

## CHAPTER 8

---

# The Political Economy of Natural Resource Funds

**Macartan Humphreys and Martin E. Sandbu**

### ABSTRACT

The economic case for natural resource funds is surprisingly weak. There is, however, an important political rationale for resource funds. In this chapter, we show theoretically that the importance of natural resource funds (NRFs) lies in the effects that they have on the incentives facing political actors. Our theoretical analysis is supported by empirical work on institutions and expenditure decisions. If, as is sometimes the case, NRFs do not substantially affect political incentives then they can be ignored or bypassed by governments and have no beneficial effect. To be effective, we argue that (1) withdrawal decisions should be regulated in part by clear rules rather than general guidelines, (2) key decisions should be made by bodies representing the interests of diverse political constituencies, and (3) there should be high levels of transparency regarding their status and operation—in particular there should be a unified budgetary process and public reporting of payments, holdings, and investments. However, we emphasize that in all cases the impact of the institutional details will depend on the extent to which they alter the incentives facing political actors. We identify a series of ways to ensure that these provisions are correctly aligned with political incentives, including ways in which institutional strength can be “imported” from third parties.

### INTRODUCTION

Despite popular belief in their utility, research on natural resource funds does not find evidence that funds lead to better management of natural resources (Davis et al. 2003; Fasano 2000). Natural Resource Funds (NRFs) are employed in countries that use revenues well, but they are

also employed in countries that use them badly. While they may restrain government overexpenditure in some cases, in other cases, fund rules are changed or the NRFs themselves are raided when governments wish to increase expenditure. In cases where there appears to be a positive relationship between the presence of NRFs and expenditure smoothing, it is not clear that the NRFs themselves, rather than other features of a country's political system, are responsible for the policy choices. Norway, for example, is often cited as a country with a highly effective NRF, yet inferring a causal effect for the Norwegian case is difficult: the restrictions imposed upon policy makers by the Norwegian fund are extremely weak.<sup>1</sup> In contrast, much effort went into ensuring that Chad put in place a fund for future generations, as a precondition for World Bank financing of the Doba oilfield developments and the Chad–Cameroon pipeline. But despite the fund, Chad remains one of the most corrupt and least democratic countries in the world, and as recent experience has shown, the government felt free to simply change the rules when it wanted greater access to the oil revenues. These facts then create a puzzle: what features, if any, of a natural resource fund might lead to beneficial changes in economic policy choices?

To confront this puzzle, we draw on recent research in the political economy of policy making. This research studies the incentives that face policy makers in different institutional environments and examines how these incentives affect the choices that policy makers take. Our analysis suggests that one reason for the poor empirical relationship between NRFs and effective policy is that the economic logic used to justify the use of NRFs does not, by itself, show that NRFs are necessary. Good expenditure policies can be adopted with or without formal NRFs. More important than the economic rationale are political economy considerations. We address the question of whether resource funds are useful by analyzing how political incentives influence key decisions regarding how much to accumulate. Setting up a natural resource fund does not automatically change the political economy incentives for “misbehavior.” The potential value of an NRF lies instead in the details of a fund's institutional procedures and on *how these affect the political incentives facing policy makers*. An NRF is useful only insofar as it improves these incentives; if incentives remain unchanged the NRF will not contribute to better fiscal management and might even make matters worse by adding complexity and reducing transparency.

The crux of our argument is the following. A crucial reason for the inability of policy makers to save windfall revenues for the future is that

they risk losing control over how money will be spent at a later time. If a new government can come to power and dramatically alter the way the money is spent, an incumbent policy maker has an incentive to spend more money now, *even if he himself* would also prefer to smooth spending out over future time periods. This means that some compromises that benefit all political factions are in principle possible although in practice they do not get made. These compromises would require potential future governments to desist from changing policy too much, and this would induce incumbent governments to save more for the future. The problem is in getting policy makers to commit now to implementing more moderate policies in the future. Such commitments are made possible by political institutions. If Norway manages to save most of its oil revenues, it is because the general institutional environment (and not just the oil fund) endows the politics with a high degree of predictability (below we present more general empirical findings to this effect). In countries with weaker governing systems, the challenge is to build institutional mechanisms for commitment and predictability. This point is certainly much more general than the question of whether or not to have an NRF; it goes to the heart of state-building. Our more modest focus is on whether and how the occasion of setting up an NRF can be used to make incremental improvements to the institutional structure of a country's political economy. In doing so, we emphasize the risk that the goals that an NRF is set up to achieve may come to naught if the political incentives work against them.

We argue, therefore, that it is crucial for designers of natural resource funds to take into account the political economy context within which the resource fund is to be set up. Although this context is unique to every country, we aim to illustrate various types of political economy effects that are likely to operate quite generally, and show how they create incentives against the prudent management of natural resource wealth. How these effects play out "on the ground," as well as their relative importance, is something that can be determined only with local knowledge. Our aim is to show policy makers an inventory of effects that could be at work, and encourage them to identify the specifics of these effects in their local context.

In the final section of this chapter, we suggest a series of ways to mitigate such harmful incentives. We emphasize a role for joint decision-making or separation of powers in withdrawal or spending decisions, and a high level of transparency in fund operations. A number of these solutions,

for which we provide a social-scientific rationale in this chapter, are taken up again in chapter II, which provides further detail on the legal aspects of achieving the goals we set out here.

### ECONOMIC CASE FOR ACCUMULATION AND NATURAL RESOURCE FUNDS

The economic arguments usually advanced for natural resource funds (NRFs) do not, in fact, provide a rationale for new government institutions. Instead, they provide an argument for the principle of *expenditure smoothing*. The argument runs as follows. In low- or middle-income countries (and a small number of high-income countries) whose main exports consist of fuel or mineral resources, governments often face revenues that are both large (as a share of the country's economy or compared to the government's other sources of public revenues) and extremely unstable. The instability of natural resource rents derives in the short run from the high volatility of world commodity prices, and in the longer run from the fact that natural resources are depletable and therefore cannot be exploited in perpetuity. These features create a special problem for fiscal policy,<sup>2</sup> as volatility in expenditures is generally suboptimal. Public spending yields "diminishing marginal benefit"—the social gain from spending more than the long-term average in some years is not great enough to outweigh the social cost of having to reduce spending below the average in other years.<sup>3</sup> Such boom–bust patterns, however, are a nearly universal experience in commodity-dependent economies.

This has several important implications. One is that spending should be stabilized and should not track revenues closely. Another is that temporarily large revenues—such as those deriving from depletable natural resources—ought to be saved so as to also benefit future generations. Natural resource funds are often set up with one or the other of these as the main goal, and the detailed accumulation and spending rules designed accordingly. Indeed, NRFs are often labeled "stabilization funds," "savings funds," or "future generations funds." The general principle behind both stabilization and saving is the same. When revenues are front loaded, as is usually the case with natural resource revenue streams, a policy of constant public expenditures does double duty, as it fulfills both a savings function and a stabilization function.

This is not the place to debate the details of the economically optimal spending path, about which there can be reasonable disagreements (see

chapter 7 and Engel and Valdés 2000 for several views). The main point to note is that the optimal pattern of public spending is *independent* of the shape of the revenue stream. The implication is that the public administration in such situations must manage the mismatch between incomes and expenses: It must, so to speak, save in plentiful years to compensate for meager years. The difficulty of this challenge is illustrated by the dramatic failures of most natural resource-rich countries once the meager years set in.

The need to separate the pattern of spending from the pattern of income means that good fiscal policy in countries with large natural resource wealth typically involves accumulating large amounts of revenues for future use. In a notional sense, therefore, natural resource-rich countries should always have a “fund,” meaning simply that they should have a stock of accumulated savings, to be drawn down when the natural resource revenues dry up. Nothing in this economics argument, however, requires that the natural resource monies be administratively separated in any way from other government assets, as a formal NRF does. In other words, there is no *economic* need for new institutions or rules governing the accumulation of revenues—there is just a need for accumulation according to some optimal policy.<sup>4</sup>

Nevertheless, several countries have sought to tackle the fiscal policy difficulties precisely by establishing formal NRFs. The experience with NRFs goes quite far back; Kuwait’s General Resource Fund for example was established in 1960, and Kiribati’s Revenue Equalization Reserve Fund for phosphate revenues was established in 1956. Many currently active NRFs have been in existence for several decades—two examples considered relatively successful are the Alaska Permanent Fund (established in 1976) and the Norwegian State Petroleum Fund (established in 1990, although it did not receive any inflows until 1995). In the past few years, there has been quite a scramble among natural resource producers to set up NRFs. Some of these are new producers such as Sao Tome and Principe, which passed legislation establishing a permanent fund in December of 2004,<sup>5</sup> while others are established producers, many of which have experienced political transitions in the recent past (e.g., Azerbaijan established its State Oil Fund in 1999, Kazakhstan set up its National Fund in 2001,<sup>6</sup> and East Timor has set up a Petroleum Fund after the Norwegian model).<sup>7</sup>

The stated purpose of these NRFs is to facilitate the accumulation of large, volatile, and temporary revenues when times are good; stabilize

public spending; and finance public spending when natural resource revenues are no longer flowing in. The reality, however, is more worrisome. Studies show that it is difficult to detect a consistent improvement of fiscal policy in countries with NRFs relative to those without them. Fasano (2000) examined the NRFs of Norway, Chile, Alaska, Venezuela, Kuwait, and Oman, and found that the outcome is “mixed,” which reflects in part “the challenges in *adhering* to the operational rules” (emphasis added) and the “overall fiscal discipline in the country.” Davis et al. (2003) carried out an econometric analysis of the effect of NRFs on the link between changes in public expenditures and variations in revenue. They found that while some countries with NRFs exhibit a lesser sensitivity of government expenditure to natural resource revenues than countries without NRFs, that advantage was already present before the countries set up their respective NRFs. There is therefore no evidence that adopting NRFs in these countries contributed to the soundness of their fiscal policies.

