

Subnational Oil, Gas and Mineral Revenue Management

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SUMMARY

Subnational¹ resource-rich governments face four distinct challenges in managing revenues from volatile, exhaustible resources:

- 1 unpredictable and discretionary resource revenue transfers between national and subnational governments, which, combined with poor forecasting capacity, can undermine development planning;
- 2 over the short- to medium-term, resource revenue volatility which can lead to wasteful spending, poor quality investments, an unpredictable business environment, and ultimately slow non-resource sector growth;
- 3 over the longer term, the finite nature of oil, gas and mineral revenues, which can lead to a long period of economic growth followed by a depression; and
- 4 difficulty in scaling up public investment efficiently when experiencing a revenue windfall.

To address short- to medium-term revenue volatility, subnational governments can “smooth” expenditures by delinking revenues from expenditures. When revenues are unexpectedly high, governments can run a surplus, to be saved or used to pay down public debt. When revenues are unexpectedly low, they can draw on those savings or borrow. To prevent long-term booms and busts, governments can also save a portion of resource revenues for future generations, as well as invest in the local economy to generate future growth. *Fiscal rules* can underpin these policies, constraining government spending decisions and compelling government bodies to adopt a long-term perspective on public finances. Fiscal rules may require medium- to long-term revenue forecasts, which can help a subnational government plan its saving or borrowing.

Development planning can help prepare resource-rich regions for life after their oil, gas or minerals have been depleted. Planning helps prevent shortsighted reactions to temporary ebbs and flows in oil or mineral revenues, helps define the role of the resource sector in development, and lays the groundwork for a thriving post-extractive economy. Development plans should be detailed and focus on investments in high-potential sectors, and in health, education and infrastructure. They should also be formally linked to the annual budget—for instance, via a medium-term expenditure framework (MTEF).

1 “Subnational government” in this paper refers to both regional and district governments.

CONTENTS

Summary	1
Introduction	2
Revenue management by subnational governments: policy options	6
Advancing transparency of direct social expenditures: learning from CSOs.....	13
Conclusion	22
Annex.....	23

Poor public service provision can undermine development plans. While all governments require strong public financial management, those experiencing resource booms are particularly susceptible to unproductive spending. Subnational governments should invest in the investment process by improving budgeting, project appraisal, public procurement and evaluation procedures. When combined, expenditure smoothing, development planning and investing in the investment process can help subnational governments overcome the economic and developmental challenges so many resource-rich regions experience.

INTRODUCTION

The small coastal district of Ite in southern Peru has seen a boom in recent years. Thanks to tax revenue from the local copper mine, mostly collected by the national authorities and then transferred to the local level, the municipal government budget has jumped from less than \$500,000 to more than \$13 million annually. Peruvian law requires these subnational funds to be used for investment projects, so the municipality has embarked on a race to build infrastructure. As reported, “in addition to the town’s perfectly maintained roadways, the infrastructure projects also included an oceanside statue, a stadium, three schools, a football court, a playground and a modern, mirror-sided municipal building abutting the district’s new main square.”²

This spending glut on infrastructure, financed by resource revenues, has had a noticeable side effect: a rise in construction wages. In response, farmers and agricultural laborers have been drawn out of the fields and into the construction sector, lowering agricultural output.

The new infrastructure has benefited residents of Ite. However the municipality lacks both the long-term public investments and the financial savings to maintain the current standard of living far into the future. Inadequate resources have been devoted to training teachers, building health systems and financing social programs that will benefit future generations. Mining revenues have been largely consumed rather than invested or saved. And the movement of labor away from the agricultural sector threatens the region’s agricultural prospects well into the future. Once the copper mine has been depleted, Ite risks a decline in standards of living, perhaps even leaving citizens worse off than before the boom.

Ite illustrates the economic challenges that arise when a resource-rich region experiences a large influx of oil, gas and mineral revenues. Prices and wages tend to increase, and financial and human resources are drawn away from other sectors into the extractive sector and non-tradable activities, like construction, taxis and restaurant services. Non-resource “tradable” sectors, like manufacturing and agriculture, tend to dwindle and become uncompetitive. This subnational “Dutch disease” effect is well documented in Brazil, Indonesia and Peru.³

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2 Claudia Viale, “Cholo Disease: Resource Revenue and Local,” Revenue Watch Institute, <http://www.revenuewatch.org/news/blog/cholo-disease-resource-revenue-and-local-economies>

3 See, e.g., James Cust, “The Spatial Effects of Resource Extraction: Mining in Indonesia,” OxCarre, <https://editorialexpress.com/cgi-bin/conference/download.cgi?dbname=CSAE2012&paperid=413>; Francesco Caselli and Guy Michaels, “Do Oil Windfalls Improve Living Standards? Evidence from Brazil,” London School of Economics (2009); Fernando Aragon and Juan Rud, “The Blessing of Natural Resources: Evidence from a Peruvian Gold Mine,” Banco Central de Reserva del Perú (2009); Joshua D. Angrist and Adriana Kugler, “Rural Windfall or a New Resource Curse? Coca, Income and Civil Conflict in Colombia,” NBER Working Paper No.11219 (2005).

