more transparent than non-democracies (Hollyer et al. 2011).

- **Political competition and polarization**. Drawing on the 2010 Database of Political Institutions, I use two proxies of political competition: the fraction of seats held by the government party in the legislature (GOVSEATS) and a measure of fractionalization capturing the probability that two deputies picked at random from among the government parties will be of

[58] See Kaufmann, Kraay and Zoido-Lobatón (2003).

different parties (GOVFRAC). As a measure political polarization, we rely on the policy distance, or the maximum difference between the chief executive's party's position and the values of the three largest government parties and the largest opposition party (POLAR).

Results. Table 4.1 presents results from simple OLS estimations with the fuel export variable as proxy for windfall revenue. Column 1 is the baseline regression including only economic determinants of transparency, Columns 2 and 3 introduce historical determinants of institutional development, and Columns 4-7 include measures of the political regime and other political variables.

Table 4.1: Determinants of fiscal transparency 1 (OLS)

	1	2	3	4	5	6	7
FUELX	-0.219***	-0.236***	-0.295***	-0.149*	-0.226***	-0.237***	-0.185**
	(0.0591)	(0.0675)	(0.105)	(0.0776)	(0.0642)	(0.0698)	(0.0722)
LYP	4.007	-0.375	1.671	-1.674	1.189	-0.620	-3.091
	(3.111)	(3.341)	(7.446)	(3.125)	(3.135)	(3.365)	(3.512)
AGE	0.818	1.251	2.554*	1.056	1.193	1.573*	1.749**
	(0.776)	(0.810)	(1.354)	(0.807)	(0.817)	(0.856)	(0.801)
URBAN	0.153	0.254*	0.156	0.222*	0.217*	0.225	0.257*
	(0.120)	(0.134)	(0.169)	(0.130)	(0.123)	(0.136)	(0.130)
OECD	10.58	0.994	20.41	5.312	10.64	6.016	2.979
	(8.648)	(10.82)	(20.35)	(8.685)	(9.728)	(10.12)	(9.515)
AFRICA	2.455	-12.50	22.79	-4.865	7.347	-5.230	-11.79
	(10.68)	(13.92)	(17.75)	(11.10)	(13.44)	(13.48)	(12.85)
ASIAE	-0.611	-14.84	14.79	-8.996	-0.889	-9.414	-14.91
	(7.368)	(9.938)	(16.09)	(7.146)	(9.210)	(9.458)	(9.533)
LATAM	-5.335	-11.54	5.909	-9.173	-1.719	-5.701	-11.58
	(7.155)	(10.73)	(14.55)	(8.490)	(9.863)	(9.996)	(9.657)
MENA	-13.95	-21.02		-5.676	-0.985	-14.53	-18.91*
	(9.411)	(12.99)		(13.45)	(13.36)	(12.37)	(11.18)
LO_uk		13.83**		13.01**	12.57**	13.01**	16.21***
		(5.584)		(5.278)	(5.334)	(5.596)	(5.258)
LO_so		-9.472		-1.671	3.965	-4.145	-5.765
		(9.087)		(7.717)	(7.975)	(8.297)	(7.995)
LO_ge		4.975		6.504	1.415	3.298	5.038
		(8.709)		(9.291)	(7.884)	(8.539)	(8.076)
LO_sc		22.23***		20.07***	17.01**	22.54***	24.02***
		(8.153)		(7.250)	(7.546)	(8.297)	(7.768)
Log SM			-1.409				
			(4.097)				
POLITY				1.479***			
				(0.548)			
GOVSEATS					-35.44**		
					(14.72)		
POLAR						0.0117**	
						(0.00549)	
GOVFRAC							0.0483**
							(0.0189)
Constant	-38.39	-30.56	-128.2**	-21.50	-28.76	-51.98	-40.40
	(40.67)	(43.69)	(57.80)	(41.25)	(44.99)	(45.24)	(41.99)
Observations	88	86	39	85	85	85	85
R-squared	0.508	0.571	0.561	0.606	0.600	0.579	0.626

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Consistent with the working assumption developed in chapter 1, budget processes in countries with higher shares of fuel exports as a share of total merchandise exports tend to be significantly

less transparent. Depending on the specification, a 10% increase in the share of fuel exports is associated with 1.5-3 point reduction in levels of fiscal transparency on average. With respect to the controls, it is worth noting that in line with previous studies, I find that political competition, institutional quality (legal origins), and levels of democracy (polity scores) are significant determinants of fiscal transparency (Alt et al 2006c; Andreula et al. 2009; Hollyer et al. 2011). Figure 4.2 shows the negative partial correlation between fuel exports and fiscal transparency after controlling for levels of economic development, geographic location and legal origins.

Figure 4.2: Fiscal windfalls and transparency (residuals plot)

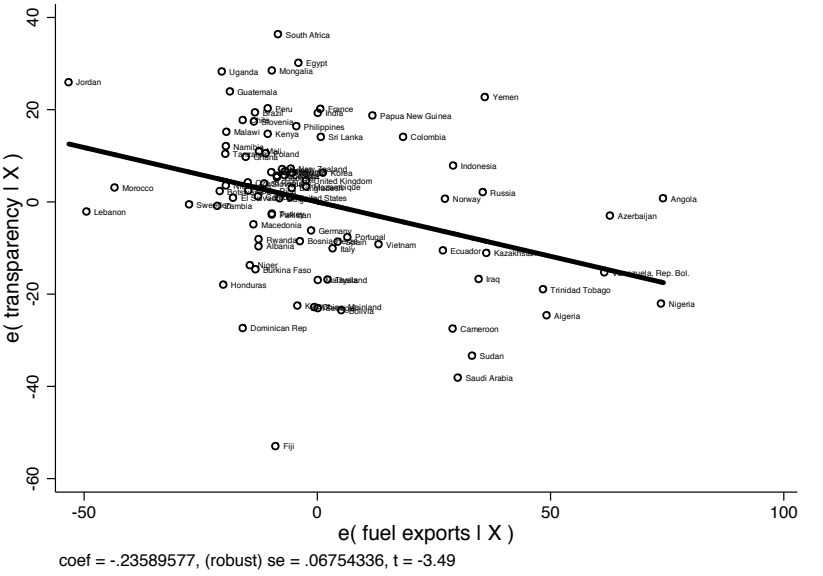


Table 4.2 replicates the exercise from the previous Table using a more direct proxy of fiscal windfalls: the indicator variable telling whether the country's average share of hydrocarbon and/or mineral fiscal revenues in total fiscal revenue is at least 25% (FISCALW).

Table 4.2. Determinants of fiscal transparency 2 (OLS)

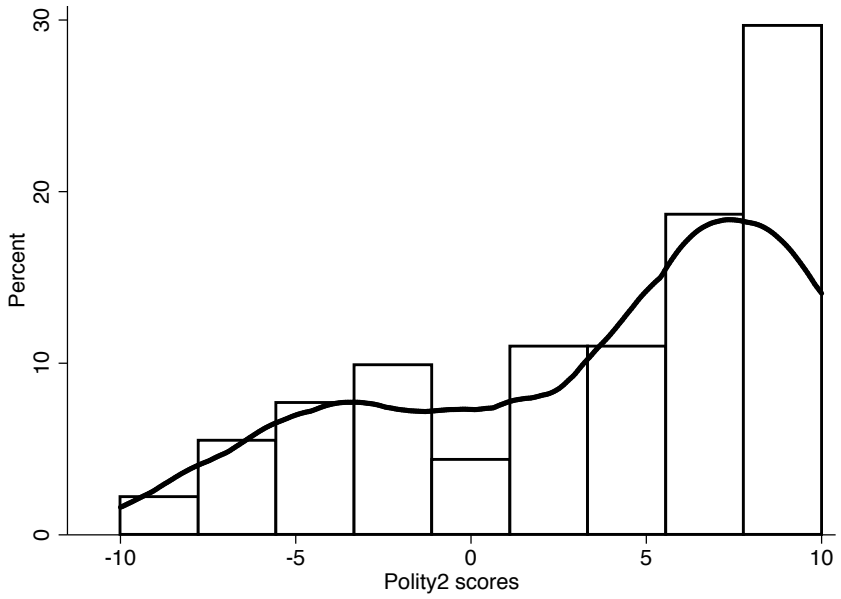
	1	2	3	4	5	6	7
FISCALW	-18.83***	-16.03***	-18.39***	-9.234*	-15.85***	-16.69***	-12.47***
	(4.209)	(4.297)	(5.587)	(5.435)	(4.182)	(4.328)	(4.607)
LYP	2.343	-0.459	2.146	-1.393	1.453	-0.723	-4.114
	(2.876)	(2.856)	(6.969)	(2.578)	(2.828)	(2.867)	(3.353)
AGE	1.107	1.381*	2.678*	1.095	1.318	1.736**	1.931**
	(0.777)	(0.803)	(1.358)	(0.796)	(0.814)	(0.842)	(0.785)
URBAN	0.163	0.225*	0.106	0.195	0.177	0.194	0.263**
	(0.109)	(0.118)	(0.185)	(0.118)	(0.110)	(0.119)	(0.112)
OECD	13.92*	4.077	29.06	7.105	13.99	9.930	8.348
	(8.278)	(10.51)	(18.19)	(8.364)	(9.610)	(9.216)	(8.472)
AFRICA	3.029	-11.36	26.60	-3.967	9.643	-2.787	-8.236
	(10.83)	(14.07)	(16.94)	(10.97)	(13.53)	(12.86)	(11.93)
ASIAE	2.055	-11.27	22.97	-6.260	3.699	-4.807	-10.75
	(7.568)	(10.16)	(14.39)	(7.196)	(9.329)	(8.696)	(8.687)
LATAM	-0.976	-8.187	13.08	-6.970	2.292	-1.298	-7.276
	(7.182)	(10.81)	(12.19)	(8.700)	(9.941)	(9.328)	(8.524)
MENA	-12.01	-21.08		-5.093	0.00340	-13.33	-18.12*
	(9.137)	(12.87)		(13.01)	(12.92)	(11.37)	(10.07)
LO_uk		12.78**		12.46**	11.05**	11.80**	14.55***
		(5.325)		(4.901)	(5.143)	(5.303)	(4.970)
LO_so		-8.871		-0.539	5.295	-2.730	-5.614
		(9.312)		(8.003)	(8.402)	(7.788)	(6.982)
LO_ge		3.961		5.859	-0.147	1.986	4.326
		(8.579)		(9.050)	(7.938)	(8.387)	(8.100)
LO_sc		15.77***		15.82***	10.42	16.04***	19.16***
		(5.416)		(5.549)	(6.603)	(5.680)	(6.037)
Log SM			-0.302				
			(4.151)				
POLITY				1.545***			
				(0.563)			
GOVSEATS					-35.43**		
					(15.83)		
POLAR						0.0120**	
						(0.00535)	
GOVFRAC							0.0394**
							(0.0160)
Constant	-47.05	-39.60	-149.3**	-27.49	-39.99	-63.59	-48.15
	(42.13)	(44.77)	(55.30)	(41.45)	(45.65)	(45.47)	(41.82)
Observations	92	90	40	89	89	89	89
R-squared	0.548	0.599	0.571	0.635	0.631	0.612	0.649

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results are consistent with previous findings: levels of fiscal transparency are on average between 9 and 19 percentage points lower in countries where windfall revenue explains a significant part of total fiscal resources. The economic significance of windfalls is only matched by the Scandinavian legal origins variable, and to a lesser extent, a Common law tradition.

Robustness checks. While previous exercises control for the level of democracy, one could argue the approach of pooling democratic and non-democratic regimes in the sample may obscure as much as it clarifies the argument in the sense that the results we observe could be driven by the presence of non-democratic regimes who are almost by definition non-transparent. As shown by Figure 4.3, however, the sample used so far is not particularly biased against democracy, when measured using polity scores for the period under analysis.

Figure 4.3: Distribution of polity scores in the IBP sample



Moreover, the regressions in Tables 4.3 restrict the sample to countries with strictly positive polity2 scores (Columns 1-3), and to "strong" democracies, that is, countries whose polity2 scores are at least 6 (Columns 4-6). In this exercise, I control for the form of government

by introducing a dummy variable for presidential regimes.[59] The introduction of this variable is theoretically justified by the logic of separation of powers under presidential regimes: when decision-making authority over spending and taxation is assigned to different government bodies (e.g. checks and balances), voters should in principle be able to discipline politicians and push down the level of rent extraction (Persson, Roland, and Tabellini 1997; 2000). The implication of this argument in the current setup is that presidential systems should have, ceteris paribus, more transparent budget procedures. Even after controlling for this type of formal political institution, the results show that variation in fiscal windfalls can explain levels of transparency *across* democratic regimes, with the "effects" being even stronger in the most robust democracies.

[59] A country is coded as presidential if the confidence requirement is not necessary for the executive to stay in office. See Persson and Tabellini for country classifications (2003).