The experience of African states with the primary commodity marketing boards of the 1970s and 1980s also provides grounds for caution. These institutions were similar in principle to natural resource funds in many ways. The marketing boards, established with the purpose of smoothing income fluctuations, building up savings and facilitating local investment, became a tool for governments to generate private gains at a cost to economic producers (Bates 1981). The failure of these boards lay in part in the fact that their design ignored the incentives facing the political leaders who controlled them.

We see that in practice, NRFs and similar institutions rarely make it any easier to accumulate large amounts of money in the orderly fashion the normative economic model calls for, reflecting the fact that the incentives surrounding the choices of politicians do not conform to this idealized model. For fiscal policy to be correct, it is not sufficient to get the economics right. One must also get the political economy right, and as much as possible align the political economy incentives of decision makers with what is good policy for the country.

#### **POLITICAL ECONOMY INCENTIVES AGAINST ACCUMULATION**

In this section we analyze the political economy incentives that may face politicians in countries with accumulated revenues—whether or not these

revenues are formally a “fund.” To set up institutional solutions to make it more likely that a beneficial spending path will be followed, it is necessary to understand the incentives that make it unlikely in the first place. Why do decision makers tend to be impatient—why are they so likely to spend too much of the money that is available instead of saving it for harder times and for future generations?

Our main analysis concentrates on the nature of *interest-group politics with power rivalry*. Most of politics involves a struggle between competing interests, and we show in what follows that the competition for power among different groups can create perverse incentives to overspend in early time periods (with less left for later), even when there exists a more stable time path of spending that all groups would prefer. After this main case, we extend the basic analysis to discuss how overspending can be affected by the following possibilities.

- Politicians may gain political support through higher public expenditures.
- Conversely, an informed citizenry might punish politicians who imprudently overspend.
- Increased public spending may be privately valuable for the politician (independently of any political support it buys him).
- Accumulated revenues may provide an incentive to undermine the “rules of the game” embodied in the country’s governing institutions.

Before turning to these specific possibilities, we now describe our basic model of power rivalry.

#### INTEREST-GROUP POLITICS WITH POWER RIVALRY

Political competition often consists of the contest between representatives of different interest groups to control the public purse and use it to the benefit of their own group. The nature of the different groups varies across different countries. The dividing lines can be based on class, ideology, ethnicity, language, religion, or other traits. The severity of the divisions, and the extent to which political competition follows interest-group lines, are also different in every country.

The degree to which politicians compete for the opportunity to favor their own group at the expense of others will affect the fiscal policies of the state. Dixit et al. (2000) show how the division of the budget in an electoral period depends on the nature of the political competition, in particular the likelihood of a change in government in the next period.

When the sitting government decides how much of the budget to allocate to its own group, it must take into account how the opposition will behave as a result if they take power next. A similar dynamic can affect the *total* amount of spending of natural resource-generated wealth. A government may ideally want to spread spending evenly across all periods, but the possibility that another group takes power in the next period, and one's own group loses out as a result, creates an incentive to spend too much now. The incumbent government can choose its own preferred spending patterns with today's expenditures, whereas if another group takes power tomorrow, it will allocate tomorrow's expenditure according to *its* preference. This makes it preferable for an incumbent government to shift expenditure from the future to today.

We consider the following setting<sup>8</sup>: Suppose a country has an amount of accumulated past natural resource revenues—that is, it has a “fund,” at least in the notional sense, of past earnings. We assume that there is no other income or wealth. To keep it simple, we assume that the population is divided into two equally sized groups (*a* and *b*). The politicians must select some share of the total “fund” to allocate to projects benefiting each of the two groups in each of two periods (1 and 2). Hence they must choose both the division of *aggregate* expenditures in the two periods and the allocation of resources to projects benefiting each of the two groups within each period.

Suppose now there are two potential policy makers that we also call *a* and *b*, with divergent preferences over the welfare of two different constituencies. We assume that each of them cares about both groups, but they care relatively more about their own group than about the other.<sup>9</sup> In addition, we impose some technical constraints on the preferences of the policy makers. In particular, we assume that benefits delivered today are considered better than the same benefits delivered tomorrow (that is, policy makers are impatient), that there are *positive but diminishing marginal benefits* from spending on each group (i.e., each additional dollar spent on the same group adds progressively less benefit), and that the elasticity of substitution of benefits across groups is constant.

Now, suppose policy maker *a* is in power in period 1 (so she is the “incumbent,” and policy maker *b* is the “challenger”). Consider first the situation where she knows for certain that she will still be in government in period 2. In this case, we can show that her preferred choice is very simple and can be thought of as consisting of two components: a decision regarding how much to spend in each period, and a decision about how to divide a given period's expenditure across the two groups.



Under the assumptions of the model, we can show that for the second decision, she simply allocates a fixed share of whatever amount of money is available for spending in that period to her own group, and the remaining fraction to group *b*. The share is independent of the *total* amount spent in each period. The same is true for the challenger, although obviously the shares will be different from those of the incumbent.

#### Finding 1

Once the aggregate amount of spending for a period is set, the policy maker gives a fixed share to each group. The policy maker's own group gets the largest share, and the share increases the more biased the policy maker is. Moreover, the more slowly diminishing marginal benefit sets in, the more unequal is the allocation. This suggests that if marginal utility diminishes more slowly in poorer societies, then poverty will be associated with deeper disagreements.

Since we know how the policy makers want to “divide the pie” between groups in each period, we need now only work out how they would choose to divide the total fund across the two periods. Policy maker *a*'s choice can be simplified to choosing the amount to be spent in the first period and therefore implicitly the amount for the second period (whatever is left unspent from period 1). We consider first a situation where she *knows* that she will be in power next period as well, and show that she will smooth aggregate spending across periods, with any change from period 1 to period 2 caused by the impatience inherent in the preferences—the more patient she is, the closer the division is to a 50:50 split across the two periods.<sup>10</sup> (*Within* each period the division between the two groups can be far from a 50:50 split; that will depend on how biased the incumbent is toward her own group.)

This choice has several appealing properties:

#### Finding 2

When the incumbent knows she will be in power in both periods, she chooses a time path of aggregate spending that is *efficient* in the sense that there is no allocation that can allow any one group to do better without making the other group worse off. Furthermore, it is *optimal* for the incumbent in the sense that there is no other allocation across groups and over time that would make *her* better off, even at the cost of making the other policy maker worse off.

One implication of this is that the policy is *time consistent*—it does not matter whether the incumbent makes her decisions regarding both periods right away, or decides on the allocations one period at a time. The sequentially decided policy is the same she would choose if she could commit to the entire time path of spending allocations (i.e., for both periods) at the beginning of period 1. This is not true for all types of economic policy choices,<sup>11</sup> but it is true here: with correct anticipation of her own choices in the second period, the staggering of the decision-making process has no impact on the policy maker's choices.

Now consider the more realistic situation in which the policy maker is uncertain over the choices that will be made in future periods. There is some probability  $q$  that she will be turned out of office and be replaced by policy maker  $b$ . In this case, she will choose a different allocation of expenditure across time. Her best choice, given that she expects  $b$  to favor his group, now depends not just on her impatience, but also on the size of  $q$ —the probability that she will be turned out of office—and the degree to which her priorities differ from those of a potential rival.

From this simple result, we can draw certain immediate lessons:

#### Finding 3

The less stable the government—in the sense that there is a higher likelihood of an imminent change in government—the stronger the incentive for spending a lot today. Period 1 spending is higher the larger is  $q$ , which shows that as policy maker  $a$ 's power becomes more precarious, she is tempted to spend more.

#### Finding 4

The deeper is the division among the groups—the more pronounced is the tendency of politicians to favor only their own group at the expense of others—the greater will be the incentive to spend too much while one is in power.

The model also shows that these last two effects—the instability effect and the conflict effect—reinforce each other. Instability has a more adverse effect in more divided societies.

Disagreement and instability, then, cause overspending and inefficient fiscal policy. This should *not* be interpreted as a claim that dictatorships are more efficient than democracies; rather, what matters is the *horizon* of regimes. Governments or rulers who expect to be in power for a long time

have an incentive (out of their self-interest) to smooth spending over time. This incentive disappears when power is precarious, for example, because of frequent coups or revolutions (as is in fact empirically more likely in nondemocratic systems). As we shall see below, electoral politics can modify this finding in several ways. Moreover, if in democracies, government changes do not produce as large shifts in spending allocations, the incentive to overspend is weaker in them.<sup>12</sup>

Since distributive conflicts can lead to overspending of accumulated funds, we should not be surprised that the resulting front loading of spending has distributive effects:

#### Finding 5

The distortion has distributive implications. It redistributes to the incumbent's group (*a*) from the other group (*b*), thereby partly compensating for the lower welfare the incumbent has due to the probability of losing office. Given that the incumbent *a* prioritizes her own group within each period, *b* would prefer aggregate expenditure to be shifted toward period 2, when policy maker *b* has some likelihood of deciding the allocation, and away from period 1, when it is certain policy maker *a* decides. The challenger *b*, then, would prefer a *reduction* in first-period expenditure relative to the baseline efficient time path, rather than an increase. Thus, as policy maker *a* protects herself against the eventuality that *b* gains power, she makes *b* worse off. Only if  $q = 0$  and there is no chance that *b* will gain office is *b*'s ideal intertemporal expenditure the same as *a*'s.