Table 4.3: Determinants of fiscal transparency across democracies (OLS)

	Polity > 0			Polity2 >=6		
	1	2	3	4	5	6
FUELX	-0.203**	-0.214**	-0.215**	-0.268***	-0.277**	-0.268**
	(0.100)	(0.103)	(0.0944)	(0.0957)	(0.100)	(0.0978)
LYP	-1.325	-0.843	-2.326	1.940	2.631	1.915
	(3.521)	(3.641)	(3.892)	(4.051)	(4.294)	(4.144)
AGE	2.155**	2.074**	2.209**	1.646	1.481	1.642
	(0.975)	(0.993)	(0.964)	(1.107)	(1.157)	(1.125)
URBAN	0.304**	0.315**	0.307**	0.412***	0.430***	0.415***
	(0.143)	(0.140)	(0.140)	(0.118)	(0.112)	(0.124)
LO_uk	15.23***	14.32***	16.63***	17.16***	16.12***	17.14***
	(5.045)	(4.823)	(5.296)	(5.502)	(5.630)	(5.604)
LO_so	-0.275	2.202	-1.543	-7.155	-4.370	-7.260
	(6.452)	(7.574)	(5.650)	(6.899)	(6.645)	(7.183)
LO_ge	-1.675	-2.918	-1.519	-11.29	-12.15	-11.28
	(6.902)	(7.365)	(6.888)	(10.50)	(11.29)	(10.67)
LO_sc	23.66***	21.43**	25.06***	21.05*	18.46	21.02*
	(8.782)	(9.162)	(9.215)	(10.81)	(11.31)	(11.04)
OECD	10.70	11.80	8.061	-3.906	-2.837	-3.758
	(9.789)	(10.02)	(8.464)	(8.398)	(7.912)	(8.636)
AFRICA	3.910	9.323	0.591	3.424	8.902	3.540
	(15.90)	(17.45)	(15.62)	(16.77)	(17.61)	(17.08)
ASIAE	-2.757	0.549	-4.942	9.320	12.78	9.563
	(8.998)	(10.99)	(9.203)	(9.504)	(9.961)	(9.866)
LATAM	-3.162	-1.245	-6.355	-6.998	-4.608	-6.769
	(10.78)	(11.50)	(10.26)	(8.637)	(7.622)	(8.900)
MENA	-23.18**	-20.05**	-18.24	-37.72***	-34.84***	-38.63***
	(8.817)	(9.718)	(11.38)	(6.821)	(5.981)	(11.55)
PRES	6.173	4.921	5.721	-0.107	-1.882	-0.262
	(5.271)	(6.038)	(4.950)	(5.311)	(5.636)	(5.687)
GOVSEATS		-15.34			-14.93	
		(22.89)			(18.78)	
GOVFRAC			0.0418			-0.00476
			(0.0481)			(0.0442)
Constant	-95.52*	-87.70*	-87.29*	-85.70	-75.05	-85.53
	(49.55)	(51.60)	(49.50)	(56.75)	(59.66)	(57.72)
Observations	64	64	64	42	42	42
R-squared	0.591	0.594	0.612	0.763	0.766	0.763

Robust standard errors in parentheses

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

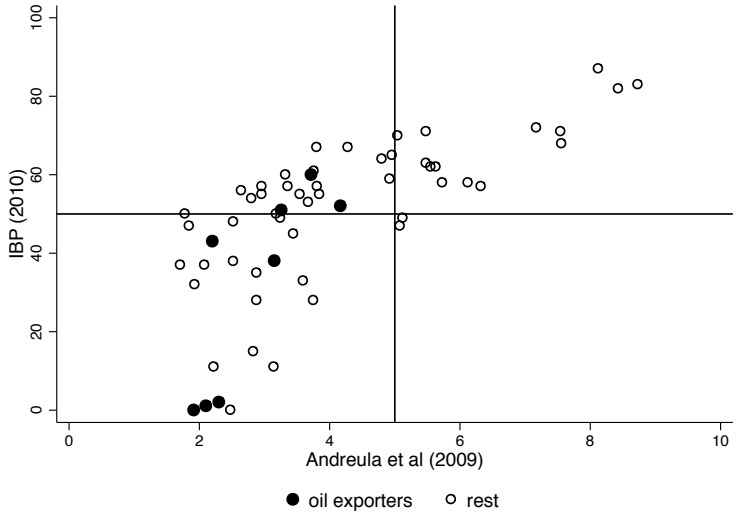
Are these results specific to the transparency index of choice? To answer this question, I draw on Andreula et al. (2009) measure of fiscal transparency, which after the IBP index used so far, has the largest country coverage (n=82). This index is constructed by translating into numerical values the qualitative information presented in 82 countries' *Reports on the Observance of Standards and Codes* (ROSCs), issued by the IMF along three dimensions: 1) clarity and assurances of information, roles and responsibility; 2) open budget preparation, and 3) public availability of information.[60]

The first dimension evaluates how each country adheres to the following principles: "the government sector should be distinguished from the rest of the public sector; there should be an open legal, regulatory and administrative framework for fiscal management; fiscal data should meet accepted data quality standards; fiscal activities should be subject to effective internal oversight and safeguards; fiscal information should be externally scrutinized." (IMF 2007). The second dimension is a proxy that measures how clear national procedures are for budget execution, monitoring and reporting, as well as rating how much budget preparation follows an established timetable and is guided by well-defined macroeconomic and fiscal policy objectives. Lastly, the third dimension evaluates the extent to which in every country the public is provided with comprehensive information on past, current and projected fiscal activity and on all major risk, and if a commitment is made to timely publications (Andreula et al. 2009).

As shown in Figure 4.4, there is a fair amount of correspondence between the two measures of fiscal transparency: the pairwise correlation in the 58 countries for which both indicators are available is .71. Moreover, notice that none of the hydrocarbon-rich countries (oil exporters in the figure) for which data is available appear in the upper right hand quadrant of the figure, that is, the cluster of the relatively more transparent systems.

[60] See Table A4.3 (Appendix) for fiscal transparency data in both samples.

Figure 4.4: Indexes of fiscal transparency compared



Tables 4.4 and 4.5 present results from regressing the Andreula et al. index on our main variables of interest: fuel exports and fiscal dependence, respectively. Depending on the specification, Table 4 shows that a 10% increase in fuel exports as a share of total exports can produce up to a 2.3-point reduction in the fiscal transparency (a variable ranging from 0 to 10), and according to Table 5, the budget processes in countries characterized by fiscal dependence on natural resources tend to score around 10 points lower than other types of countries in terms of transparency. With respect to the political controls, some of the variables like levels of democracy and political competition, which in the IBP sample were found to be robust determinants of transparency, have less explanatory power in this context. In sum, both Tables confirm that the relationship between fiscal windfalls and transparency is not an artifact of the sample or fiscal index of choice.

Table 4.4: Determinants of fiscal transparency 3 (OLS)

	1	2	3	4	5	6	7
FUELX	-0.013***	-0.0135***	-0.016**	-0.009*	-0.013***	-0.237***	-0.185**
	(0.00469)	(0.00481)	(0.00645)	(0.00537)	(0.00496)	(0.0698)	(0.0723)
LYP	0.199	0.205	0.00582	0.197	0.209	-0.612	-3.080
	(0.197)	(0.235)	(0.459)	(0.243)	(0.236)	(3.364)	(3.511)
AGE	0.104**	0.112**	0.240***	0.124**	0.112**	1.575*	1.751**
	(0.0433)	(0.0480)	(0.0774)	(0.0596)	(0.0482)	(0.857)	(0.801)
URBAN	0.00922	0.00758	0.00504	0.00138	0.00723	0.225	0.257*
	(0.00961)	(0.0109)	(0.0235)	(0.0106)	(0.0111)	(0.136)	(0.130)
OECD	2.233***	2.408***	2.670***	2.329***	2.424***	6.011	2.979
	(0.643)	(0.706)	(0.784)	(0.727)	(0.706)	(10.12)	(9.514)
AFRICA	0.676	1.010	2.685***	1.184	1.068	-5.205	-11.75
	(0.584)	(0.708)	(0.936)	(0.772)	(0.721)	(13.48)	(12.86)
ASIAE	0.0558	0.321	-0.111	0.205	0.336	-9.408	-14.89
	(0.376)	(0.549)	(0.397)	(0.550)	(0.541)	(9.460)	(9.536)
LATAM	0.316	0.634	0.944	0.800	0.654	-5.686	-11.56
	(0.589)	(0.662)	(0.556)	(0.756)	(0.646)	(9.999)	(9.661)
MENA	-0.847	-0.528		-0.186	-0.457	-14.55	-18.92*
	(0.533)	(0.694)		(0.742)	(0.776)	(12.37)	(11.18)
LO_uk		0.00861		0.119	0.00263	13.01**	16.21***
		(0.380)		(0.400)	(0.388)	(5.594)	(5.257)
LO_so		0.279		0.296	0.297	-4.140	-5.759
		(0.530)		(0.515)	(0.526)	(8.297)	(7.995)
LO_ge		-0.199		-0.144	-0.208	3.287	5.025
		(0.598)		(0.638)	(0.605)	(8.538)	(8.076)
LO_sc		1.718***		1.842***	1.706***	22.55***	24.02***
		(0.475)		(0.491)	(0.485)	(8.300)	(7.771)
Log SM			-0.500				
			(0.333)				
POLITY				0.0431			
				(0.0446)			
GOVSEATS					-0.232		
					(1.343)		
POLAR						0.0117**	
						(0.00549)	
GOVFRAC							0.0482**
							(0.0189)
Constant	-4.612*	-5.349**	-9.236***	-6.022*	-5.254*	-52.11	-40.54
	(2.399)	(2.675)	(2.881)	(3.375)	(2.820)	(45.25)	(42.02)
Observations	81	81	30	79	81	85	85
R-squared	0.680	0.691	0.795	0.699	0.691	0.579	0.626

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.5: Determinants of fiscal transparency 4 (OLS)

	1	2	3	4	5	6	7
FISCALW	-0.862***	-0.857***	-0.798**	-0.504	-0.843***	-0.866***	-0.745***
	(0.247)	(0.260)	(0.345)	(0.421)	(0.264)	(0.264)	(0.245)
LYP	0.170	0.170	0.0340	0.144	0.176	0.173	0.0611
	(0.188)	(0.216)	(0.463)	(0.215)	(0.216)	(0.216)	(0.206)
AGE	0.107**	0.115**	0.247***	0.128**	0.115**	0.118**	0.111**
	(0.0423)	(0.0466)	(0.0798)	(0.0584)	(0.0468)	(0.0468)	(0.0470)
URBAN	0.00983	0.00823	0.000125	0.00198	0.00777	0.00824	0.00985
	(0.00942)	(0.0103)	(0.0230)	(0.00988)	(0.0104)	(0.0103)	(0.00977)
OECD	2.364***	2.451***	2.937***	2.365***	2.470***	2.505***	2.338***
	(0.626)	(0.690)	(0.761)	(0.715)	(0.687)	(0.692)	(0.827)
AFRICA	0.706	0.947	2.852***	1.116	1.016	1.048	0.602
	(0.575)	(0.685)	(0.962)	(0.759)	(0.711)	(0.671)	(0.857)
ASIAE	0.183	0.366	0.158	0.183	0.384	0.455	0.0763
	(0.372)	(0.530)	(0.432)	(0.551)	(0.520)	(0.524)	(0.707)
LATAM	0.444	0.666	1.296**	0.805	0.689	0.739	0.351
	(0.585)	(0.654)	(0.581)	(0.759)	(0.633)	(0.657)	(0.806)
MENA	-0.862*	-0.645		-0.241	-0.564	-0.574	-0.821
	(0.501)	(0.649)		(0.731)	(0.748)	(0.644)	(0.761)
LO_uk		-0.0111		0.127	-0.0190	-0.0216	0.0245
		(0.360)		(0.381)	(0.371)	(0.365)	(0.360)
LO_so		0.168		0.207	0.192	0.0912	0.242
		(0.513)		(0.501)	(0.510)	(0.520)	(0.685)
LO_ge		-0.185		-0.0947	-0.196	-0.212	-0.0767
		(0.584)		(0.636)	(0.593)	(0.587)	(0.587)
LO_sc		1.730***		1.872***	1.715***	1.728***	1.770***
		(0.468)		(0.487)	(0.480)	(0.472)	(0.472)
Log SM			-0.447				
			(0.319)				
POLITY				0.0511			
				(0.0527)			
GOVSEATS					-0.264		
					(1.361)		
POLAR						-0.00113	
						(0.00274)	
GOVFRAC							0.00267**
							(0.00131)
Constant	-4.700*	-5.349**	-10.21***	-5.911*	-5.243*	-5.621**	-4.033
	(2.359)	(2.635)	(3.005)	(3.398)	(2.769)	(2.605)	(2.872)
Observations	82	82	30	80	82	82	82
R-squared	0.679	0.689	0.788	0.700	0.690	0.690	0.710

Robust standard errors in parentheses

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

Finally, drawing on Dunning (2008), I instrument the two fiscal windfalls proxies with his oil rents per capita variable (*RENTS*) defined in chapter 2. Table 4.6 shows results.