An important finding of the model is that the loss that the incumbent inflicts on the challenger by shifting expenditure to period 1 is *greater* than her own gain. As a consequence:

#### Finding 6

There exist of expenditure intertemporal profiles that are not chosen but that would make *all* groups better off.<sup>13</sup>

The challenge for institutional designers in countries where this is a big problem is to find ways to solve this problem and realize the efficiency gain that could in principle benefit all parts of society. Two types of improvements are possible. One involves *risk sharing*. Since the policy makers in this model are risk averse, they dislike the uncertainty of what the spending pattern across groups will be in period 2. Both will therefore, *ex ante*, prefer outcomes that minimize the variation in the expected second

period expenditure.<sup>14</sup> This could be achieved in all cases by both parties committing *ex ante*—were this possible—to implementing the same compromise allocation in period 2, the value of which would exceed the expected, risk-adjusted, value of the policies that may be implemented by the uncertain winner of the power contest. Such risk sharing can be beneficial even without any change in the *intertemporal* allocation of aggregate resources and is a feature that has been studied elsewhere in settings in which total per period allocations are fixed (see, e.g., Alesina 1988; Dixit et al. 2000). Of course, the big obstacle to such joint commitments is the difficulty of making a credible commitment that one will not exploit an advantageous position once it has been determined who is in power.

The second type of improvement involves intertemporal smoothing of aggregate expenditure. From the point of view of our examination of NRFs, these concerns are especially interesting. Inefficiency arises in part because the first period government increases the expenditure beyond her own optimum; this rise in expenditure implies a loss for her relative to the situation in which her return to office is guaranteed. But as noted earlier, this loss for the first government does not imply a gain to the second period government since the increase is in the direction of distributive allocations favored by the incumbent only. To see how an improvement in this case is possible, imagine a situation in which player *b* could commit, in the event that he takes office in the second period, to allocate shares that are more favorable to *a* relative to what he would normally like to allocate. With such a commitment, *a* would find it advantageous to shift more spending from period 1 to period 2, making herself better off and more than compensating *b* for his reduced share, should he gain office. Again, the downside of such a solution is the commitment problem—a promise by player *b* not to take full advantage of being in power in period 2 is not necessarily credible.<sup>15</sup>

Here we reach the heart of the matter. Inefficient overspending occurs because of incentives created by diverging interests and competition for power to advance those interests. The inefficiency can be overcome if policy makers can commit not to take full advantage of their power when they are in government. If such commitments could be credibly made, incumbents would have fewer incentives to spend everything before losing power. Everybody would benefit from the resulting change: The challenger would benefit from having the prospect of more money to spend once he gains power, and the incumbent from the more efficient time path of spending on her group, as well as a more favorable treatment than her group would otherwise receive at the hands of *b* should he gain power.

This point is really a special case of the more general idea that efficiency can be improved by the predictability made possible by the rule of law and checks and balances in government.

Can a natural resource fund provide the kind of commitment device needed here? An NRF could place a cap on expenditures in each period, which, if implemented, could return the society to an efficient expenditure profile. This profile, however, *would not necessarily make both players better off than in the situation which would otherwise obtain* (that is, the fund may not constitute a “Pareto improvement” on what would prevail in its absence). Imposing a limit on how much *a* is allowed to spend in the first period will reduce *her* expected welfare, and she therefore has a strong incentive to resist compliance with such a rule. As we saw earlier, she needs to expect a compensation in period 2 (in the form of a less biased allocation by policy maker *b* should he gain power) for what she gives up by shifting expenditure to a time during which it is uncertain that she would control how it is spent. An NRF design that did not take account of this would run a serious risk of being ignored, violated, or changed, with the possible further harmful effect of reducing the respect for policy commitments or the force of law.

A Pareto-superior time path would require some form of implicit contract compliance *across* governments, in which present governments that cap present expenditure are compensated by actions of future governments. The implication is that expenditure stability might require not simply caps on *how much* can be spent, but also guarantees regarding *on what* the saved money is to be spent. Also implicit in our analysis is the fact that the problem is likely to be worse if a sitting government faces fewer and lesser constraints on what it can do. If the opposition, say, can prevent the worst excesses of the sitting government, the latter would be forced to take into account the interests of the former. Further, if the incumbent knows that she can prevent a new government’s excesses in the case she loses power, she will be more willing to delay spending.

#### SPENDING AND POLITICAL SUPPORT

In the analysis so far, we have ignored one very important fact: The government’s spending decisions can affect the incumbent’s likelihood of remaining in power. As the incumbent foresees these consequences, she will modify her behavior. There are myriad mechanisms through which such effects may be mediated—some mechanisms will make matters worse, others might alleviate the problem. We first survey some of the

former type: mechanisms that are likely to exacerbate the incentives for overspending.

Why may a politician be rewarded for a policy that deviates from the one that is best for the population? One reason is that citizens themselves may be myopic, and therefore ignore the long-term consequences of a policy that is satisfying in the short term. There is strong evidence from social psychology that such impatience (or “hyperbolic preferences”) is a common trait (Ainslie and Haslam 1992). Another situation in which politicians’ fortunes might be better served by spending more is when a political system gives disproportionate influence to the support of a small part of the population (see chapter 2). In such circumstances, that small part of the population might expect always to be favored by the spending policies of the government without having to pay the burden of future spending cuts, which may be more evenly spread across the population. Put differently, the future negative consequences of profligate spending today may be insufficiently internalized by the politically most powerful group. A third and important mechanism by which spending affects support is that larger budgets allow a government to employ more civil servants, which may lead directly to a rise in political support. We refer to Robinson et al. (2005) for an analysis of the effect of natural resource booms on the incentives for bloating the public sector with inefficient patronage jobs. Their model produces a general pattern similar to that described here: The ability to strengthen one’s political support by expanding the public sector leads to an inefficiently high level of extraction of the depletable natural resources. The more the power prospects can be manipulated in this way, of course, the higher the extraction/depletion rate.

Our simple model also sheds light on these cases. The findings discussed in the preceding text were generated for cases where the probability of a power change is independent of policy choices. If the likelihood of remaining in power is instead *improved* by expansionary policies, as suggested by the literature on political business cycles and public debt,<sup>16</sup> then the problem is exacerbated. Suppose that instead of a fixed  $q$ , the probability of a power change depends on the amount of aggregate spending in period 1:

#### Finding 7

If the probability that a government is removed decreases when incumbents spend more, then the distortion effects are even greater than in the baseline case. Moreover, the more sensitive to first-period spending is the

probability that power will change, the more inefficiently high is first-period spending. Conversely, if the probability of a power change depends positively on spending in the first period, then the level of aggregate spending in period 1 is lower than it would be with a fixed probability, and consequently closer to the socially efficient level.

As the second part of the finding says, the need for political support can also encourage *more prudent* fiscal policy. Overspending, after all, can considerably reduce the welfare of the population, relative to the policies prescribed by the economic analyses we discussed in the previous section. In a well-functioning democracy, informed voters could impose discipline on the government by throwing the incumbent out of office if she overspends by too much in the first period. This type of mechanism will be affected by how well the citizenry can observe the fiscal policies of the government, in particular the magnitude of natural resource revenues and the rate at which they are spent. Even in a country where the citizens are both motivated and have the ability to discipline the government, this cannot happen easily if they do not know what the government is doing.

#### TRANSPARENCY

We now proceed to identify the effect of transparency on the political incentives we have discussed. To do so, we draw on the analysis of government choices and political support found in Ferejohn (1986). This analysis assumes that the public observes the actions of politicians with some error. It may be, for example, that the public observes aggregate government expenditure but does not know the precise origin of such funds. In this extension of our simple model, citizens are, on average, correct about how much is left for spending in period 2, but they do not all get it right. The less transparency there is, the more the estimates of individual citizens vary. Those who think too little is left for period 2 punish the incumbent by supporting the challenger. Under such circumstances, we obtain the following result:

#### Finding 8

Greater levels of transparency result in more efficient monitoring and disciplining of the government by civilians and result in more efficient expenditure profiles.

We complete this section by considering two other mechanisms that may generate perverse incentives.

## PRIVATE GAIN FROM PUBLIC SPENDING

Public spending may give politicians benefits other than stronger political support. There may, for example, be private benefits to spending more. Larger budgets—and consequently higher public employment—may give the members of the government social status and prestige, and greater opportunity for patronage. This could be seen as a personal investment for a policy maker, since it could result in a return of favors once he or she is out of office. This would create a separate incentive for spending even when there is little political competition and the officeholder is certain that his or her successor will be from the same party or represent the same interest group.

This effect is likely to be especially important when the end of the politician's term in office is imminent. More generally, the shorter is the average tenure of office, the stronger will be the incentive to boost the rate of public spending. The incentive is also likely to be stronger in societies where patronage positions and favors are important parts of the social fabric, and where meritocracy is weak, so that a politician's future welfare more strongly depends on the friendships and relationships he has established while in office.

## INCENTIVES TO CHANGE THE RULES OF THE GAME

In institutionally weak environments, the presence of large resource rents can also provide a "prize value" to state capture (Fearon and Laitin 2003). In cases in which violence or extraconstitutional means can be used to overturn a sitting government, the holding of valuable assets by weak political actors can be an especially risky enterprise. In terms of our model in the preceding text, this effect can be captured (as we did for the case of endogenous reelection probabilities) simply by treating the probability of termination of office (now by constitutional *or* extraconstitutional means) at the end of the first period as an increasing function of the remaining assets.<sup>17</sup> As before, this would lead to a rise in first-period expenditure. Note, however, that this should occur only if coup-makers can expect to have easy access to government revenues upon overthrowing the sitting government.

## SUMMARY OF RESULTS

Our simple model of policy choices provides insight into the factors affecting government decision in the presence of accumulated revenues. We find



that the tendency to spend too much too quickly, far from being irrational, follows a simple logic. The incentives to overspend produce outcomes that have distributional as well as efficiency implications. These incentives cannot be changed simply by placing caps on expenditure. Instead, they require some form of coordination between governments at different time periods regarding not simply *how much* is spent, but *how* it is spent.

The adverse effects that we identify are likely to be more pronounced in some places than they are in others. The incentives are greatest in societies in which there are deep social divisions and in which political instability is high. They will be exacerbated in contexts in which current spending increases the chances of retaining power; a feature that is likely to prevail when (1) a large part of the population lives in poverty and has very high discount rates; (2) due to horizontal or vertical income inequality (see chapter 9), small but politically pivotal groups can affect policy choices disproportionately; (3) governments have greater freedom to use expenditure decisions to fund patronage networks that increase their support base; or finally (4) due to low education levels or a lack of transparency about the implications of government choices, the population is less able to exert control over policy makers.

We developed these results within a simple model of policy choice over two periods. In a more realistic environment, the decision-making processes described in the preceding text are repeated many times. In such a case, the effects we identify can still be observed, but other outcomes are also possible. In particular, it is possible that if players are sufficiently patient, a form of *tacit coordination* across policy makers can emerge, in which each policy maker voluntarily moderates expenditure from fear of retaliatory action by future policy makers should she overspend. Such tacit coordination does not *require* the existence of formal institutions to ensure compliance. It does, however, depend on some of the same conditions that we argued can help ameliorate the problem even in the two-period setting. In particular, it depends on a minimal degree of transparency that allows future governments to observe the actions of past governments and condition their behavior on these actions.

#### **POLITICAL ECONOMY CHALLENGES TO PRUDENT POLICY: EMPIRICAL RESULTS**

A key result in our analysis above is that a high degree of discretion by a single political constituency creates incentives to use up windfall revenues

as soon as they come in instead of accumulating them. Here we present some empirical results which suggest that this relationship holds in practice as well as in theory. As discussed in the preceding text, the optimal economic policies should not let year-to-year government expenditures vary much in response to oil revenue fluctuation. To examine whether natural resource-rich countries follow such policies, we consider a simple econometric model of government consumption in a sample of oil producing countries. In this model we relate change in government consumption (as recorded in the World Bank's World Development Indicators 2002) to an indicator of the value of receipts earned annually from a country's oil industry, as recorded by published sources.<sup>18</sup> The results of the model are presented in table 8.1. The first column in the table shows that on average, there is no discernible pass-through of year-to-year oil revenue changes to aggregate government consumption. The coefficient on year-to-year changes in oil revenues is statistically indistinguishable from zero.

The picture changes, however, when we differentiate between countries with weak and strong divisions of power in the governance systems. The variable used, CHECKS, is drawn from the Database of Political Institutions (Beck et al. 2000) and measures the degree to which political

**Table 8.1** Empirical Results

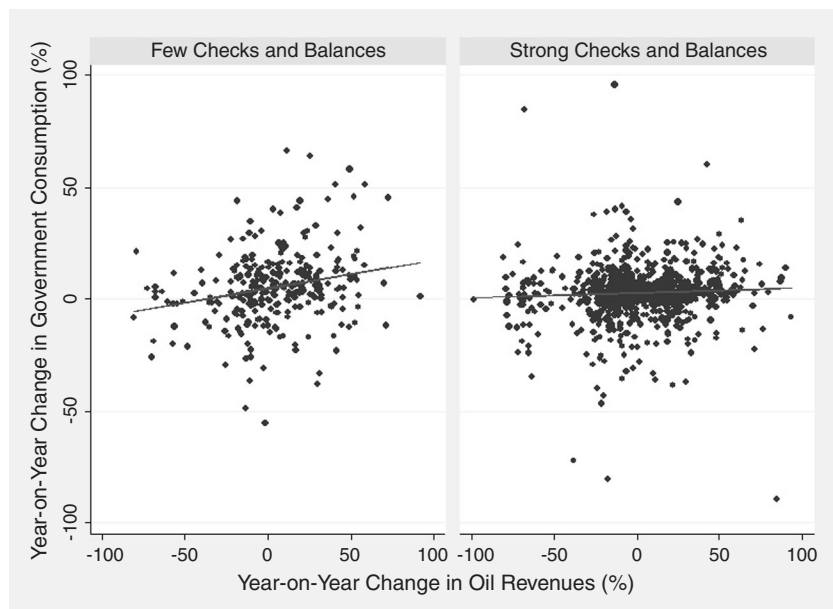
|   | Year-to-Year Change<br>in Government Consumption | Year-to-Year Change in<br>Government Consumption |
|---|--|--|
| Year-to-year change<br>in GDP, %                    | 0.663<br>(0.000)***                              | 0.644<br>(0.000)***                              |
| Year-to-year change<br>in oil revenues<br>(dOIL), % | 0.009<br>(0.411)                                 | 0.092<br>(0.003)***                              |
| CHECKS × dOIL                                       |  | -0.090<br>(0.003)***                             |
| Checks and balances<br>(CHECKS)                     |  | 0.001<br>(0.957)                                 |
| Constant  | 0.013<br>(0.631)                                 | -0.031<br>(0.199)                                |
| Observations  | 2118   | 1284   |
| Number of countries                                 | 94   | 91   |
| R-squared   | 0.12   | 0.14   |

Fixed effects regression (country fixed effects). Yearly change variables measured with one-year lag. Controls not reported: Year dummies. *p*-values in parentheses.

\*significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%

power in a country is subject to checks and balances.<sup>19</sup> The data show a strong relationship between the strength of the institutional environment and the effect of oil revenues on spending. The importance of the institutional environment for how oil revenues are managed is vividly illustrated by a simple scatterplot of the change in government consumption against the change in oil sales, drawn separately for countries with weak and strong checks and balances (figure 8.1).

The graphs bring out the essential finding of the second regression. In countries with strong checks and balances, government consumption bears little relationship to oil sales volatility. However, there is a strong effect in countries with worse governing systems. The elasticity of the change in government consumption with respect to the change in oil sales is 0.092 in countries with few checks and balances, meaning that for a doubling of oil sales, government consumption in such countries increases on average by 9.2 percent. This implies a high rate of pass-through of oil revenue changes. Suppose that 20 percent of government consumption is financed by oil and oil sales double. Then we have that oil earnings in-



**Figure 8.1** Sensitivity of Government Expenditure to Annual Changes in Oil Revenues in Countries with Many and Few Checks and Balances.

Source: Authors' calculations.

crease by 20 percent of baseline government consumption, and expenditure increases by 9.2 percent of baseline government consumption, implying that 46 percent (that is, 9.2 percent/20 percent) of the additional money is consumed within a year.<sup>20</sup>

### POLICY IMPLICATIONS

Our analysis makes plain that policy makers have strong *political* incentives not to follow what economists might describe as the economically best policy. We should therefore not be very surprised to find that economic logic is rarely followed in natural resource-rich countries. But our analysis also shows that it can be in the interest of *all* parties, including incumbents, to find institutional arrangements that help discipline expenditure. The model described shows how overspending can result from the fact that individual policy makers cannot commit to undertake a given set of actions in the future. The practical issue is, then, how to overcome this problem. In particular, what kind of institutional reforms might improve the ability of policy makers to make mutually advantageous, credible commitments?

It is in light of this question that the decision whether or not to establish an NRF—and what kind of fund to design—should be resolved. Since an NRF is not necessary for strictly economic reasons, the rationale for it has to be as a vehicle for institutional solutions to the political economy problem. If that is impossible, an NRF is at best useless—and if designed without a view to its effect on political incentives, may even make such incentives worse—and should be eschewed. Designers of prospective NRFs, therefore, must determine whether an NRF can realign local incentives. As we have emphasized, this is different from answering the basic economic question of what the optimal time path of natural resource-financed expenditure would be.<sup>21</sup> Instead, the analysis we recommend would focus on what the agents entrusted with carrying out the expenditure policy are likely to do, and how different NRF designs may change their behavior. Such analysis could conceivably prefer an NRF that encouraged a less-than-perfect expenditure path, but a path that policy makers would in fact implement, to one which called for policy makers to implement the optimal policy but gave them no incentive to comply.

We emphasize that the best design will be different in different countries. It has to take account of the local political economy, which is best understood by experienced practitioners with intimate knowledge of local

political conditions. What we can do at a general level is to list types of institutional mechanisms that could be implemented through an NRF, and that may work in some local settings, if not in all. What we aim to provide in this section, then, is an inventory of potential institutional “fixes,” which designers of NRFs can use as a roadmap to identify solutions that are most likely to work in their local political setting.

The ways in which NRFs could embody institutional solutions to the incentive problem fall, very roughly, into three categories:

1. The NRF can be set up with *rules* that govern the *magnitude* and *composition* of spending from it. The use of rules rather than discretionary decisions can provide one way of improving the regularity of policy across governments and help solve the commitment problem identified above.