Table 4.6: IV Regressions of Fiscal Transparency

	Full Sample	Polity > 0	Full Sample	Polity > 0
	1	2	3	4
		Panel A: 2SLS		
FUELX	-0.578***	-0.291**		
	(0.162)	(0.137)		
FISCALW			-40.58***	-25.57**
			(11.46)	(12.41)
LYP	0.480	-1.777	2.089	-0.371
	(3.653)	(3.198)	(3.389)	(3.192)
AGE	1.306*	2.149***	1.395*	2.350***
	(0.760)	(0.721)	(0.764)	(0.795)
URBAN	0.388**	0.413***	0.267*	0.311**
	(0.152)	(0.132)	(0.145)	(0.138)
OECD	-6.670	6.092	-0.639	6.831
	(11.94)	(10.70)	(11.98)	(11.28)
AFRICA	-5.519	5.765	2.119	9.044
	(12.45)	(11.97)	(13.51)	(12.90)
ASIAE	-9.846	1.418	1.073	5.662
	(9.266)	(9.451)	(10.11)	(10.11)
LATAM	-10.41	-1.011	-3.863	3.029
	(11.06)	(10.45)	(11.56)	(11.65)
MENA	-15.40	-30.51*	-15.96	-26.83
	(13.39)	(16.53)	(13.45)	(17.51)
LO_uk	16.40***	16.25***	8.913	13.03**
	(5.665)	(5.397)	(5.744)	(5.580)
LO_so	-10.59	-1.948	-10.94	-4.016
	(9.426)	(8.784)	(9.605)	(9.350)
LO_ge	-1.544	-3.853	-7.095	-7.384
	(13.58)	(11.27)	(14.10)	(12.01)
LO_sc	30.60**	25.09**	11.44	15.69
	(14.47)	(11.91)	(14.21)	(11.80)
	Panel B: First Stage for Fuel Exports and Fiscal Windfalls			
RENTS	0.036***	0.0902***	0.000518***	0.001***
	(0.007)	(0.008)	(0.000)	(0.000)
LYP	-4.923	-4.565**	0.0103	-0.0307
	(4.991)	(2.146)	(0.0662)	(0.0494)
AGE	0.546	0.483	0.00530	0.0149
	(1.019)	(0.471)	(0.0152)	(0.0115)
URBAN	0.175	0.188**	-0.001	-0.0005
	(0.197)	(0.0900)	(0.00285)	(0.00209)
CONTINET DUMMIES?	YES	YES	YES	YES
LEGAL ORIGINS?	YES	YES	YES	YES
R-squared	0.40	0.77	0.35	0.5
Observations	80	62	84	63

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In the Table, Columns 2 and 4 restrict the sample to political systems with strictly positive polity scores between 1990 and 2008 on average. Results from these 2SLS regressions are substantially larger than the OLS estimates. For example, across the sample of democracies, countries considered highly dependent on fiscal windfalls tend to score on average 25 points less than their non-dependent counterparts on the fiscal transparency index. In sum, the negative relationship found between windfalls and transparency is robust to a number of robustness checks: it is present *across* democracies, it is not an artifact of the particular index of choice measuring the dependent variable, and finally, is stronger when an instrumental variable approach is called for.

Conclusion

In previous empirical chapters, I have shown that countries dependent on fiscal windfalls are more procyclical in their public spending (chapter 2), and tend to engage in political budget cycles (chapter 3). Both findings can be embedded in a political agency framework of elections that *assumes* the structure of public finance (where revenue comes from?) generates informational rents to incumbents (chapter 1). The present chapter has put to an empirical test the plausibility of this assumption, by exploring the relationship between fiscal windfalls and transparency in a cross-national context.

Using two cross-sectional indexes of fiscal transparency covering 107 different countries, this chapter has shown that the combination of transparency and fiscal windfalls is a difficult one: budget processes in *democracies* highly dependent on non-tax revenue sources are substantially less transparent than democracies with a different budget constraint, a finding that is robust to a number of economic and political controls. I interpret these results as evidence

about the relative lack of information that voters posses in windfall contexts about government's fiscal activities and the process behind their taxing and spending decisions.

While suggestive, the evidence presented in this chapter only exploits cross-sectional variation in the data. Ideally, we would like to explore how transparency changes over time as governments become more dependent on fiscal windfalls. Given data limitations, this type of research design is difficult to implement in a cross-national context, where panel data on fiscal transparency is still lacking. However, one could exploit inter-temporal change in other contexts. Thus, the next chapter explores the relationship between windfalls and transparency by studying the impact of the latest oil shock on the public finance across Brazilian municipalities.

Appendix 4.1

Table A4.1. Summary statistics and data sources

Variable	Definition	Obs.	Mean	Std. Dev.	Min	Max	Source
FT IBP	Fiscal transparency index	94	42.22	24.51	0.00	92.00	International Budget Partnership
FT 2	Fiscal transparency index	82	4.17	1.87	1.70	9.00	Andreula et al. 2009
FUELX	Fuel exports as % of total merchandise exports	89	17.28	27.29	0.00	96.51	WDI*
FISCALW	Dummy variable =1 if fiscal revenue from oil, gas, minerals >= 25%	94	0.20	0.40	0.00	1.00	IMF 2007
LYP	Log of GDP per capia, constant 2000 $	92	7.35	1.43	4.70	10.49	WDI
AGE	% of Population between 15 and 64	94	60.11	6.39	48.26	71.37	WDI
URBAN	% of Population in urban areas	94	50.22	21.92	10.82	89.84	WDI
POLITY2	Democracy-Autocracy score	91	3.71	5.62	-10.00	10.00	POLITY
GOVSEATS	% seats government party	91	0.64	0.16	0.30	1.18	DPI**
POLARIZ	Policy distance between exectuvie and legislature	91	-33.96	134.91	-999.00	2.00	DPI
GOVFRAC	Government fractionalization	91	-90.55	170.80	-699.22	0.73	DPI

*World Development Indicators

** Database of Political Institutions, WB

Table A4.2: Fiscal windfalls and governance indicators (OLS)

	Voice&Account		*Goveff*		*Rulelaw*		*Controlcorr*	
FUELX	-0.010***		-0.008***		0.002		-0.009***	
	(0.00164)		(0.00143)		(0.00332)		(0.00158)	
FISCALW		-0.712***		-0.524***		-0.0133		-0.584***
		(0.136)		(0.118)		(0.261)		(0.115)
LYP	0.244***	0.273***	0.416***	0.423***	0.0865	0.140	0.340***	0.358***
	(0.0888)	(0.0743)	(0.0691)	(0.0656)	(0.201)	(0.133)	(0.0791)	(0.0665)
OECD	0.368	0.421	0.619***	0.687***	-0.879	-0.921	1.023***	1.083***
	(0.454)	(0.377)	(0.200)	(0.237)	(0.698)	(0.653)	(0.255)	(0.270)
AFRICA	0.0612	-0.181	0.521***	0.309	-0.553	-0.178	0.674***	0.453*
	(0.525)	(0.444)	(0.181)	(0.235)	(0.716)	(0.584)	(0.228)	(0.248)
ASIAE	-0.420	-0.302	0.231*	0.306	-0.220	-0.150	0.114	0.205
	(0.432)	(0.385)	(0.133)	(0.190)	(0.538)	(0.486)	(0.146)	(0.187)
LATAM	0.00909	-0.00146	0.0144	0.0125	-1.051*	-0.828*	0.249	0.225
	(0.466)	(0.397)	(0.171)	(0.203)	(0.563)	(0.480)	(0.194)	(0.216)
MENA	-0.606	-0.826*	0.193	0.0225	-0.345	0.0178	0.549**	0.325
	(0.484)	(0.418)	(0.206)	(0.216)	(0.617)	(0.555)	(0.253)	(0.228)
LO_uk	0.0569	0.0819	0.0933	0.104	-0.109	-0.113	0.148	0.157
	(0.154)	(0.172)	(0.0944)	(0.123)	(0.337)	(0.295)	(0.126)	(0.132)
LO_so	-0.253	-0.113	0.102	0.186	-0.706	-0.713	0.166	0.267
	(0.398)	(0.376)	(0.121)	(0.176)	(0.472)	(0.429)	(0.139)	(0.177)
LO_ge	0.124	0.202	0.0820	0.149	0.705	0.551	0.188	0.262
	(0.164)	(0.199)	(0.141)	(0.175)	(0.581)	(0.611)	(0.207)	(0.209)
LO_sc	0.521**	0.185	0.572***	0.324*	-0.770	-0.664	0.823***	0.525**
	(0.216)	(0.130)	(0.191)	(0.169)	(0.603)	(0.580)	(0.232)	(0.223)
Constant	-3.200***	-1.870**	-4.387***	-3.446***	1.555	-0.522	-4.401***	-3.213***
	(1.193)	(0.725)	(0.656)	(0.506)	(2.074)	(1.178)	(0.768)	(0.526)
Observations	86	90	86	90	84	88	86	90
R-squared	0.767	0.730	0.869	0.827	0.139	0.121	0.841	0.802

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A4.3: Data on Fiscal Transparency (FT)

Country	FT IBP (2010)	FT Andreula et al (2009)	Country	FT IBP (2010)	FT Andreula et al (2009)	Country	FT IBP (2010)	FT Andreula et al (2009)
Afghanistan	21		India	67	4.28	SaoTome	0	
Albania	33	3.59	Indonesia	51	3.26	Saudi Arabia	1	
Algeria	1	2.1	Iran		2.56	Senegal	3	
Armenia		4.28	Iraq	0.4		Serbia	54	
Angola	26		Israel		6.88	Slovakia	57	6.32
Argentina	56		Italy	58	5.73	Slovenia	70	5.04
Azerbaijan	43	2.2	Japan		6.34	South Africa	92	
Bangladesh	48	2.52	Jordan	50	1.78	Spain	63	5.48
Barbados		4	Kazakhstan	38	3.15	Sri Lanka	67	3.8
Belarus		1.72	Kenya	49	3.24	Sudan	8	
Belgium		7.92	Korea	71	5.48	Sweeden	83	8.73
Benin		3.8	Kyrgyz	15	2.83	Tajikistan		3.88
Bolivia	13		Latvia		3.77	Tanzania	45	3.44
Bosnia-Herze.	44		Lebanon	32	1.93	Thailand	42	
Botswana	51		Liberia	40		Timor Leste	34	
Brazil	71	7.54	Lithuania		4.04	Trinidad Tobago	33	
Bulgaria	56	2.64	Macedonia	49	5.12	Tunisia		3.59
Burkina Faso	5	2.8	Malawi	47	1.84	Turkey	57	3.36
Cambodia	15		Malaysia	39		Uganda	55	2.96
Cameroon	2	2.3	Mali	35	2.88	Ukraine	62	5.55
Canada		8.56	Mauritania		2.33	United Kingdom	87	
Chad	0.4		Mexico	52	4.17	United States	82	8.43
Chile	72	7.17	Moldova		4.92	Uruguay		3.4
China	13		Mongalia	60	3.32	Venezuela	34	
Colombia	61	3.76	Morocco	28	3.75	Vietnam	14	
Costa Rica	47	5.08	Mozambique	28	2.88	Yemen	25	
Croatia	57	2.96	Namibia	53	3.67	Zambia	36	
Cyprus		4.5	Nepal	45				
Czech Republic	62	5.63	Netherlands		9.04			
DRC	6		New Zealand	90				
Dominican Rep	14		Nicaragua	37	2.08			
Ecuador	31		Niger	3				
Egypt	49		Nigeria	18				
El Salvador	37	1.71	Norway	83				
Equitorial Guinea	0	1.92	Pakistan	38	2.52			
Estonia		4.7	Papua New G.	57	3.81			
Fiji	0	2.48	Paraguay		2.68			
France	87	8.12	Peru	65	4.96			
Gabon		3.16	Philippines	55	3.84			
Georgia	55	3.54	Poland	64	4.8			
Germany	68	7.56	Portugal	58	6.12			
Ghana	54	2.8	Romania	59	4.92			
Guatemala	50	3.18	Russia	60	3.72			
Honduras	11	3.14	Rwanda	11	2.22			
Hungary		6.92	Samoa		2.72			

Chapter 5. Subnational level evidence: the case of Brazilian municipalities

The coastal municipality of Campos dos Goytacazes is located in the north of Rio de Janeiro state. In the peak of the last oil boom, it received R$ 1343 million (US$ 803 million) in the form of royalty payments, or 24 percent of total oil rents distributed to all local governments during 2008. The municipality of Sao Francisco de Itapobena, Campos' neighboring and also coastal local government, received the equivalent of R$ 6.8 million (US$ 4 million) in royalty payments, or 0.12% percent of total oil rents in the same year. Why such disparity in benefits despite the geographic contiguity?

While various rules comprise the allocation of royalty payments among the different levels of government in Brazil, the bulk of such of type of fiscal windfall is distributed across municipalities according to a *geographic* criterion: a local government is entitled to royalty payments if its coast happens to confront an oil well located kilometers away in the ocean, according to orthogonal and parallel projections. Thanks to the shape of its coast, Campos confronts the lion share of the country's most productive off-shore oil fields, but Sao Francisco's coast does not, resulting in the fact that the latter municipality receives 200 times less royalty revenue than the former.

In addition to being one of the single largest recipients of windfall wealth, the municipality of Campos is also (in)famous for the way it manages its public accounts. Public finance in Campos are characterized by a general mark of opacity: Since 2001, the municipality has reported levels of local expenditures and revenues to the federal government, an obligation

under the current Fiscal Responsibility Law (2000), in only four years. In contrast, its neighbor Sao Francisco, has sent its fiscal information to the central government every year.

This chapter will show that this type of story can go beyond a tale of two cities. Based on a sample of more than 5000 municipalities observed between 2000 and 2009, this chapter first explores the connection between oil wealth and fiscal transparency at the subnational level in Brazil and shows that oil benefited municipalities have a higher probability of not disclosing their public finance, a finding that is consistent and complementary to the cross-national evidence linking oil dependence with low levels of fiscal transparency of the previous chapter.

Based on available fiscal information, this chapter then explores how elections and windfall wealth interact to affect the levels and composition of local government expenditures. Previous research shows that while oil production is followed by significant increases in municipal revenues and spending levels across oil benefited municipalities, such fiscal expansions have not been in general accompanied by corresponding improvements in local public good outcomes (Caselli and Michael 2009; Ferraz and Monteiro 2010). For example, in 2010, the last year for which public finance data is available, a recent annual report shows that among the top 20 municipalities ranked in terms of legislative expenses per capita, four were royalty recipients.[61] This figure jumps to nine when considering personnel spending and administrative costs per capita. However, no royalty recipient municipality is included among the top 20 local governments with higher education expenses per student, suggesting that a large fraction of total spending funded by windfall wealth is not being devoted to genuinely useful public projects. [62]

[61] *Multi Cidades 2011-Financas dos Municipios do Brazil*. Available at www.aequus.com.br/anuarios_brasil.html

[62] In fact, the common picture is one in which oil rich municipalities are frequently involved in corruption scandals, with incumbents being accused (and ousted from office) for misuse of public funds, using public resources for the

This chapter complements this previous work by studying in detail the behavior of fiscal policy in oil-benefited municipalities in the vicinity of elections. It not only finds that the size of the political budget cycle is larger among local governments entitled to important amounts of royalty payments, but also uncovers its nature by looking at how incumbents manipulate the composition of the budget in electoral years. Finally, this chapter explores the electoral returns of additional government spending and asks whether local voters reward incumbent mayors (or their co-partisans) who engage in election year spending binges. The results show that incumbent mayors who increase public spending in election years boost their party vote share, and their probability of reelection goes up as a function of this increase.

In analyzing the impact of windfall revenue on local public finance, this chapter speaks to a recent literature on the political and economic effects of different government revenue sources (e.g., taxes, transfers, royalty payments) at the municipal level in Brazil. Some studies focus on the role of intergovernmental transfers in shaping: i) candidate quality and the incidence of corruption (Brollo et al. 2010); and ii) public spending levels and electoral outcomes (Litschig and Morrison 2010). Others contrast the effects of transfers vis-a-vis own tax collection efforts on the allocation of government expenditures, providing empirical evidence that transfers are more prone to be spent on goods not as valued by voters and that an increase in taxes leads to public spending of higher quality (Mendes 2005; Gadenne 2011). More closely related to the topics covered in this chapter are several recent studies exploring the impact of the recent oil shock, and corresponding royalty flows to municipal governments, on a number of different outcomes, such as local levels of public good provision and measures of living standards (Caselli

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financing of free live concerts, scolas do samba, and the sponsorship of soccer clubs.

and Michaels 2009), growth rates (Postali 2009); tax effort (Queiroz and Postali 2010); and levels of political competition and patronage (Ferraz and Monteiro 2010).

From a methodological standpoint, the focus on Brazilian local governments provides a unique opportunity to study *subnational* variation in the outcomes of interest of this dissertation. With its more than 5000 municipalities observed over a time span of 10 years, such a research design allows one to expand the number of available observations while at the same time holding constant the institutional, cultural, and policy environment that usually confound cross-country comparisons (Snyder 2001). In addition, the case of Brazil is substantively interesting for two reasons: first, because the high levels of royalty payment decentralization provide an opportunity to observe how the effects of fiscal windfalls operate at the local level. Secondly, for a study in which one of the outcomes of interest is the political budget cycle, it is convenient for the researcher to have a system with a fixed, or exogenous, electoral calendar. The presidential nature of the Brazilian regime provides such a context. In sum, methodological as well as substantive reasons make the Brazilian municipalities serve as a new and interesting testing ground for the theoretical assumptions and hypotheses of this dissertation.

To reiterate some of these main assumptions and hypotheses, recall from chapter 1 (theory) that in the presence of fiscal windfalls, the theory assumes that voters are likely to face serious informational constraints about the true state of public finance (e.g. how much revenue the government has) and thus, they are also more uncertain about the extent of rent extraction by incumbents. The empirical correlate of this assumption is that levels of fiscal transparency are expected to be relatively low when non-tax revenue sources make up an important share of the government's budget constraint. This chapter tests this assumption using royalty payments as a

measure for fiscal windfalls and exploiting variation in municipality's willingness to declare public finance data to the federal government (a proxy for fiscal transparency).

Given these informational constraints, I argue it is optimal for voters to demand higher levels of public goods from incumbents in the face of a positive economic shock as a way to limit the extent of rent extraction. From a supply side perspective, the fact that voters demand public goods induces politicians to engage in opportunistic manipulations of the budget around election times. In the presence of windfall revenue, such a motivation is coupled with an opportunity structure: incumbents tend to enjoy a large share of the political benefit of spending but pay only a small fraction of the political cost of taxation. Thus, we should expect these authorities to use such low-cost spending power to remain in office and elections represent an important political opportunity to do so. Thus, the political budget cycle emerges as another empirical implication of the theory and this chapter looks at its size by comparing municipalities entitled to receive royalties and less fortunate types. Finally, the theory expects that in the presence of windfall wealth, voters should reward (or at least not punish) incumbents who increase expenditures around elections. This chapter thus looks at whether fiscal expansions during election years are punished or rewarded by local voters at the polls.

This chapter is organized as follows. Section 1 presents some basic styled facts on Brazilian local government's revenue sources, spending responsibilities, as well as the rules regarding the distribution of oil wealth across different government tiers. After briefly describing the data sources to be used in the empirical analysis (Section 2), Section 3, the core of the paper, contains three different but related empirical exercises. In particular, the section analyzes the impact of royalty payments on municipalities: a) levels of fiscal transparency, b) size of political budget cycles, and c) the electoral returns of spending increases for incumbent mayors (or their

co-partisans). Each of these exercises tests at the subnational level the assumptions and hypotheses already tested in previous empirical chapters in a cross-national context.[63] Conclusions follow.

5.1 Background

Fiscal federalism, elections, and local public finance. Brazil is a federal and presidential republic, composed of 27 states (including the Federal District) and 5,564 municipalities. The states and municipalities together account for more than one-third of national tax revenue collection, and two-fifths of total government spending; that is, figures that represent levels of fiscal decentralization not only comparable to OECD federations (Afonso and Mello 2000), but that also make Brazil one of the most decentralized developing countries in the world (Bardhan and Mookherjee 2006; Shah 2006). Municipal or local governments undertake an important share of total spending in Brazil (6.5% of GDP), yet they collect only a small fraction of total taxes (2% of GDP). Local level spending accounts for 15% of consolidated public sector expenditures, and municipalities have played an increasingly important role in the provision of social services such as (preventive) health care and (primary) education, which together make up almost half of municipality's total outlays. Mayors are also in charge of providing basic public services to the municipality, particularly in the area of public transportation, which is a policy issue under the exclusive jurisdiction of local governments (Afonso and Araujo 2006).

In terms of revenue mobilization, while the Constitution allows substantial room for municipalities to collect their own taxes, there is divergence between municipalities' de jure tax

[63] I do not explore the procyclicality hypothesis here since public expenditure smoothing is seldom carried out by subnational governments, a stylized fact for both developed and developing federations (Struzzenger and Werneck 2008; Arena and Revilla 2009; Rodden and Wibbels 2010; Besfamille et al. 2012).

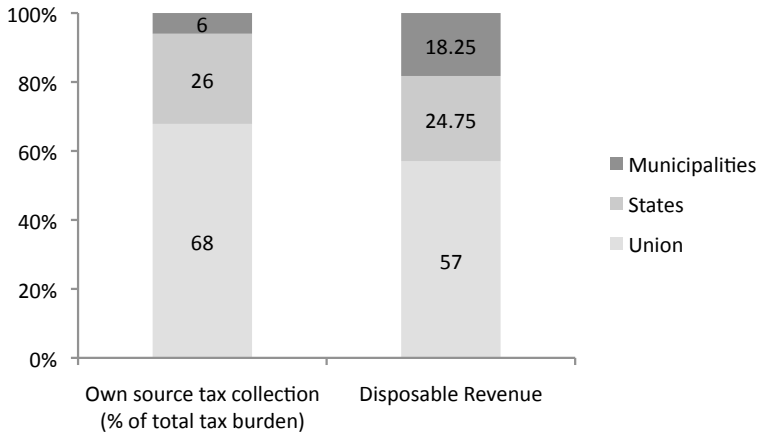
capacity and their de facto levels of tax collection (Gadenne 2011). For example, in 2009, local governments collected from their two main local taxes[64] levels that ranged from 1 to 2100 R$ per capita. Between 2000 and 2009, local governments financed on average only 6% of municipal budgets with their own tax revenues (*receitas tributarias*), although there is great variation around this figure: in the relatively poor municipalities of states like Maranhão, local taxes make up less than 1% of total revenues, while in the richer municipalities of Sao Paulo, local tax collection accounts for more than 60% of total revenues.

To address such large vertical fiscal asymmetries, the bulk of municipal spending is supported by a complex system of revenue sharing and intergovernmental fiscal grants, enshrined in the constitution of 1988 whereby both the Union (and state governments) redistribute fiscal resources toward the lower tiers under different revenue schemes and funds.[65] As shown in Figure 5.1, municipalities are the main beneficiaries of such a system, as their share of disposable revenue (that is, revenue available after intergovernmental transfers have taken place) is three times as large as their contribution to the total tax burden.

[64] A tax on services (ISS), and the urban property tax (IPTU).

[65] See Afonso and Rezende (2006) and Serra (2007) for details on fiscal federalism in Brazil.

Figure 5.1: Tax collection and disposable revenues by level of government (2010)



Source: Afonso and Castro (2011)

The most important federal equalization transfer scheme for the municipalities is the *Fundo de Participacao dos Municipios* (FPM) a constitutionally mandated transfer that redistributes resources according to population criteria, which in 2009 represented 42% of local government's revenues on average and that is responsible for achieving relatively high levels of inter-regional redistribution (Arretche 2010).[66] In sum, municipal politicians enjoy a large share of the political benefit of spending, yet pay only a small fraction of the political cost of taxation. How are they elected? As in other presidential systems, the electoral calendar in Brazil is fixed. Local elections (for mayor and municipal council) are held every four years on a different cycle than presidential and gubernatorial elections.[67] Thanks to a constitutional reform in 1997 softening term limits at all levels of government, mayors are allowed to be reelected once, with the possibility of

[66] Transfers received under the revenue-sharing of the tax on Service and Goods circulation (ICMS) are transfers originated from tax collected by the states and represent the second largest source of transfers for municipalities.

[67] Municipal elections are held countrywide at the end of the year. The new administration begins in January of the following year.

returning after a one-term hiatus. Thus, the 2000 elections marked the introduction of a second consecutive term possibility for local incumbents.

The oil boom, Brazilian style. Against this background of large fiscal imbalances, one should add the fact that some municipalities were benefited with additional revenue stemming from natural resource rents since the early 2000s, a result of increased oil production and new legislation governing the exploitation, regulation of the oil industry, and distribution of oil revenue between different government levels (Law 9478/97).[68] Oil rents in Brazil are extracted through two main tax instruments: The so-called ***Royalties*** – a 10% ad valorem tax over the gross revenue of oil production – and the ***Special Participation*** tax – a tax levying on the income of highly productive projects.[69] While in 1998 these two sources of revenue accounted for only 0,03% of GDP, this figure ascended to almost 1% in 2008 (Afonso and Castro 2010).[70]

High levels of vertical decentralization characterize the distribution of oil revenue in Brazil: around 60 to 65% of total royalty payments are transferred to the states and municipalities through a combination of different rules applying to on-shore and off-shore production (Afonso and Castro 2008). Rules regarding the distribution of rents from off-shore production make the municipalities the largest single recipients of rent revenue, and since the recent increase in oil production has been largely an off-shore phenomenon (95% of total production), municipalities have been one of the key beneficiaries of the system during the last

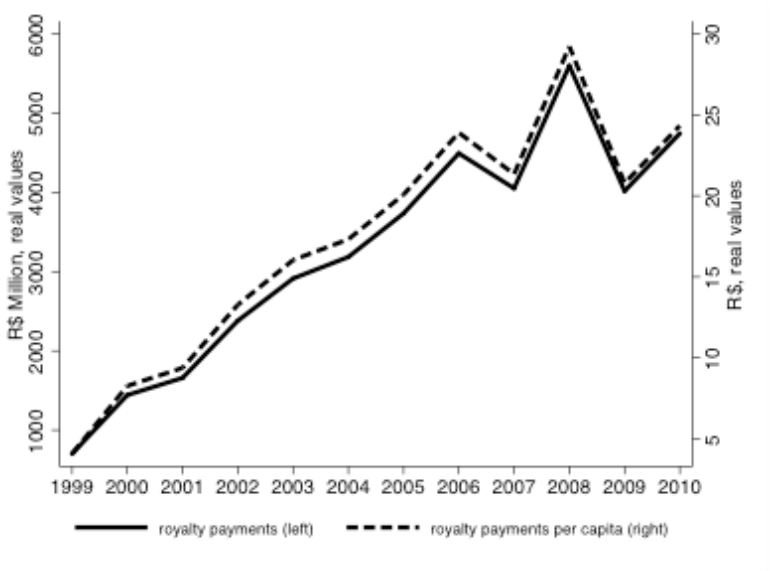
[68] Production growth has been accompanied by increases in proven reserves, which are likely to increse even more in the medium run with full exploitation of the "pre-sal" (below the salt) oilfieds that lie below 2km of water, and 3 km of salt in the Santos Basin.

[69] For simplicity will refer to both concepts as royalty payments from now on.

[70] This upward trajectory is the result of a combination of factors. In addition to the market incentives provided by the new regulatory framework, the volume of royalty payments increased for two more reasons: the rise in oil prices after 2000 and the currency devaluation in 1999, since royalties are priced in dollars (Postali 2009).

boom (Ferraz and Monteiro 2010; Gobetti 2011). Figure 5.2 shows the recent increase in royalty payments as a result of the oil boom.

Figure 5.2: Royalty payments to municipalities, 1999-2010



Two main rules define whether a municipality is entitled to receive royalties: (1) the municipality must be considered a 'producer locality', and (2) the municipality must be directly or indirectly impacted by oil and gas production. [71] In the case of *off-shore* production, eligibility as producer is driven by a **geographic** criterion: a municipality is considered a "bordering" (*confrontante*) municipality if it happens to confront an oil well located kilometers away in the ocean, according to orthogonal and parallel projections to the Brazilian coast extracted from nautical letters as shown in Figure A5.1 (Appendix). Thus, depending on the shape of its coast, the municipality includes more or less wells under its area, receiving royalty payments accordingly. Regarding the second rule, all activities of embarkation and

[71] See Afonso and Gobetti (2008) and Afonso and Castro (2010) for excellent overviews of the governance structure of the oil sector in Brazil.

disembarkation (including transportation by pipelines) are included in the criteria of eligibility (Postali 2009).