2. An NRF can impose a *separation* or *sharing* of decision-making authority between different political constituencies. For example, the preceding discussion suggests that one way to remedy the commitment problem is to *separate the authority to decide how much is to be spent from the authority to decide on what it is spent*.

3. An NRF can have an *informational* role. We have shown that under certain conditions, transparency increases the ability of the citizenry to hold the government accountable. In addition, it is well known from the economics of information that when information is scarce and asymmetric, efficient outcomes are more difficult to sustain. An NRF could alleviate this problem by facilitating the flow of information within the government system and between it and the population or the international public.

We now survey a range of more specific institutional mechanisms an NRF could use to implement these three principles. Chapter 11 discusses some of these mechanisms in further detail, in particular with a view to the legal issues they raise.

#### RULES

One possible solution to the problem of overspending is to remove the government’s discretion over how natural resource wealth is spent. Most NRFs are set up with conditions on how and when money can be withdrawn from them, with the intention of making the money in the NRF less easy to mismanage than revenues that are at the government’s free

disposal in the normal budget. We discuss three types of rules institutional designers will wish to consider.

**Quantitative constraints: Rules governing *how much* can be spent.**

An NRF can limit the government's discretion over how much of natural resource wealth is spent by a rule or formula indicating the maximum expenditure allowed (or conceivably, the exact amount to be spent). In practical terms, the rules can express how much is available for spending either as a function of that year's revenues, or as a function of total wealth, or some combination. Often rules are expressed as a function of the commodity's price and its deviation from some benchmark level. Other times, rules limit spending to a proportion (typically the expected investment return) of the money already accumulated in the NRF, that is, a function of financial wealth rather than total natural resource wealth (i.e., excluding the resources not yet extracted).<sup>22</sup>

Regardless of how the ceiling on yearly aggregate spending is specified, the legal status of the rule can vary considerably. In fact, "rules" are situated on a continuum between discretion and rigid formulas. On one end of the spectrum there are "rules" that have no legal force and only reflect the government's intended policies or policy "guidelines" or "commitments" (an example is the Norwegian State Petroleum Fund, and to a lesser degree the Petroleum Fund of East Timor). At the other end are formulas for expenditure ceilings enshrined in law (such as in Sao Tome and Principe), or with constitutional force (as in Alaska). Table 8.2 lists some countries with NRFs and describes the legal force of the rules governing in- and outflows from their funds, situating the "rules" from the almost discretionary to the constitutionally mandatory.

Depending on how mandatory a rule really is, restricting policy makers' discretion comes at a cost of flexibility. Governments can respond less easily to crisis situations or unforeseen changes that change the optimal policy, but it can also give current governments confidence that the results of prudent expenditure in one period will not be squandered through lavish expenditures in future periods. Nevertheless, quantitative caps are probably not a sufficient solution to the basic commitment problem that affects policy choices in resource-rich countries. The core problem, as our analysis suggests, is that policy makers will have an incentive to overturn or ignore these caps, because the incentives to spend too much too early derive in part from concerns about how, rather than simply how much, money will be spent.

**Table 8.2** Rules Governing Inflows and Outflows from NRFs in Selected Countries

| More<br>Discretion | Inflows   | Quantitative<br>Constraints  | Qualitative<br>Constraints   |
|--------------------|---|--|--|
| ↑                  | Norway<br>All oil revenues enter the fund.                    | Parliament is unconstrained, but politicians have committed to an informal “handling rule” not to spend more than 4% of the balance of the fund per annum.   | Outflows cover balance of government budget, decided by Parliament.  |
|                    | East Timor<br>All oil revenues enter the fund.                | Parliament is unconstrained, but is supposed to stay within the highest amount that can be sustained in perpetuity (the permanent income from the oil wealth). The formula is given by law. Special reporting and justification procedures must be followed if amount exceeds the guideline. | Outflows cover balance of government budget, decided by Parliament.  |
|                    | Sao Tome and Principe<br>All oil revenues enter the fund.     | Outflows cannot legally exceed the highest amount that can be sustained in perpetuity (except in the transition period before regular oil production starts). The formula is specified in the law on oil revenue management.   | Outflows enter the government budget directly, but must be used for development purposes.  |
| ↓                  | Alaska<br>A fixed proportion of oil revenues enters the fund. | A formula governs the amount of money that can be paid out from the fund. The rules are enshrined in state law and the state constitution.   | Outflows can only go to citizens in the form of “permanent fund dividends.” The rules are enshrined in state law and the state constitution. |
| Less<br>Discretion |   |  |  |

### Qualitative constraints: Prededicated expenditures

In addition to codified rules for the amount of *aggregate* spending, an NRF could have rules for *how* the money is to be spent. Ecuador, for example, allocates excess oil revenues (above a budgeted oil price) to various funds with specific uses determined by law. For some of these, the decision of the aggregate amount to spend remains at the president's discretion, but the allocation to various uses must comply with the law.<sup>23</sup> Chad's oil revenue management law provides for fixed percentage allocations of oil revenues to special "priority sectors" such as health and education (we refer here to the law in vigor before the amendments announced in January 2006). Alaska state law specifies that 50 percent of the investment return on the principal of the Alaska Permanent Fund be distributed to all the state's residents on a per capita basis (the remainder has to be used to inflation-proof the principal before it can be spent on other uses). In other countries, fund rules state the general purposes for which the money should be spent, but in such a broad way that almost everything would seem to be allowed.<sup>24</sup> Again, the rules of existing NRFs vary widely in how legally binding they are (see table 8.2).

Proposals to impose such qualitative rules are commonly met with a concern that prededicated expenditures may occasion parallel budgets, which lead both to a loss in allocative efficiency and to a decline in transparency. As a practical matter, steps can and should be taken to ensure that this does not occur, by requiring that prededicated expenditures are entered into the general budget, or ideally, that qualitative constraints are referenced to the entire budget and not simply to the portions financed by an NRF. We return to this point when we discuss transparency below.

### Rules governing inflows to the NRF

Many NRFs are set up with specific rules as to what should go *into* the NRF. This is not always necessary—money can be placed in the NRF by a discretionary act of the incumbent authorities when revenues are high. Discretion, however, allows governments to circumvent the rules the NRF imposes on *spending* by simply directing money straight to the budget without passing through the NRF. In the case of Chad, for example, signatory bonuses were not required to enter the fund with the result that initial expenditures of oil revenues in Chad were used for military rather than developmental purposes. Several countries accordingly channel *all* their natural resource revenues, including signatory bonuses, into their NRFs; others a fixed proportion (table 8.2). In some countries, NRFs receive some



proportion of “excess” natural resource revenues, where the excess is defined relative to some budgeted price for the commodity in question (this is the case for Ecuador’s oil revenues and Chile’s copper revenues, for instance).

#### Benefits and drawbacks of rules

How likely are rules to improve the political economy challenges we have discussed? They may do so if breaking the rule imposes costs on the policy maker, or if policy makers recognize that when they follow these rules, other policy makers may also be more likely to follow them.<sup>25</sup> The nature, magnitude, and probability of such costs will however vary both with the legal status of the rule (abandoning a policy commitment is different from breaking the law) and with the local political and institutional context. Even the authority of the law is a real problem in many countries, and a law that the government has an incentive not to follow may not be complied with.<sup>26</sup>

This points to a deeper problem: Even if a rule stating that the government should not overspend changes the political calculation (because it is costly to break), it does not remove the original reason why the government wants to overspend—it merely counterbalances it. The original incentives may therefore prevail even in the presence of a legally enshrined rule. Just as we were earlier asking what incentives a policy maker had to deviate from the economically optimal policy, we may now ask what incentives a policy maker has to violate the rule (even one with legal force) that tells her to adopt that policy. Rules that implement spending paths that are not Pareto improvements on the *status quo ante* may be brittle, in the sense that they may be flouted at the first spike in commodity prices. Worse, they may also, by creating or reinforcing a precedent of rule-breaking, weaken the force of law overall. Designers of NRFs, therefore, must strike a compromise between creating incentives for the right policy *and* incentives to comply with the rules themselves.

Creating the incentives to comply with the rules is more than a legal issue or issue of institutional design. It also touches on aspects of investment policy, economic planning, and political communication. In some instances, for example, decisions regarding how monies in the fund are to be invested can affect the costs and benefits associated with ignoring, altering, or complying with rules. For example, fixed-term investments with a long term to maturity can in principle help enforce quantitative restrictions by reducing the liquidity of assets, although the impact of such investment policies on the incentives to alter or ignore the law will naturally depend

on the country's access to debt financing. In many cases, we may expect that the political costs associated with ignoring rules, such as rules allocating expenditures to key development areas or to particular regions, to be greater the more embedded the rules are in the longer term development planning within the country and the greater is the information available to the beneficiaries of those rules regarding the targeted funding.

#### SEPARATION OF POWERS

A reliance on rules, then, is vulnerable to the possibility that policy makers have incentives to break them. In polities where the costs of breaking rules are low, therefore, other mechanisms are needed to change policy makers' incentives. An alternative to (or reinforcement of) attempts to reduce discretion through rules is to change the incentives of decision makers by *spreading* or *dividing* decision-making authority. If several political actors (including potentially nongovernment actors) participate in spending decisions, it can become necessary for each party to take the interests of the others into account in each period, thus altering the types of policies that emerge. An NRF whose institutional structure spreads decision-making authority across several constituencies with partly overlapping and partly divergent interests may encourage compromise solutions that are to the benefit of all and reduce the intertemporal disagreements that can give rise to inefficient expenditure.