As a result of these criteria, royalty payments are largely concentrated in some ***coastal*** states and municipalities in Brazil (see Figure A5.2, Appendix). Figure 5.3 shows the distribution of royalty payments between the main nine producing states in Brazil (plus Amazonas) in 2008. The state of Rio de Janeiro alone concentrates 83% of total royalty payments at the state level, since the major oil basins – Campos Basin and Santos Basin – are located in front of this state's coast, making it the major oil producer in the country.

Figure 5.3. Royalty payments by state in 2008, R$ Million, Real values

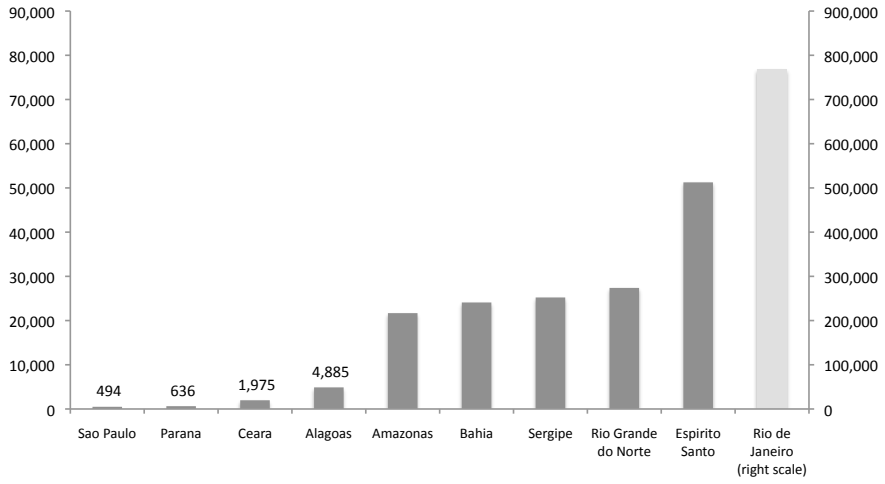
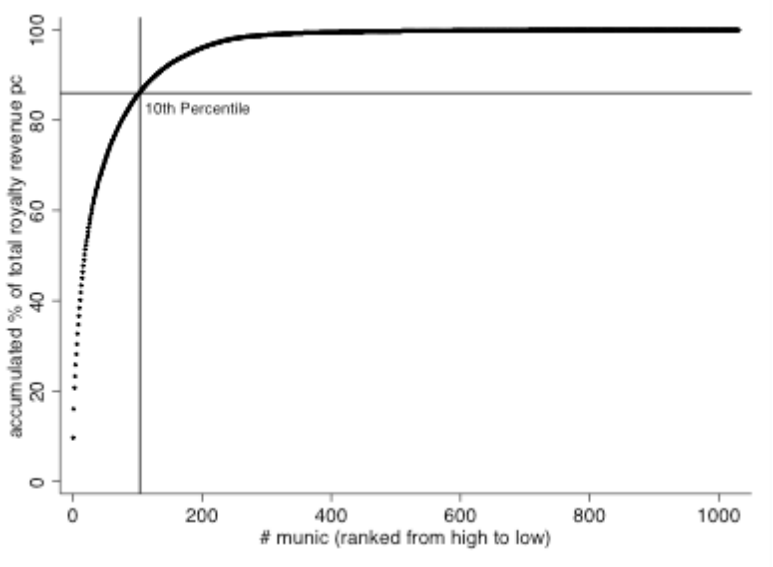


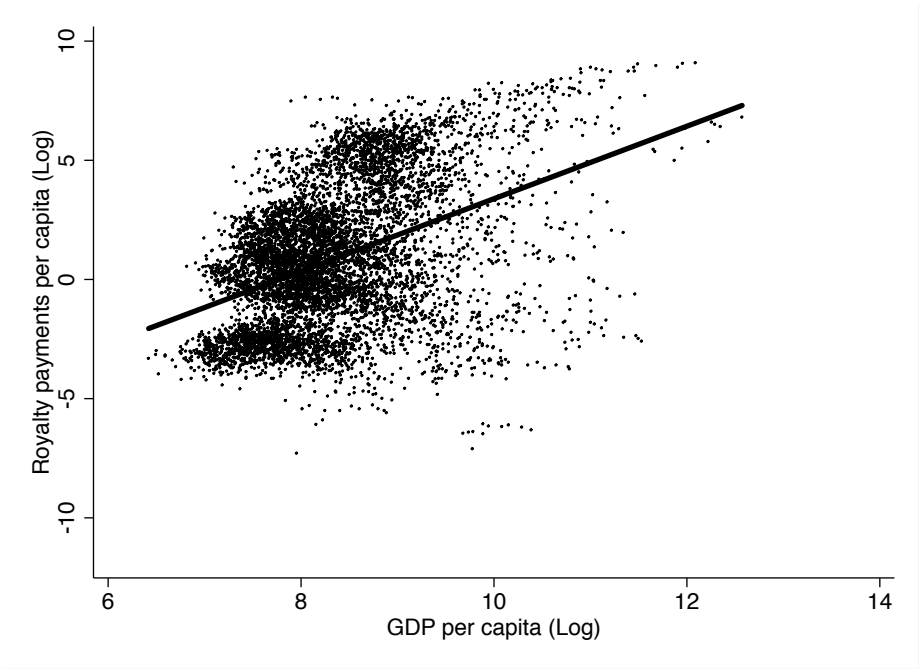
Figure 5.4 turns to the distribution of royalty payments across municipalities: it plots each municipality, ranked in terms of the size of royalty payments per capita received in 2010. As with the states, a similar picture of highly unequal distribution among municipalities is apparent (Gobetti et al. 2010).

Figure 5.4: Concentration of royalty payments across municipalities (2010)



Only twenty (out of more than 5000) municipalities account for more than half of total per capita royalty payments, and the top ranked 100 municipalities for more than 80%. These municipalities tend to be the relatively richer municipalities belonging to South East Brazil, the most developed region of the federation (Serra 2007). As shown in Figure 5.5, there is a clear positive relationship between levels of local GDP and royalty payments per capita, a fact that tends to accentuate already high levels of regional disparities and to off-set the relatively progressive characteristics of some federal intergovernmental transfers schemes such as FPM (Afonso and Castro 2010; Gobetti et al. 2010).

Figure 5.5: Development and oil wealth at the local level



Based on normative grounds like inter-regional and generational justice principles, the current criteria linking geography to oil rents has stirred important criticisms from the specialized literature (Serra 2007, Gobetti et al. 2010), and of course, the creation of a non-producer states coalition in Congress with reform proposals that attempt to "universalize" the distribution of royalties.[72] From an academic point of view, however, the fact that an important share of total royalty distribution follows a geographic criterion provides the researcher with an important source of exogeneity to study the effects of fiscal windfalls on local public finance, an exercise we turn into in Section 5.3, after describing some basic features of the data (see below).

[72] For example, a bill introducing a change to the current scheme in favor of allocating royalty payments to *all* municipalities according to FPM criteria passed through Congress but was vetoed by outgoing president Lula in 2010. A similar bill has been approved by the Senate in late 2011, but a decision by the Lower House on whether to ratify or amend it is still pending.

5.2 Data

To study the effects of fiscal windfalls on local public finance, three key data sources were employed. First, annual variation in royalty payments received by all levels of government including municipalities between 1999 and 2010 is provided by *Info-Royalties* website (http://inforoyalties.ucam-campos.br), created by a local research center (UCAM, Universidade Candido Mendes).[73] Second, electoral results from 1996, 2000, 2004, and 2008 local elections, as well as party identification of incumbent mayors and challengers are available from Tribunal Superior Eleitoral (TSE). Finally, data on public finance, including detailed information on levels and sources (own tax, transfers, type of transfers, etc.) of local government revenues as well as size and composition of government expenditures are available from the National Treasury from 2000 to 2009, trough the Finanzas do Brasil (FINBRA) database.[74] It is important to note that these data are self-declared by municipalities, that local government are obliged to report this information to the federal government, but not all of them do so every year. Following the lead of Ferraz and Monteiro (2010), this fact will be exploited in the next section when looking at the determinants of fiscal transparency across municipalities.

5.3 Evidence

This section contains three different empirical exercises: I first test the hypothesis that fiscal windfalls, in the form of royalty payments, are associated with lower transparency in the budget process, as measured by the probability of a municipality disclosing its public accounts to the federal government in a given year. Secondly, I study whether royalty revenue conditions the

[73] Programa de Mestrado em Planejamento Regional e Gestão de Cidades, da Universidade Candido Mendes - Campos dos Goytacazes (RJ).

[74] All fiscal variables in the FINBRA database were expressed in real per capita terms, in Brazilian currency units (Real—R$) of 2011.

impact of elections on the level and composition of government expenditures by looking at the issue of "political budget cycles". Finally, I turn to the electoral returns of public spending increases in a subsample of municipalities.

5.3.1 Do royalty payments reduce fiscal transparency?

Given that municipalities self-report public finance data to the National Treasury, and that royalty payment data is collected independently from this source, our first exercise tests whether being a royalty recipient impacts the probability of under-reporting budgets, or in other words, if oil wealth is associated with lower levels of fiscal transparency. Thus, the dependent variable in this first empirical exercise is a dummy indicating whether municipality *j* in time *t* declares its yearly-executed budget (equal to 1), and 0 if data for that particular municipality/year is missing.

The main independent variable is also a dummy that equals 1 if the municipality received royalty payments, and 0 otherwise (ROYALTY). Additional controls include size of local population (in logs), levels of local economic development (also in logs) and a measure of electoral competition: the margin of victory, that is, the difference in vote shares between the winner and runner-up in first round elections in municipality *j* during elections under the period of analysis.[75] The logic of inclusion of most of these economic and political controls was discussed in the previous chapter on the determinants of transparency at the cross-national level and we should expect similar dynamics to operate at the local level. However, here I introduce a new variable: the size of local population, to account for the possibility that it may be easier for voters to infer how much revenue the government has when each individual represents a larger percentage of the overall tax base.

[75] Since the period (2000-2009) covers three elections (2000, 2004, 2008), levels of political competition are assigned to each year in the following way: 2000 levels for years 2000-2003, 2004 levels for years 2004-2007, and 2008 levels for 2008-2009.

Table 5.1 presents results from a logistic regression in a panel of yearly data (2000-2009), pooling all municipalities (n=5563) together. Municipal fixed effects are included in all specifications, so the estimates only reflect within-municipality variation.

Table 5.1: Determinants of fiscal transparency in Brazilian municipalities

	1	2	3	4	5	6	7
ROYALTY	-0.766***	-0.903***	-0.828***	-0.707***	-0.514**		
	(0.195)	(0.199)	(0.224)	(0.234)	(0.244)		
Population (log)		-0.206	-0.0863	0.252	1.449**		7.791
		(0.538)	(0.650)	(0.671)	(0.688)		(10.831)
Gdp per capita (log)			-1.335***	-1.370***	0.374		
			(0.181)	(0.194)	(0.377)		
Margin of victory				0.007			
				(0.005)			
ROYALTY PAYMENTS (log)						-3.699**	-3.664**
						(1.722)	(1.763)
Municial fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	N	N	N	N	Y	Y	Y
Observations	2,860	2,820	2,457	2,252	108	108	84
Number of MUNICS	286	282	273	253	16	16	14

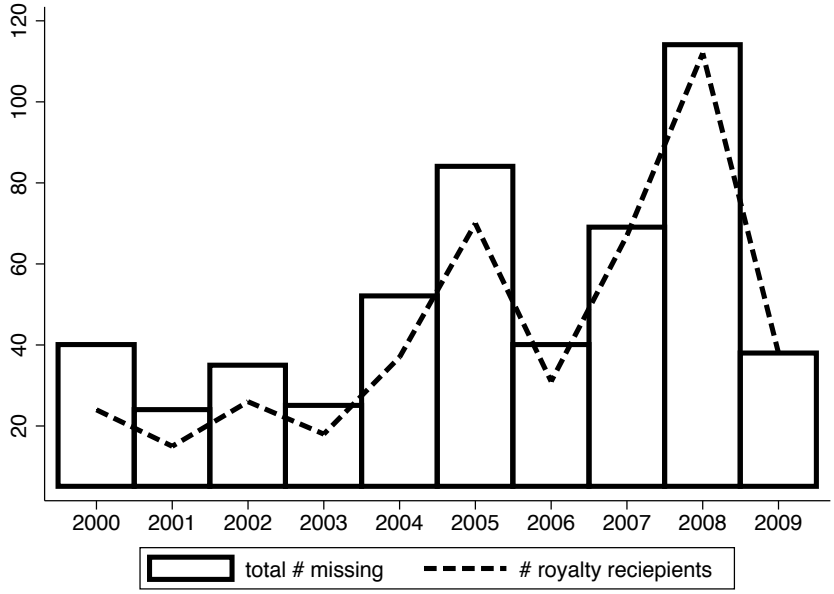
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Levels of fiscal transparency are systematically lower in years when municipalities received royalty payments. Depending on the model of choice in Columns 1-5, the probability of disclosing fiscal information is 6-18 percentage points lower in municipalities benefited from the windfall sometime during the period under analysis.[76] To capture such trends graphically, Figure 5.6 plots the total number of missing fiscal data observations (in bars) and the contribution of royalty recipients to that total (dashed-line) by year. While in 2000 royalty recipients accounted for less than half of total fiscal missing data, in 2008, the peak of the oil boom, 95% of cases can

[76] A recent study confirms this finding using a different data source on royalty payments (De Oliveira 2011).

be attributed to municipalities benefited by oil wealth that year. Clearly, the distribution of missing fiscal data is not random at the local level in Brazil.