The degree to which power is shared can range from granting an equal standing to several constituencies in the decision-making process, through giving some constituencies veto rights over the decisions made by the executive, to merely affording other constituencies a monitoring and supervisory role. We now survey some concrete possibilities and examples.

#### Political power-sharing

The NRF can be set up so that it vests the authority to make (or approve) spending decisions across multiple political constituencies. In Norway, for example, transfers from the State Petroleum fund must be approved by the parliament, even though the fund itself is managed by the Bank of Norway and therefore ultimately by the Ministry of Finance. Since the political opposition is typically strong in Norway, and the electoral system often produces minority governments, this constitutes a real (if not very deep) division of decision-making authority. Nevertheless, this particular mechanism is unlikely to work as well in countries where the opposition

may be too small or too weak to influence parliamentary decisions. In such countries, one can envisage other forms that the division of power could take, such as

- requiring the assent of a supermajority of the legislature for spending decisions.
- requiring the main opposition party, or some share of the opposition, to sign off on spending decisions every year before the NRF can disburse.<sup>27</sup>
- dividing the decisions about *how much* to spend and *on what* to spend across different levels of government. For example, the national executive could decide on the aggregate amount, while the allocation to different projects could be decided by local governments.<sup>28</sup> Alternatively, in bicameral legislatures, the two decisions can be vested in separate chambers.

#### Independence

So far we have considered dividing discretionary decision authority between different political constituencies (or removing discretion altogether by rules, if they can be made to work). Another “separation” of powers would be to *shift* either the discretionary decision making power or at least the power to *approve* or *supervise* decision making to a constituency that does not have incentives for overspending. An NRF could do this by vesting the authority to make spending decisions in independent or technical bodies (if such exist) or civil society representatives. Examples of such mechanisms for institutional independence include the following:

- Giving the NRF itself legal personality and institutional independence. Alaska’s Permanent Fund, for example, is a separate public corporation, although its trustees are appointed by the governor.
- Giving courts the authority to review compliance with the spending rules/funds.
- Creating a new technical body not beholden to the executive, and giving this the authority to determine a spending cap. This solution has been chosen in Sao Tome and Principe, which is in the process of creating a “Petroleum Oversight Committee.” Alternatively, the Central Bank, if sufficiently independent, could be given such a role.
- Giving civil society representatives decision-making power or supervisory authority over how much to spend, how to spend it, or both. This has been done in both Sao Tome and Principe and Chad,

where civil society representatives belong to the Petroleum Oversight Committee and the Collège de Contrôle, respectively.

- Writing spending rules into the contract with the bank holding the NRF. The bank has incentives to comply with its contract, and does not have the same incentives for overspending as the executive.<sup>29</sup>

The establishment of an NRF is an opportunity to vest decision-making authority in institutions that are independent of the executive. In countries with strong executive branches, however, that opportunity might sometimes not be very attractive to rulers. The regulations governing the recently established oil funds of Kazakhstan and Azerbaijan, for instance, eschew a use of this opportunity. In both of these funds, the supervisory board is controlled by the president of the country, and spending decisions are determined by presidential decrees. As before, in countries with weak institutional capacity the formal separation of powers might not be sufficient to produce genuine counterbalancing forces. Among the weaknesses identified in the case of the Collège de Contrôle in Chad, for example, are that the institution has been under-resourced, particularly in terms of skilled personnel and information; this has limited it in its ability to act as a counterbalancing force.<sup>30</sup>

Again, the aim should be to ensure not just that the right institutions are formally in place but that the incentives are properly aligned so that these institutions can function as intended. A number of legal and other mechanisms could be used to strengthen such bodies. Companies could be required to provide information directly to such bodies (in the case of Chad information is passed from companies to the executive and the Collège then relies on the executive to receive this information in a timely manner); or the agreement of such bodies could be treated as a requirement for access to fresh funds from an NRF or indeed from development partners.

### Contracting out

A problem with using NRFs to implement a separation of powers is that in many poor countries, truly independent institutions are rare. Even private actors, such as banks, may be exposed to pressure from the executive. Again there are possibilities here for governments of developing countries to draw on the institutional strength of other actors. A country with weak institutions could *in extremis* consider “contracting out” some of its political economy through an NRF, in the following sense. If the institutional resources at home do not prevent overspending, a foreign institution

might be better suited to enforce commitments by politicians. For example, spending rules could be written into a contract with foreign financial institutions in which the fund's account would be held.<sup>31</sup> More far-reaching institutional reforms could include the following:

- Rich countries could finance a “global clearinghouse” for natural resource revenue funds. This clearinghouse could deal with the logistical issues, but far more importantly, with the commitment issues. It could, for example, accept only accounts that come with strict rules on the magnitude of funds that could be withdrawn every year (as in the first subsection in this section) and only implement changes to such rules subject to some predetermined lag.
- Alternatively, the contract with the global clearinghouse might stipulate that disbursements be made only with the required signatures of several branches of government, or only pursuant to the assent of an independent control/oversight committee (as discussed in the previous section).
- To discourage the temptation to use unconstitutional means to take over the state, discussed above, the global clearinghouse could also commit to not disbursing a country's NRF monies to the new rulers after a nonconstitutional power change. For example, the account could be frozen in the case of a coup, until the régime was recognized as legitimate by an appropriate international organization.

In sum, many of the solutions we have listed might be easier to implement with the help of a foreign institution such as the suggested global clearinghouse. Such an institution is better placed to stand firm in the face of attempts to circumvent the various possible constraints on spending. In the case of breach of contract, the global clearinghouse might be prosecuted under the laws of its home government, which could provide a stronger legal regime than that of the country owning the fund.<sup>32</sup>

#### TRANSPARENCY

The third class of institutional mechanisms that could be implemented through an NRF covers those that aim to promote transparency and the dissemination of information. It bears emphasizing that the mechanisms we discussed for dividing power are also, as a side effect, transparency-promoting. With a more balanced distribution of power, we can expect that the demand and pressure for information—in particular by those

who are to participate in the shared expenditure decisions—will increase. Moreover, if it also leads to outcomes considered better by everyone, as we have suggested it may, there is plausibly less reason to be secretive about the policies that are adopted.

In addition to these effects, however, a natural resource fund can be used to put in place mechanisms that *directly* improve the flow of information in the society. For the reasons we outlined when discussing our model, transparency is likely to have salutary effects on the behavior of politicians who depend on popular support, at least if voters are prepared to punish incumbents for inefficiencies.<sup>33</sup> Of course transparency should not be limited to revenues originating from the natural resource sector. But in countries with low levels of transparency in general, the occasion of setting up an NRF may provide an opportunity to create a sphere with better practice than the rest of the public sector. Indeed a successfully transparent NRF could have spillover effects both on the government's technical capacity and on the pressure on it to increase transparency elsewhere.

#### Publication of transactions

These considerations suggest that all information about the decisions and transactions of NRFs should be public. In particular, all *payers* of natural resource revenue should publish their payments in detail, so that it is possible to certify that the NRF is in fact receiving what it should. In addition, the NRF itself should be required to publish details of all its transactions. Both of these are more easily said than done. Institutional provisions can, however, facilitate both goals. The requirement that payers publish payments, for example, can be introduced into contracts with corporations and other parties. If nonpublication thus constituted a possible cause for contract annulment by host countries, companies would have an incentive to publish the required information. To routinize publication of receipts by governments, on the other hand, one possibility is to contract with the agency that houses the fund—for example an international bank—to make information on holdings, deposits, and withdrawals available in real time online, much as is the case for private accounts with commercial banks.<sup>34</sup> Finally, information on the NRF's transactions should be audited by competent and independent auditors.

These suggested mechanisms for greater transparency draw on the strength of international contractual relations. Other mechanisms emphasize domestic oversight. One approach is to create institutions specifically for

information dissemination and oversight that operate independently of the executive. Such agencies should in all cases be sufficiently financed to do their job properly and independently of the executive and represent a diversity of political actors. To give teeth to such institutions, they could eventually be provided with the power to halt transfers out of the NRF in case of insufficient information (or the standing to request courts to do so, provided there is sufficient judicial independence).

In practice, there have been many recent developments around initiatives to improve transparency. Some countries have gone very far in the use of legal mechanisms, requiring all information relating to natural resource exploitation and related revenues to be made public, to the point of voiding contracts that do not comply with this, such as in Sao Tome and Principe.<sup>35</sup> Others have relied on domestic institutions; in Chad, for example, much of the oversight depends on the Collège de Contrôle, an institution that by many accounts has not been given adequate resources to do the monitoring expected of it (Catholic Relief Services 2005).

#### Unified budgets

It is important to be aware that some of the other institutional devices we have recommended considering—in particular dividing the authority to make different spending decisions—carry the risk of confusing and obfuscating the overall budget process. This is as serious a threat to transparency and efficient information flows as imperfect publication. It is therefore essential that even as decisions are made by different entities, there is clarity as to what they are and how they affect each other. A minimum condition for this is that there be a single budget for public expenditures. To keep public finances orderly and transparent, it is vital that an NRF not have a separate budget for the spending of oil-derived revenues; instead, it should only transfer funds directly to the national budget. This is not to say that proceeds from the NRF may not be earmarked for such specified purposes as development spending or pension expenditures—on the contrary, we have suggested that such rules can be useful if designed judiciously. But such allocations should happen through the normal budget, rather than being kept off-budget. This will mean that there will be legal constraints on how the general government budget can allocate expenditures to different uses.