Figure 5.6: Number of missing fiscal data by year



It is worth discussing results from the rest of the control variables. For example, in some specifications, the level of economic development sometimes has the wrong (negative) sign but this result is not robust across all specifications. Similar considerations affect the size of municipality variable. Finally, levels of electoral competition, as measured by the vote margin of victory do not seem to affect fiscal transparency once we condition on access to royalty payments.

Additionally, Columns 5-7 in Table 5.1 restrict the analysis to the municipalities of the state of Rio de Janeiro, the largest oil producer in the country, from 2003 (the start of the oil boom) onwards. In this exercise, instead of working with a simple royalty dummy, the key

independent variable is the amount of royalty payments per capita received (in logs) in a particular year (ROYALTY PAYMENTS), in order to compare differences in levels of , such as the Campos vs. Sao Francisco mentioned in the introduction. As with the full sample, the sign of the fiscal windfall coefficient is negative and statistically significant at conventional levels in the Rio de Janeiro sample. In sum, exploiting the fact that municipality's self-declare fiscal accounts and that not all municipalities report them every year, I find that fiscal transparency tends to be significantly lower in oil rich local governments, a finding that is consistent with the cross-country regressions results from previous chapter, and with the theoretical assumption linking non-tax revenue sources to (fiscal) opacity.

5.3.2 Royalty payments and political budget cycles

As noted in the introduction, federal fiscal arrangements create a soft budget constraint at the municipal level in Brazil: local incumbents tend to enjoy a large share of the political benefit of spending but pay only a small fraction of the political cost of taxation. Most of the resources they spend on public goods originate from intergovernmental transfers and/or with some luck, royalty payments. Interstingly, oil windfalls enter the local budget constraint as a purely additive component: they have no offsetting effect on a municipality's other transfers from the state or federal governments. So we should expect these authorities to use such low-cost spending power to remain in office. Electoral years are thus key events where one should observe such behavior played out.

Indeed, the empirical evidence is consistent with the notion that expenditure increases are driven by the electoral cycle in the Brazilian local context (Sakurai and Menezes-Filho 2010). However, less well understood are the sources of variation of this behavior across subnational

units. This section fills this gap by testing the hypothesis that royalty payments exacerbate political budget cycles (PBC). In other words, I test the proposition that the size of the political budget cycle is larger among royalty recipient municipalities, or that, the higher the level of dependence on royalty revenue, the stronger the marginal impact of election years on public expenditure increases.

Empirical strategy. To test this interactive hypothesis, and based on a sample of more than 5000 municipalities between 2000 and 2009, I estimate a dynamic panel model of the type:

$$\log Expend_{it} = \beta_1 ELECT_{it} + \beta_2 \log ROYALTY_{it} + \beta_3 ELECT * ROYALTY_{it} + \beta_4 CONTROLS + \alpha_i + \varepsilon_{it}$$

where *Expend*: total real public expenditures per capita; ELECT is a dummy variable equal to 1 in election years and 0 otherwise[77]; and ROYALTY refers to the ratio of royalty payments to total municipal revenue. Additional controls include: a) Municipal *Gdp per capita* (in logs), b) *Population* (in logs), and c) *Transfers:* Total constitutional transfers relative to municipal revenue (in logs), a lagged dependent variable, and α, a municipal fixed effect.[78] Logging the variables is appropriate given the strong skew in the ROYALTY payments and expenditures variables, so the coefficients from the models can thus be interpreted in terms of percentages. The inclusion of the transfers' variable tries to control for the level of fiscal autonomy of the municipality: higher autonomy (e.g. lower dependence on transfers) may provide the mayor with a bigger ability to manage resources to promote opportunistic spending. Alternatively, one could

[77] During the sample period, local electoral years include 2000, 2004, and 2008.

[78] Year fixed effects are also included in all specification but not reported.

argue that transfers may operate as another type of alternative revenue source, providing a motivation and means to engage in political budget cycles.[79]

Results. Table 5.2 reports the coefficients and robust standard errors (clustered by municipality) from estimating equation 1 using OLS fixed effects and GMM-Arellano and Bond (1991) estimators. The latter estimation procedure is needed since in the presence of fixed effects, the equation above is estimated in differences. While first differencing gets rid of the municipality specific effects, it leads by construction to a correlation between the differenced lagged fiscal variable and the differenced error term. Thus, the one-step GMM estimation procedure suggested by Arellano and Bond (1991) is called for, which consists in using lagged levels of the explanatory variables (including the lagged dependent variable) as instruments.

[79] An electoral competition variable (the margin of victory) is not included in these models since they were found insignificant in previous specifications and therefore dropped from the analysis.

Table 5.2: Political budget cycles in municipalities: total expenditures per capita

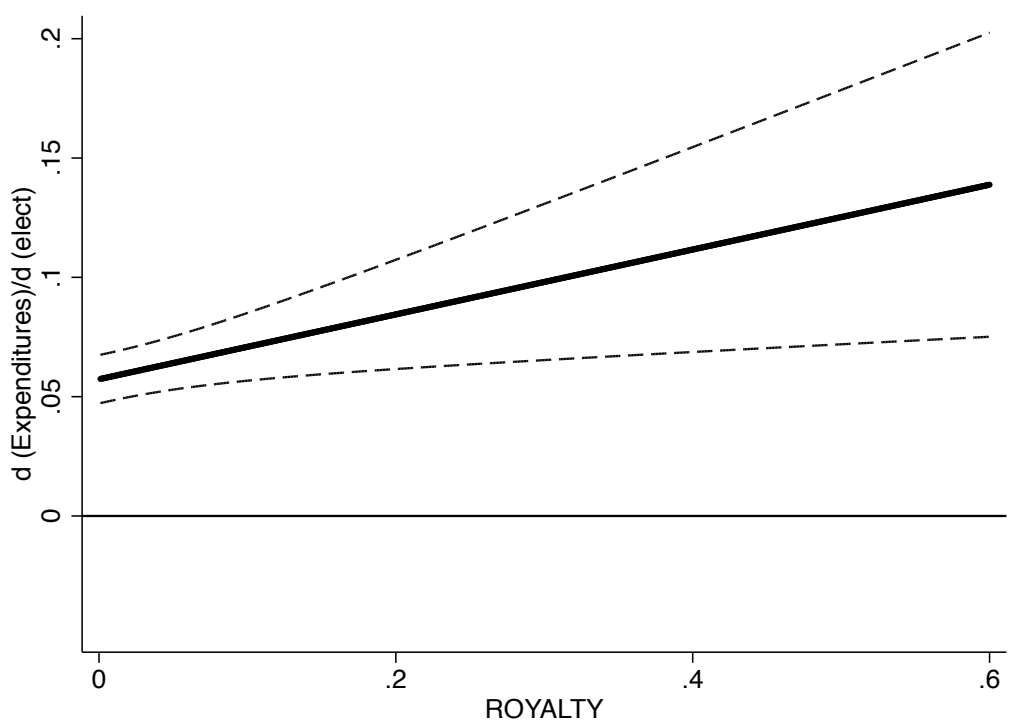
	Fixed Effects	GMM
	1	2
Elect	0.057***	0.0207***
	(0.005)	(0.002)
ROYALTY	0.831***	0.220
	(0.096)	(0.139)
Elect * ROYALTY	0.136**	0.128*
	(0.054)	(0.0665)
Transfers	-0.417***	-0.708***
	(0.021)	(0.0133)
Transfers * Elect	-0.0737***	0.0357***
	(0.008)	(0.0132)
Gdp per capita	0.117***	0.228***
	(0.009)	(0.00624)
Population	-0.498***	-0.135***
	(0.020)	(0.0223)
Lagged DV	0.171***	0.801***
	(0.024)	(0.0126)
Observations	41,454	35,335
YEAR FE?	YES	NO
Number of MUNICS	5,549	5512

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

According to the coefficients in Model 1, real per capita public expenditures increase by 6% in electoral years on average, but this effect varies as a function of the level of dependence on royalty payments. For a municipality in which royalty payments account for 20% of total revenues, public spending increases by 8% in electoral years. However, when this level of dependence reaches 80% of the budget, the boost in public spending during electoral years is 14%, that is, an effect more than two times the size of the coefficient for municipalities that do not receive royalty payments. As shown in Figure 5.7, the marginal effect of elections on public

spending *increases* for each unit increase in the level of rent dependence. The conditional relationship between elections and royalty payments is robust to the method of estimation: the GMM estimates suggest effects of a similar order of magnitude to the fixed effects model. These results are consistent with our theoretical expectation that from a supply side perspective, incumbent local politicians should use their low cost spending power (oil rents) to remain in power and attract voters via public spending.

Figure 5.7: Marginal effect of Elections, with 95 percent confidence interval (Model 1)



In addition to affecting overall *levels* of public spending, do incumbents manipulate the *composition* of the budget as well during electoral years?[80] To answer this question, I introduce

[80] See Drazen and Eslava (2010) for an analysis of this issue in the Colombian context.

two new fiscal instruments as dependent variables: the log of current expenditures[81] per capita, and the log of investment expenditures (e.g. infrastructure and machinery) per capita; and split the sample into royalty recipients and non-royalty recipients. The current vs. capital expenditure divide is a common way of classifying budget items in official public accounts, and in the context of the budget cycle literature, an important question is whether incumbents try to shift the budget toward expenditures that are most valued by voters (Drazen and Eslava 2010).

Table 5.3 presents results from the standard GMM Arellano and Bond dynamic panel approach with two lags of each endogenous variable. In addition, I introduce total spending per capita as a control so that the coefficient on the electoral variable can be interpreted as the election year effect on the share of spending in each budget category. The results show a systematic change in the composition of the budget in electoral years, especially among royalty recipient municipalities.

[81] Whose main components are first the wage bill (salaries to government employees) and then the purchase of supplies.

Table 5.3: Effect of elections on the composition of total expenditure

	Royalty reciepents		Rest of municipalities	
	Current exp.	Investment exp.	Current exp.	Investment exp.
	1	2	1	2
ELECT	0.195***	-0.178***	0.00874	-1.901***
	(0.0144)	(0.0550)	(0.00638)	(0.263)
Transfers	0.113***	-0.719***	0.214***	-0.0418
	(0.0183)	(0.164)	(0.0255)	(0.384)
Transfers * Elect	-0.00538	-0.0260	0.00803	0.0600
	(0.00823)	(0.0621)	(0.00779)	(0.0612)
Gdp per capita	0.0164*	-0.301***	0.0276***	-0.329***
	(0.00991)	(0.101)	(0.00445)	(0.0443)
Population	-0.937***	1.240***	-0.989***	3.739***
	(0.0265)	(0.340)	(0.0133)	(0.520)
Total spending	0.672***	2.919***	0.752***	5.924***
	(0.0241)	(0.209)	(0.0407)	(0.651)
Lagged 1.DV	-0.0669***	-0.315***	-0.0876***	-0.253***
	(0.0138)	(0.0235)	(0.00814)	(0.0159)
Lagged 2. DV	-0.0222*	-0.177***	-0.0400***	-0.129***
	(0.0117)	(0.0205)	(0.00686)	(0.0122)
Observations	4,158	4,213	24,429	24,727
Number of MUNICS	856	883	4,493	4,656

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In local governments that are royalty recipients, the budget share of current expenditures increases by 20% during electoral years, while no effect of this sort is evident across the rest of municipalities. On the investment side of the budget, both types of municipalities tend to significantly decrease this type of expenditure during elections: in the case of royalty recipients, they do so in an order of magnitude similar to the current expenditure increase. Interestingly, a similar effect is obtained when looking at the behavior of the *Transfers* variable, suggesting that

there may be common uses of both types of revenues given their similar collection technologies (in both cases the mayor does not pay the political cost of collection).

The findings on increased public employment spending and corresponding reductions in investment expenditures as shares of total budgets during election years should be placed against the fact that municipalities are in principle forbidden to use royalty income to hire employees on a permanent basis, and that infrastructure takes time to provide public/private benefits and visible outcomes. This picture is consistent with theoretical accounts that link resource abundance to (a) increasing motivation for incumbents to create government jobs and rely on patronage to stay in power (Robinson et al. 2006) and, (b) a reduction in their time horizons and thus, fewer investments in long-run public projects (Caselli 2007).

5.3.3. Electoral returns of local public spending

The evidence thus far shows that the positive impact of elections on levels of public expenditures is larger among municipalities that are royalty recipients. In other words, the size of the political budget cycle increases in the presence of windfall revenue. The natural follow up question is whether such opportunistic spending increases lead to better electoral outcomes for the incumbent (or her copartisan).[82] Thus, the goal of our final empirical exercise is to estimate the electoral effects of local public spending cycles by studying the impact of election year expenditures on the vote share and probability of reelection of incumbent mayors or a successor of the same political party.

[82] For recent contributions on the subject exploiting subnational variation, see Sakurai and Menezes-Filho (2008), Litschig and Morrison (2010) on Brazilian municipalities, and Jones et al (2012) on Argentine provinces.

To do so, I restrict the analysis to the subset of *coastal* municipalities located within the nine producing states of Brazil.[83] As explained in the introduction, the recent oil boom in Brazil has been largely an off-shore phenomenon. Since the rules for allocating royalty payments from off-shore production are based on geographic criteria, windfall revenue is concentrated on some municipalities across the Brazilian coast (see Figure A5.2 Appendix). As argued in Ferraz and Monteiro (2010), such rules make explicit the fact that conditional on being on the coast, the status of being a royalty recipient is quite random, providing a sample of municipalities that are mostly similar on a number of important covariates and thus suitable for this type of comparison (see Ferraz and Monteiro 2010, Table 4).