A unified budget facilitates transparency; it also helps address a core problem dogging the use of NRFs: that of “fungibility.” The fungibility

of monetary resources means that even if an NRF reins in overspending of natural resource-generated revenues, the overspending can reappear in other parts of government expenditures. Fungibility is sometimes taken as a reason to be skeptical of the ability of NRFs to change policy makers' incentives: Even if the NRF effectively limits overspending the resources *it* controls, the government may simply overspend in the part of the budget beyond the reach of the institutional constraints of the NRF. This argument is powerful; however, if an NRF can be made to work, fungibility is less of a problem precisely in those countries where overspending is more of a problem—that is, where accumulated natural resource revenues are very large relative to other government resources. This is because the larger the share of government resources that are subject to the types of constraints we have outlined, the less other resources are available to undo the overall restraining impact on spending. The more general implication of the fungibility problem is that ideally, the institutional solutions to the political economy problem (such as greater levels of transparency and oversight) should be applied to the *entire* system of government finances, and not just the part deriving from natural resource exploitation or that managed by an NRF. Insofar as the mechanisms that we have described in this section can be implemented across the public sector, they should be. Since in practice, local reform is often easier than general reform, the establishment of an NRF should be used as an opportunity to carve out a space within the public sector in which the appropriate mechanisms can be put to work in a highly visible manner.

We conclude by noting that some of these transparency conditions could also be well handled by a global clearing house or by a financial institution that houses the NRF. An international agency may simply be better equipped for such information-intensive tasks in purely logistical terms, compared to some of the poorest natural resource-exporting countries. And as with the power-sharing mechanisms, the transparency mechanisms could be included in the contract setting up the account for the NRF such that banks, as a matter of contractual obligation, are required to publicly report all transactions related to the management of an NRF.

### CONCLUSION

There is a simple reason why natural resource revenue funds do not on average contribute to better fiscal policy in countries heavily dependent on



natural resource exports. The reason is that the economic considerations that are usually used to motivate funds support only a certain optimal fiscal policy, and are silent on what is the right institutional framework for implementing that policy. However, the political economy of power rivalry can create incentives for rapid overspending of natural resource revenues relative to the ideal levels of expenditure of any given government.<sup>36</sup> We argue that these adverse effects are strongest when political divisions are deep, when institutions are otherwise weak, where political power is concentrated, where transparency is limited, and where there are risks of rapid changes of government. This analysis, we argue, is supported by the empirical evidence available on expenditure in resource-rich countries. The concerns we highlight, then, are very real.

An NRF is not a panacea for these problems and the incentives to spend too rapidly persist whether or not an NRF is established. The obvious difficulty is that NRFs are least needed when institutions are strong; but they are least likely to work in precisely those institutionally weak environments where they appear to be most needed. A fund that does not address the incentives of governments is subject to being abolished or ignored. The case of Chad is instructive in this respect. In the worst cases, if funds are designed such that they are under the control of a small number of actors, nontransparent and poorly linked with budgetary processes, they may render the problems we identify more severe (Davis et al. 2001).

The question then is whether NRFs can be used to realign incentives in a way that makes them self-enforcing. There appear to be a number of possibilities for this. We describe three families of responses. If the NRFs render discretionary uses of finances more difficult in the future this can reduce the incentives to spend too much now. A broadening of decision-making authority may have a similar effect if it leads to greater predictability and moderation in future spending. So too we may expect NRFs to have beneficial effects if they increase transparency by providing a simple summary to voters of the government's overall success at managing resource wealth and alerting them to misuses of revenue.

Which exact model is best for a given country will depend on the circumstances of that country. While the solutions we propose are a priori promising, future research can help deepen our understanding of why funds so often seem to fail. An important research question is exactly how funds interact with the overall institutional structure of the country.

More research is also needed on the possible institutional solutions to the political economy problems that we listed. We argued that in various contexts, some of these might encourage more cooperative behavior on the part of policy makers over time by dividing authority and increasing transparency and information. Both theoretical and empirical work would be needed to establish with more certainty the expected effects of each specific proposal. In particular, it would be informative to investigate in more detail our conjecture that many of the domestic incentive problems could be alleviated by a global clearinghouse that would take on the responsibility of running the fund, partly sheltered from the incentives prevailing in the domestic political economy of the country.

In all cases, the core message here is that designers of natural resource revenue funds should look first to the political incentives in their country, and attempt to design fund rules that not only approximate the optimal fiscal policy, but, more importantly, create political incentives (or at least mitigate political disincentives) for abiding by that policy. Unless they alter the incentives of political actors, resource funds will not help solve any of the economic problems facing resource-rich countries. For cases in which the domestic institutional environment is too weak to overcome the problems we identify in the short run, we argue that policy makers in natural resource-rich countries can consider a series of creative ways to draw on the strength of external institutions. Such innovations could include provisions to invest assets in fixed term investments, to require companies and banks to render information public or to provide it on request to multiple branches of government, or to freeze accounts under specified conditions such as in the event of an unconstitutional change of government. Engaged correctly, such innovations would not impinge on sovereignty but would rather help strengthen the state and its ability to engage in consistent long-term planning and protect it from abuse by small but powerful constituencies.

#### NOTES

1. For details about the Norwegian fund, see [http://www.norges-bank.no/english/petroleum\\_fund/](http://www.norges-bank.no/english/petroleum_fund/).

2. The *economic* challenges of fiscal policy in natural resource-rich countries have been analyzed in great detail. For a recent collection of insightful essays, see Davis et al. (2003); see also chapter 7 of this volume.

3. Formally, the argument can be made by considering the case of a benevolent “social planner” that seeks to maximize a social welfare function of the form:

$$V(X_1, X_2, \dots, X_\infty) = \sum_{t=1}^{\infty} \delta^{t-1} u(X_t)$$

where  $X_t$  is public spending in period  $t$ , the social benefit of which is given by  $u(X_t)$ . This benefit is discounted by a discount factor  $\delta$  less than 1. The present value of all future spending must not exceed the sum of current wealth,  $A_0$ , and the present value of future incomes,  $Y_t$ , given the interest rate  $r$ . This can be expressed as an intertemporal budget constraint of the form

$$\sum_{t=1}^{\infty} (1+r)^{1-t} X_t \leq A_0 + \sum_{t=1}^{\infty} (1+r)^{1-t} Y_t$$

The solution to this problem is expressed in what is known as the “Euler equation,” which holds at all times  $t$ :

$$\frac{u'(X_t)}{u'(X_{t+1})} = \delta(1+r).$$

The Euler equation implies that the rate of change in spending should not vary from year to year (so long as the interest rate is unchanging). This could involve a falling or rising time path of expenditures, but in any case the adjustments from one year to the next are regular, and spending should not go up *and* down. If the prevailing interest rate accurately reflects the impatience, that is, where  $\delta = 1/(1+r)$ , the optimal policy holds spending *constant* from year to year. This simple example is merely illustrative. A proper technical analysis of optimal fiscal strategy in natural resource exporting countries can be found for example in Engel and Valdés (2000).

4. Nor is there any obvious economic reason *not* to have a fund. Once the optimal policy is determined, it is relatively straightforward to design a fund with rules that in principle carry it out (see Engel and Valdés 2000, section 7, and the studies cited there). The relevant criteria for whether to have an NRF or not are therefore those of political economy, not of economics.

5. Information about oil revenue management in Sao Tome and Principe is available on <http://www.earthinstitute.columbia.edu/cgsd/STP>. See also chapter 11.

6. The International Monetary Fund’s country reports on Azerbaijan and Kazakhstan (International Monetary Fund 2003, 2004) provide information on these funds.

7. The East Timorese law establishing a Petroleum Fund is available at [http://www.transparency.gov.tl/PA/pf\\_act.htm](http://www.transparency.gov.tl/PA/pf_act.htm).

8. A formal version of the model described in this chapter is available in an appendix available online at <http://www.martinsandbu.net/docs/academic/funds>. Here we describe the assumptions behind the model and the findings in words, and refer the reader interested in the technical derivations to the appendix.

9. Specifically, we assume that they want to maximize a weighted average of the benefits to the two groups, where the weight on one's own group is of course higher than that on the other group. See formal derivation.

10. More precisely, the division is given by 
$$X_1 = \frac{1}{1 + \delta^{1/\rho}}, X_2 = \frac{\delta^{1/\rho}}{1 + \delta^{1/\rho}}.$$

11. Some aspects of fiscal and monetary policy that rely on responses by the private sector or other actors may generate inconsistency over time (see, e.g., Dixit and Londregan 1995; Garfinkel and Lee 2000; Kydland and Prescott 1977).

12. To elaborate, there are at least three reasons why Findings 3 and 4 do not imply that democracies have less efficient spending patterns than dictatorship. First, as we suggest in the main text, dictatorships may well have a higher probability that power changes. Elections are not the only thing that can threaten an incumbent's hold on power, and dictators must typically worry more about extraconstitutional changes of power like *coups d'état*. Finding 3 is not about the *duration* of régimes, but about their expected planning horizon, where governments more secure in their power will plan for the longer term. Second, Finding 3 is based on the assumption that  $q$  is fixed, and in particular, that the probability of a change in government is not affected by the incumbent's spending decision. We relax this assumption below, where we show that when the incumbent's political support depends negatively on overspending in the first period, she will restrain spending. If this feedback in political support is stronger in democracies, as one may plausibly think, then democracies will see more efficient spending than dictatorships. Finally, in democratic countries where the rule of law is strong there may be less profound internal divisions and less biased policy makers, for example, because of the more predictable policy environment and the limits on what governments can do. As Finding 4 shows, less bias leads to less overspending.