Empirical strategy. Using information from the 1996, 2000, 2004, and 2008 municipal elections, the basic equation(s) to be estimated is the following:

$$Y_{it} = \alpha_i + \beta_1 \log EXPEND_{it} + \beta_2 POLITICAL\ CONTROLS_{it} + \beta_3 ECONOMIC\ CONTROLS_{it} + \varepsilon_{it}$$

where Y_{it} is (1) the percentage of votes obtained by the incumbent mayor or his/her political party of the local election t in municipality i; and (2) equal to 1 when the mayor or his/her party is reelected and 0 otherwise.

Among the political controls, I code political parties on the ideological spectrum as left, center, or right wing following the classification in Sakurai and Menezes-Filho (2008; 2010). In addition, I introduce a dummy variable that assumes value 1 if the mayor's party belongs to the president's coalition (0 otherwise). In particular, two different governing coalitions are

[83] Ceara, Rio Grande do Norte, Alagoas, Sergipe, Bahia, Espirito Santo, Rio de Janeiro, Sao Paulo, and Parana. The definition of coastal municipality is given by the Brazilian National Statistical Institute (IBGE) and data on coastal municipalities is also available from IBGE.

considered: the presidency of Fernando Henrique Cardoso (FHC) from 1995 to 2002, and the presidency of Luiz Inacio Lula Da Silva (Lula) from 2003-2010. Economic controls include levels of municipal GDP per capita (in log) and total population (in log) in each municipality. The key coefficient of interest is β_i capturing the effect of election year real expenditures per capita on electoral success. Finally, α_i is a municipality specific effect that depending on the model at hand, is assumed either fixed or randomly distributed.

Results. Table 5.4 presents the basic results: since the dependent variable in Columns 1 and 2 is the vote share of incumbent mayor or party, models are estimated by OLS. In Columns 3 and 4, the dependent variable is the reelection dummy, so the equation is estimated using Logistic regression. Given that a Hausman test comparing the fixed vs. random effects failed to reject the null-hypothesis that RE provides consistent estimates, I concentrate most of the discussion on the latter type of models.[84]

[84] For Columns 1 and 2, a test of RE against FE yields an overall χ^2 statistic with *p*-value=0.30. The corresponding figure for columns 3 and 4 is 0.93.

Table 5.4: Electoral effects of public spending across coastal municipalities

	OLS		Logit		
Dependent variable:	Vote share Incumbent		Reelection		
	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Marginal Effects
	1	2	3	4.1	4.2
EXPENDITURE	14.53**	8.595***	1.310	0.878**	0.194**
	(6.730)	(3.322)	(0.913)	(0.385)	(0.085)
GDP per capita	-7.143	-2.648	-0.992	-0.204	-0.045
	(5.464)	(2.403)	(0.775)	(0.271)	(0.059)
Right	10.31	3.008	0.828	0.760*	0.143**
	(6.362)	(3.996)	(0.843)	(0.451)	(0.066)
Center	12.20**	6.780**	1.100*	0.713*	0.171**
	(5.111)	(3.404)	(0.583)	(0.382)	(0.092)
Governing coalition FHC	-1.726	-1.400	-0.434	-0.292	-0.067
	(4.321)	(2.554)	(0.550)	(0.297)	(0.068)
Governing coalition Lula	8.673	3.198	-0.256	-0.396	-0.092
	(6.108)	(4.148)	(0.758)	(0.466)	(0.113)
Population	-12.53	0.751	0.502	0.0825	0.018
	(10.62)	(1.044)	(1.482)	(0.116)	-0.025
Constant	129.8	-3.261	-12.13	-5.402***	
	(110.3)	(18.02)	(300.5)	(2.084)	
Observations	272	272	153	273	273
Number of MUNIC	127	127	61	127	127

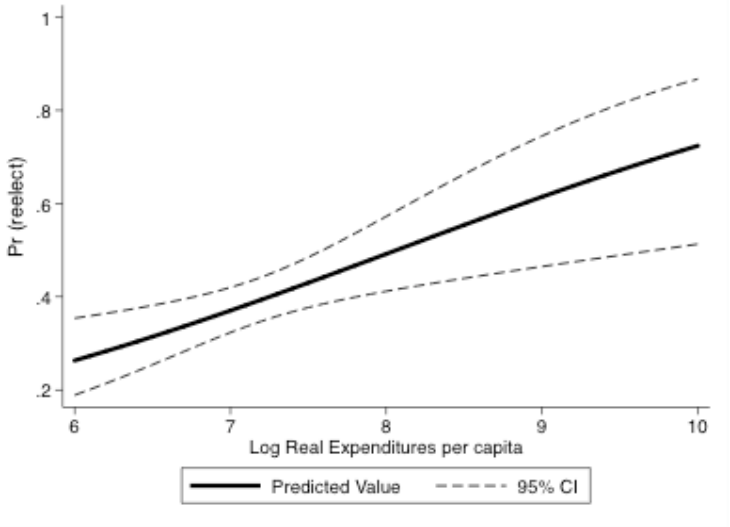
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results from Model 2 show that holding economic and political controls constant, a 1% increase in real per capita government expenditures boosts the vote share of the incumbent mayor or her party by 9%. Given that the average margin of victory for the full sample of municipalities in the four elections between 1996 and 2008 was 16%, the size of this coefficient is far from being negligible.[85] Model 4 (Column 4.1) presents estimation results for the

[85] Margin of victory denotes the difference in vote shares between the winner and the runner-up in first round elections. Election-year specific margins of victory are as follows: 14.5% (1996), 16% (2000) 14% (2004), 18% (2008).

probability of electoral victory. As with the vote share, results show a significant positive impact of EXPENDITURE on the probability of reelection. To interpret the substantive meaning of this result, Column 4.2 shows the coefficients of Model 4 in terms of marginal effects: additional government expenditures by the incumbent mayor or party increase the probability of retaining the municipality by 19 percentage points. Finally, Figure 5.8 shows how the probability of victory varies (e.g. increases) across the range of the EXPENDITURE variable, while holding all other co-variates at their mean or modal values for categorical variables.

Figure 5.8: Predicted probability of reelection as a function of spending



Conclusion

Taking advantage of a dramatic increase in royalty payments transferred to some Brazilian municipalities during the 2000s, and using disaggregated local finance data, this chapter looks at the impact of revenue windfalls on levels of fiscal transparency, size of political budget cycles, and the electoral effects of public spending. Several findings of interest are obtained, including: (1) Levels of fiscal transparency are systematically lower in oil benefited municipalities: the

probability of not declaring public finance data is reduced by up to 18 percentage points when a municipality receives royalty payments in a given year.

(2a) The size of the political budget cycle is more than twice as large in municipalities that are highly dependent on windfall revenue ("petro-rentistas"). In light of finding # 1, the observed budget cycle effect could be interpreted as a lower bound on the real impact of elections on public expenditures in the presence of oil wealth.

(2b) An opportunistic shift in the composition of government expenditures occurs in oil benefited municipalities: while the share of long term investment projects in total spending goes down, current (payroll) expenditures increase as share of the total budget during electoral years.

(3) Finally, voters reward incumbent politicians who increase public spending in electoral years: their probability of reelection goes up by about 20 percentage points for additional government expenditures.

These findings complement the cross-national empirical exercises of the last two chapters. Putting the cross national and subnational findings together, the results provide evidence that the mechanisms specified by the theory tend to play out in similar terms across different government level units. First, fiscal transparency tends to be lower in places (e.g. municipalities, countries) that are benefited by non-tax revenue sources, and the size of political budget cycles tends to be larger when incumbents (e.g. mayors, presidents) can count on such low cost spending to remain in power.

Additionally, these findings speak directly to on-going debates about the new governance structure for the sharing of royalty payments across Brazil. The political and legislative debate has focused so far on the distributive aspects of the new legislation: that is, whether royalties should be redistributed amongst all states and municipalities to replace the current system where

only “producing” states and municipalities take a bite. Adherents of the status quo have few pieces of evidence to support their argument. In fact, previous studies at the level of Brazilian local governments have shown that fiscal windfalls are associated with low tax effort (Postali and Queiroz 2010), bloated public sectors (Ferraz and Monteiro 2010), and relatively few improvements in living standards (Caselli and Michales 2009). This chapter adds to the number of perverse outcomes generated by windfall wealth that of low levels of fiscal transparency, and opportunistic budget manipulations around election times. Taken together, these findings suggest that regardless of whether royalty payments are universalized or remain targeted, a governance structure based on an audit system that reports how fiscal windfalls are being spent by incumbent politicians should be in place. Back in the early 2000s, the federal government launched an anticorruption program based on the random auditing of local governments expenditures that are financed by federal fiscal transfers and funds with relative success. An extension of such program that includes the auditing of fiscal windfalls seems warranted in light of the facts presented in this paper and other pieces of evidence from the specialized literature.

Finally, this paper highlights the need for advancing the research agenda on at least two fronts. First, in light of the transparency findings, work on how **information** can enhance voter awareness about the total size and use of windfall revenue becomes particularly salient. Indeed, surveys conducted during 2003 and 2004 in Campos dos Goytacazes, the municipality mentioned in the introduction as being one the largest royalty recipients, suggests that voter awareness about the availability and nature of royalty payments was relatively low. While a majority of voters could tell that Campos was a resource rich municipality, very few knew about royalty payments specifically, and a substantial majority tended to under-estimate the size of the

fiscal windfall available to the local government.[86] In this context of large information asymmetries, opportunities for rent-seeking (corrupt) behavior on behalf of incumbents tend to expand. It is thus no surprise to find that events such corruption scandals, with incumbents being accused and ousted from office for misuse of public funds are recurrent feature of the political scenario among top-benefited local governments (Caselli and Michael 2009; Ferraz and Monteiro 2010). In addition, recent evidence based on natural (Ferraz and Finan 2008) and field (Winters and Weitz-Shapiro 2010) experiments suggests that the impact of disclosing information on electoral behavior, voting attitudes, and electoral outcomes are significant both at the municipality and individual level, respectively.[87] Thus, future work could explore the effects on electoral behavior of offering more information to voters about windfall revenue and its use by incumbent politicians. Does providing additional information about how governments spend resources affect voter choices, by for example, leading to the punishment of corrupt mayors at the polls? These are questions where further research is definitely needed.

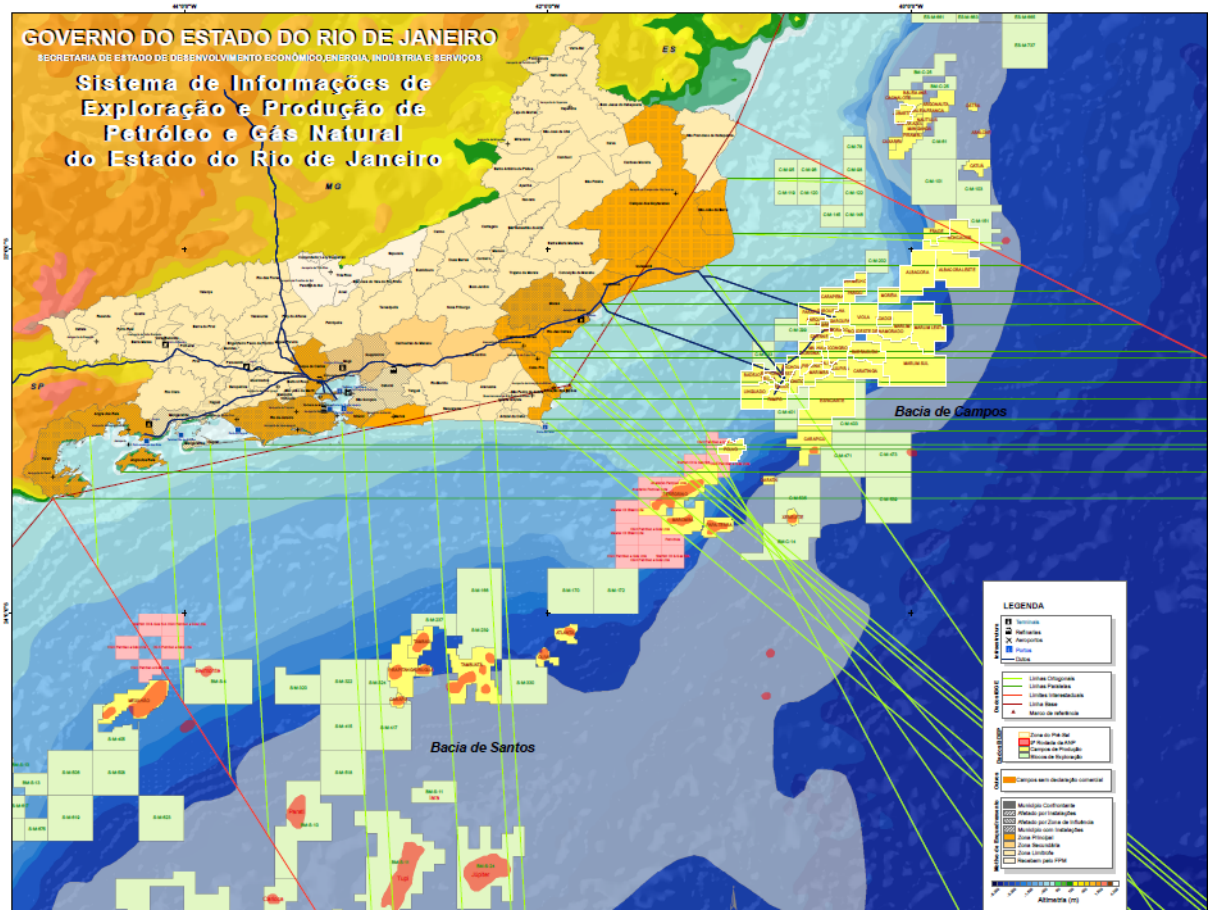
Finally, by exploiting local level variation in access to windfall wealth, one can study the efficient use of public expenditures in oil benefited and non-benefited municipalities. While previous research suggests that public expenditure levels of all types increase in the former, we still lack an assessment of how such input levels relate to outputs. At the same time, with the release of information on audit reports on corruption, one may be able to analyze the incumbent's allocation decision between corruption and public good provision more cleanly.

[86] See Boletim Petróleo, Royalties e Região, June 2004, Available at http://www.royaltiesdopetroleo.ucam-campos.br/index.php?cod=1

[87] See also Chong et al. (2011) for a field experiment along these lines in Mexico exploring the effects of an information campaign about local level expenditures on turnout.

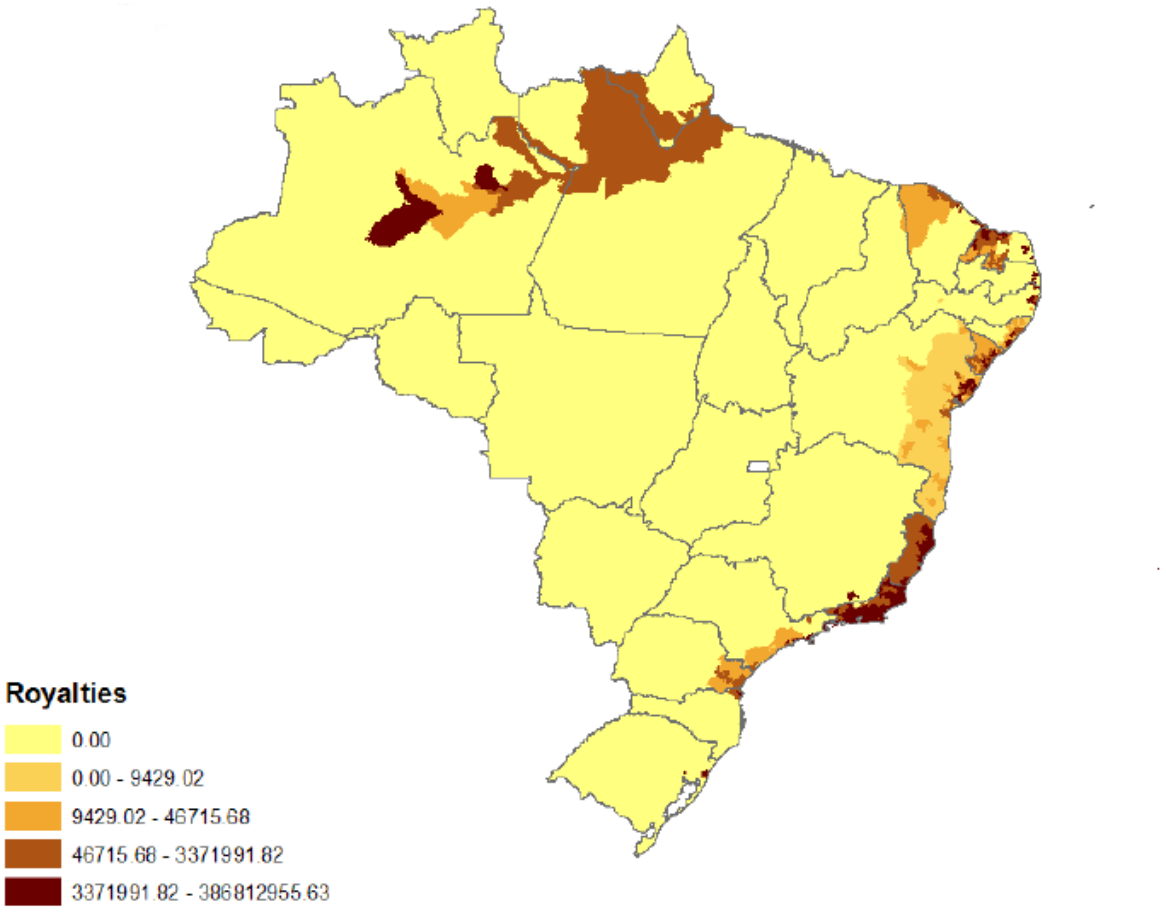
Appendix 5.1

Figure A5.1: Parallel and Orthogonal lines (Rio de Janeiro state's coast)



Source: http://www.petroleo.rj.gov.br

Figure A5.2: Coastal municipalities and royalty payments (2007)



Source: Cruz and Ribeiro (2008)

Conclusion

In this dissertation, I set out to explain variation across countries and over time in the behavior of fiscal policy over the business and electoral cycle. Two stylized facts motivate the analysis: fiscal policy in developing countries is procyclical and the size of political budget cycles larger than in developed democracies. Previous scholarship has studied the determinants of these phenomena in isolation.

Thus, a first contribution of this dissertation is to present a unified theory of fiscal policy behavior that embeds these two findings within a common principal-agent framework of public finance. In this framework, policy is not chosen by benevolent social planners, as in normative analysis of welfare economics, but by rent-seeking politicians, who make tradeoffs between the amount of resources diverted to private uses and the provision of public goods that enhance their chances of reelection, and the voters that condition their electoral support on incumbent's policy performance.

Voters play a fundamental role in the theory. Unlike most of the existing literature, where interest group competition over public resources occupies the core of the theoretical attention, my argument concentrates on the incentives of voters to demand public spending under different informational regimes. The argument is however, not based on a preference-based explanation of fiscal policy, in which voters in developing countries, because of their relative poverty, simply demand more public spending than voters in the developed democracies, as a standard median voter framework would predict. Instead, the theory builds on the notion of informational asymmetries regarding public accounts between politicians and voters, and between voters across different types of political systems.

In particular, the flow of information that voters receive about public budgets is not exogenous but derived from particular revenue foundations. The main assumption of the theory is that governments that rely on fiscal windfalls (such as oil royalties or foreign aid) are less transparent than democracies that fund most of their spending with general taxation. Two reasons underlie this assumption: the revenue collection technology, and the incentives of incumbents to reveal information in different economic scenarios.

First, fiscal windfalls accrue directly to government coffers, without any need of private collection from citizens, which make it hard for voters to infer how much total revenue the government counts with. Secondly, incumbents in windfall environments have incentives not to produce the most transparent budget procedures, since the asymmetry of information can be used for their advantage, by for example providing a minimum level of public goods that would satisfy rational but uninformed voters, while at the same allocating the rest of the windfall on private rents. This incentive to be opaque in the fiscal process is especially prevalent when economic conditions are good, and thus, room for rent seeking is widespread.

In the context of such an opaque informational regime, the theory posits that voters' rational response to the incumbent's strategy is to raise their reservation utility in the form of higher public spending demands. Such demand, while procyclical, is the best the voter can do in order to try to tie the hands of rent seeking incumbents during good times, and the politician interested in reelection will have to satisfy this new reelection constraint if she wants to remain in power. As a result of this interaction, we should observe more procyclical fiscal policy and a political budget cycle when fiscal windfalls represent an important share of total fiscal revenue.

The above theoretical framework can be used to interpret two of the main findings of this dissertation: 1) countries that are relatively more dependent on fiscal windfalls (as measured by

the share of fiscal revenue from mineral and oil sources) tend to show procyclical fiscal policy (chapter 2); 2) democracies that rely on non-tax revenue sources (as measured by the share of total revenue from oil, foreign aid grants, and other non-tax instruments) tend to engage in political budget cycles; while non-rentier democracies behave differently (chapter 3). Thus, a second contribution of this dissertation is the proposal of a new set of explanatory variables (tied to a country's structure of public finance) to account for variation in well-studied policy issues, such as procyclicality and the opportunistic manipulation of the budget around election times. Previous contributions have generally ignored the role of the structure of public finance when explaining such important policy phenomena.

In addition to the previous findings, two empirical chapters have provided initial support for the main working assumption of the theory: that voters should be less informed about public budget when windfalls represent an important component of public accounts. Consistent with this notion, the existence of a negative relationship between windfalls and transparency is present in the data both across countries (chapter 4), and across subnational units within a country over time (chapter 5). In studying the determinants o voter's access to public information on budget procedures, this dissertation joins the handful of studies that take the endogeneity of fiscal transparency seriously.

Finally, I have tried to add to an emerging literature on the informational implications of different types of fiscal revenue on governance outcomes (Caselli and Michales 2009; Gadenne 2011; Paler 2011). Most previous contributions have looked at these issues in single country settings with novel identification strategies. This dissertation has offered a first attempt at exploring such implications in a cross-national context. Having summarized the main

contributions of the project, I end the discussion with some policy lessons learned and outline next steps in terms of a research agenda.

Policy implications

The main message of this dissertation is that *how* governments are financed, and in particular, how much taxes they collect, matters a lot for understanding the behavior of public spending across the business and electoral cycle in developing countries. It thus identifies the conditions that emerge as favorable for fiscal policy to perform its stabilization function effectively. However, the international community has in general tended to address the procyclical bias with fiscal policy rules, in the hope that the passing of a fiscal responsibility law (FRL) or a cyclically adjusted balance (CAB) would make policy more predictable and credible (Balassone and Kumar 2007b).

A first implication of this study is that such rules are no substitute for political consensus around prudent fiscal policy. In particular, I have argued that in the absence of a political constituency in favor of fiscal prudence, policy will be procyclical, regardless of whether a formal fiscal rule reducing political discretion is in place or not. Indeed, while there is ample empirical evidence suggesting a correlation between budget rules and good fiscal performance[88], it is difficult to establish causality, since across the countries that tend to adopt them, the turnaround in policy behavior often occurs before their implementation (Corbacho and Schwartz 2007). In addition, empirical exercises on the determinants of procyclicality show that measures of fiscal rules become insignificant once deeper politico-institutional variables are included in the analysis (Manasse 2006).

A second implication of this research is that developing countries, in the absence of tax

[88] See references on chapter 4.

revenue mobilization efforts, should at least aim to increase transparency in order to improve fiscal outcomes. By exploring the informational implications of different types of revenue sources, this research tries to go beyond traditional resource curse arguments in specifying similarities between different types of fiscal windfalls that do not necessarily derive from natural resource wealth. Because of their collection technology, oil royalties, foreign aid, and intergovernmental fiscal transfers share a common trait: they are all susceptible to (lack of) transparency problems. From this perspective, this research speaks not only to debates about how to manage fiscal policy over the business cycle, but also concerns about the mechanics of foreign aid allocation and its integration with national budgets, as well as trends toward (fiscal) decentralization in the developing world.

Research agenda

The theory developed in chapter 1 posits that under a certain structure of public finance and thus, a corresponding informational regime, voters are more or less likely to make procyclical demands. In the abscence of cross-country survey data on citizen's public consumption smoothing preferences[89], I have tested the argument in a reduced form by using available cross-national and subnational data. However, to help put the argument on firmer footing, it is important to move towards a micro-level analysis that would ideally complement the cross-national and subnational findings presented here. One potential avenue of future research is thus the design of surveys or field experiments that would allow to answer questions such as the following: does providing information about government's budgets affect voter's

[89] For U.S data, see Shiller (1997) who reports that among the 80% of Americans who agree with the statement that preventing recessions is an important policy prerrogative, 83% endorse the importance of counter-cyclical policy even if 'the method of preventing economic recessions had an absolutely equal impact on economic booms by preventing really good times just as much as it prevented really bad times. For evidence on voter aversion to business cycle volatility also in the U.S, see Wolfers (2003).

demands for public goods over the economic cycle? Similarly, in the context of an informational campaign across local governments with acces to windfall rents, one could asses whether electoral behavior changes when voters are provided with information about the levels and use of windfall revenue by incumbent politicians.

Moving beyond microfoundations, another potential avenue of research is to exploit the theoretical differences between windfall and tax revenue developed here to study other outcomes of interest, both at the national and subnational levels. In particular, recall that from the principal-agent framework, a politician, given a certain budget constraint, makes allocation decisions between the provision of public goods and the diversion of funds for personal gains (rents). Thus, future research should attempt at measuring these two components and asses the extent to which taxes and windfalls affect the overall quality of public spending. While cross-nationally the measurement problem is acute, at the subnational level the undertaking seems more plausible. In the Brazilian context, for example, several studies have developed original measures of the extent of corruption by taking advantage of publicly available audit reports on expenditure behavior at the local level (Litschig and Zamboni 2008; Ferraz and Finan 2008; 2011; Brollo et al. 2010). The corruption data, together with the development of measures of public expenditure efficiency, provide an opportunity to extend this research to study whether the quality of public spending is affected by access to windfall revenue.

Final remarks

Students of fiscal policy often tend to cluster in two separate groups: those that study tax revenues or tax administration on one side, and the ones that focus on public expenditures on the other. This dissertation has tried to bridge this gap by exploring both theoretically and

empirically the impact of how democratic governments finance themselves (taxes vs. windfalls) on expenditure behavior over the business and electoral cycle. The dissertation is inspired by a central question in comparative political economy: how do countries, through their political institutions, decide to adjust fiscal policies in response to economic shocks? More often that not, scholars have tried to address this puzzle by recurring to factors outside the fiscal system, such as for example levels of institutional development. In contrast to this tendency, I have argued that the answer may not lie far behind the fiscal realm. Looking at the sources of government fiscal revenue can go some way in explaining how voters and politicians interact in deciding how to smooth (or not) public expenditures across the business and electoral cycle.

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