13. In the language of political economists, the increase in first-period spending results in a Pareto-inefficient expenditure profile.

14. This is a consequence of diminishing marginal utility. The prospect of high spending in one state of the world is not enough to outweigh a correspondingly low level of spending in other states of the world. Policy makers would therefore prefer to secure similar levels of spending and benefit in all potential situations—they are averse to risk.

15. But note that this solution only requires the commitment on behalf on one player—the challenger—not both, as in the risk-sharing solution.

16. See section 13.3 of Persson and Tabellini (2000) for a discussion of conditions under which this is likely to hold.

17. Note that this is mathematically equivalent to treating the probability that a policy maker *remains* in office as an increasing function of the *spent* assets.

18. Note that the oil measure employed captures estimated total earnings from national oil production rather than government revenue from oil alone. For more information on the oil measure employed here, see Humphreys (2005).

19. It uses information on the presence of independent participants in the political process, including the number of different parties in a governing coalition and the extent to which there is a competitive legislature independent of the president or prime minister's party.

20. This calculation assumes that oil sales and oil revenues are proportional to each other.

21. This economic question is addressed in chapter 7.

22. Clearly, limiting spending to a function of revenues is inferior from an economic point of view to limiting it to a function of wealth, inasmuch as a purpose of the fund is to divorce spending patterns from year-to-year revenue fluctuations. Even on this question, however, one must take into consideration how political pressures may act differently on the two types of constraints.

23. This was true, for example, of the Fund for Stabilization, Social and Productive Investment and Reduction of the Public Debt (FEIREP) in 2002–2005, whose resources had to be spent on debt reduction (70 percent), public revenue and emergency spending (20 percent), and health and education (10 percent). The aggregate amount spent, however, was left to be determined by presidential decree. The same seems to be true for FEIREP's successor, although the exact allowed expenditures have been changed.

24. The Oil Revenue Management Law of Sao Tome and Principe states the following: "The allocation of the Annual Funding Amount shall be decentralized with respect to sectors and territory, and aimed at the elimination of poverty and the improvement of the quality of life of the Saotomean people, the promotion of good governance, and social and economic development. In addition, such allocation shall be used, namely, to strengthen the efficiency and effectiveness of the State Administration, to ensure a harmonious and integrated development of the Country, a fair sharing of the national wealth, the coordination between economic policy and social, educational and cultural policies, rural development, preservation of the ecological balance, environmental protection, the protection of human rights, and equality among citizens before the law."

25. Recall our discussion of tacit coordination at the end of the section "Political Economy Incentives Against Accumulation." When policy makers engage in repeated interactions over a lengthy period of time, a reciprocating attitude may arise. When this happens, an incumbent will refrain from overspending today in the expectation that challengers who gain power in the future will do the same, since this will benefit the today's incumbent when she at some point returns to power again. If such expectations take hold, they may become self-fulfilling. NRF rules, even if they do not by themselves create incentives for restraint, may help generate such expectations and serve as a benchmark for identifying when one or another party has failed on their side of the agreement.

26. A case in point is Chad, whose strict rules on how oil revenues from the Doha fields and the Chad–Cameroon pipeline could be spent were changed unilaterally in

early 2006. Before its demise Ecuador's FEIREP's website reported transactions that, while not in real time, remained very up to date.

27. The Alberta Heritage Savings Trust Fund Act provides that its standing committee include 3 members (out of 9) who are members of the Legislative Assembly but not members of the governing party. While a minority, this does give the opposition some influence on decisions concerning the fund. See <http://www.qp.gov.ab.ca/Documents/acts/A23.CFM>.

28. Colombia's 1995 law which regulates the Fund of Petroleum Saving and Stabilization imposes stabilizing rules for municipalities' aggregate spending of their share of oil royalties, without specifying on what the local authorities must spend the available amounts.

29. This possible mechanism is not restricted to the government's relationship with private banks. The Central Bank of Ecuador, for example, managed FEIREP (see footnote 22) as a legally contracted fiduciary, whose contractual terms explicitly allowed it not to disburse monies from the fund unless requested to do so in the legally prescribed manner.

30. See Catholic Relief Services (2005).

31. Sao Tome and Principe has attempted to set up such a relationship with the Federal Reserve Bank of New York (see chapter 11 for more detail).

32. We recognize, of course, that this proposal may run up against problems of sovereignty. But the idea is not to devolve sovereignty. The global clearing house would act as the agent and the sovereign country as the principal in this relationship, but it would permit the latter to solve commitment problems by using the agent as a proxy in certain short-term decisions. This is not too different from the way democratic governments devolve certain decision-making powers in monetary policy to independent central banks. The difference between devolving such authority to the domestic central bank and a foreign bank is that the former is subject to the country's own laws. The situation we are considering, in contrast, is one in which the rule of law is stronger in the country of the foreign bank than in the natural resource-exporting country itself. In a sense, making use of a stronger legal regime abroad might paradoxically increase the government's ability to exercise its sovereignty, as a wider range of policy options become achievable—in particular the desirable one of accumulating oil revenues.

33. This has been recognized by several recent international policy initiatives, in particular the intergovernmental Extractive Industries Transparency Initiative and the non-governmental Publish What You Pay coalition (see chapter 10).

34. Before its demise Ecuador's FEIREP's website reported transactions that, while not in real time, remained very up to date.

35. Information pertaining to "proprietary industrial property rights" can be exempted, but not financial information.

36. Again, it is very important to note that our analysis is silent on the economic question of what is the optimal amount to spend in any given year; rather it shows that once the optimal amount is identified from an economic point of view, there will be political incentives to spend beyond that amount.

## REFERENCES

- Ainslie, G. and N. Haslam. 1992. "Hyperbolic Discounting." In *Choice Over Time*. J. Elster and G. Loewenstein, eds. New York: Russell Sage Foundation.
- Alesina, A. 1988. "Credibility and Policy Convergence in a Two-Party System with Rational Voters." *The American Economic Review* 78(4): 796–805.
- Barro, R. 1973. "The Control of Politicians: An Economic Model." *Public Choice* 14: 19–42.
- Bates, R. 1981. *Markets and States in Tropical Africa*. Berkeley: University of California Press.
- Beck, T., G. Clarke, A. Groff, P. Keefer, and P. Walsh. 2000. "New Tools and New Tests in Comparative Political Economy." World Bank Working Paper. Washington, DC: World Bank.
- Catholic Relief Services. 2005. *Chad's Oil: Miracle or Mirage? Following the Money in Africa's Newest Petro-State*. Baltimore: Catholic Relief Services and Bank Information Center.
- Davis, J., R. Ossowski, J. Daniel, and S. Barnett. 2001. "Oil Funds: Problems Posing as Solutions?" *Finance and Development* 38: 4. Washington, DC: International Monetary Fund.
- Davis, J., R. Ossowski, J. Daniel, and S. Barnett. 2003. "Stabilization and Savings Funds for Nonrenewable Resources." In *Fiscal Policy Formulation and Implementation in Oil-Producing Countries*, J. Davis, R. Ossowski, and O. Fedelino, eds. Washington, DC: International Monetary Fund.
- Davis, J., R. Ossowski, and O. Fedelino, eds. 2003. *Fiscal Policy Formulation and Implementation in Oil-Producing Countries*. Washington, DC: International Monetary Fund.
- Dixit, A., G. M. Grossman, and F. Gul. 2000. "The Dynamics of Political Compromise." *Journal of Political Economy* 108(3): 531–68.
- Dixit, A. and J. Londregan. 1995. "Redistributive Politics and Economic Efficiency." *American Political Science Review* 89(4): 856–66.
- Engel, E. and R. Valdés. 2000. "Optimal Fiscal Strategy for Oil Exporting Countries." IMF Working Paper WP/00/118. Washington, DC: International Monetary Fund.
- Fasano, U. 2000. "Review of the Experience with Oil Stabilization and Savings Funds in Selected Countries." IMF Working Paper. Washington, DC: International Monetary Fund.
- Fearon, J. D. and D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review* 97(1): 75–91.
- Ferejohn, J. 1986. "Incumbent Performance and Electoral Control." *Public Choice* 50: 5–26.
- Garfinkel, M. R. and J. Lee. 2000. "Political Influence and the Dynamic Consistency of Policy." *The American Economic Review* 90(3): 649–66.
- Humphreys, M. 2005. "Natural Resources, Conflict and Conflict Resolution." *Journal of Conflict Resolution* 49(4): 508–37.
- International Monetary Fund. 2003. *Azerbaijan Republic—Selected Issues and Statistical Appendix*. IMF Country Report No. 03/130. Washington, DC: International Monetary Fund.

- International Monetary Fund. 2004. *Republic of Kazakhstan—Selected Issues*. IMF Country Report. Washington, DC: International Monetary Fund.
- Kydland, F. and E. Prescott. 1977. “Rules Rather than Discretion: The Inconsistency of Optimal Plans.” *Journal of Political Economy* 85: 473–90.
- Persson, T. and G. Tabellini. 2000. *Political Economics: Explaining Economic Policy (Zeuthen Lectures)*. Cambridge, MA: The MIT Press.
- Robinson, J. A., R. Torvik, and T. Verdier. 2005. “Political Foundations of the Resource Curse.” Unpublished manuscript.