The sudden influx of significant oil, gas or mineral revenues combined with local fiscal policy based on short-term thinking also tends to generate incentives for overconsumption or wasteful spending. Resource-rich governments often spend what they receive in revenues, causing booms and busts in public expenditures and private-sector production in response to rises and falls in government expenditures. This expenditure volatility encourages poor spending decisions. Macro incentives that foster wasteful spending are often exacerbated by poor public financial management systems, including insufficient development planning, procurement procedures and project monitoring.

Inefficient responses to revenue windfalls are not exclusive to low- or middle-income countries. The Canadian province of Alberta has reacted similarly to windfall revenues from oil sands exploitation. Despite having established a savings fund in 1976 “to collect a portion of Alberta’s nonrenewable resource revenue for future generations,” the provincial government chose to spend its approximately \$10 billion price-induced windfall from 2004–08. (See Figure 1.) Even prior to the boom, Alberta was Canada’s richest province, with few public spending needs relative to other Canadian provinces or most other parts of the world; in 2011, per capita GDP was more than \$78,000 (Statistics Canada). Today, with oil prices dropping, Alberta is facing a fiscal crisis; its government expects a 2013 budget deficit of \$6.3 billion.

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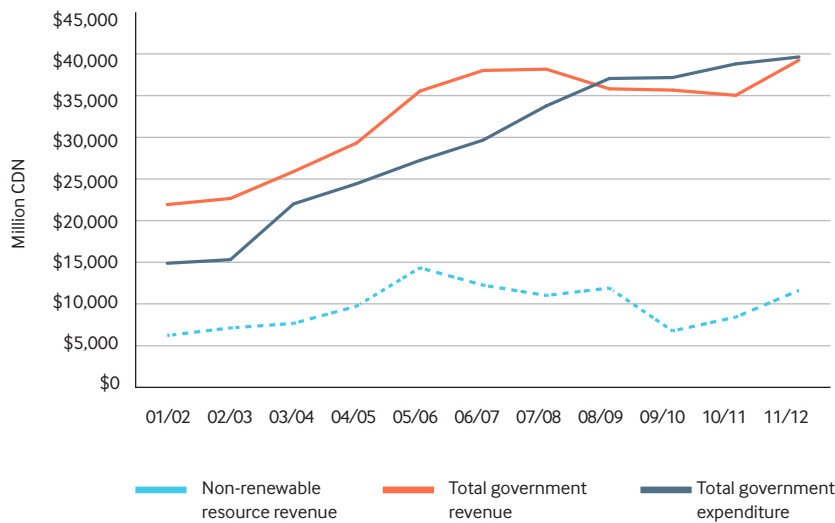


Figure 1. Alberta’s government finances
Data Sources: Alberta Treasury Board & Finance; Alberta Energy

This paper provides guidance on the management of oil, gas and mineral revenues by subnational governments. It applies exclusively to resource-rich governments and takes resource revenue flows from the national government and the institutional relationships between the national and subnational governments as givens.

Part 1 discusses four revenue management challenges faced by resource-rich governments: the lack of revenue predictability; short- to medium-term revenue volatility; managing long-term production cycles; and addressing the quality of public spending.

Part 2 discusses policy options for subnational governments. Among the options are fiscal rules to smooth public expenditures and save resource revenues. The implementation of fiscal rules may require forecasting revenue flows, effectively managing natural resource funds or trust funds, and effectively managing public debt. Development planning, establishing a medium-term expenditure framework and

investing in the public investment process are also discussed. Part 3 offers some high-level conclusions.

Revenue management challenges for resource-rich subnational governments

Before discussing the challenges, it may be important to examine these fiscal relationships between national and subnational governments. After all, one of the things that makes subnational resource revenue management unique is that most subnational governments are “rule-takers” and “revenue-takers,” in that they are constrained in their set of policy options by national-level legislation, regulation or policy and, except in particular cases, do not collect the majority of resource revenues. Some of these constraints may be in place for good reason—for example, to protect the subnational government from over-indebtedness or debt crises; however, they may also limit the choices available to deal with the challenges associated with resource revenue management.

In many countries, subnational jurisdictions have some taxation powers or may levy surface fees; this is the case, for instance, in Argentina, Australia, Bolivia, Canada, China, Indonesia, Mexico, Papua New Guinea, the Philippines, the UAE and the United States. (See Annex 2 for taxation authority allocated between local, provincial and national governments in selected countries in 2000.) However, in the majority of countries—with the exceptions of Canada, the UAE and the U.S.—revenues collected directly by subnational governments in the form of taxes or fees are extremely small compared with oil or mineral payments made to the national government and transferred to subnational levels.

In fact, transfers from the central government are the principal source of resource revenues for most subnational governments. In some countries, like Brazil, Ghana, Indonesia and Nigeria, there are actually two separate intergovernmental transfer programs: a general tax pool transfer, and a separate, derivation-based transfer that applies only to mineral, oil or gas revenues. In other countries, like Canada, the United States and South Africa, there is only a general transfer.

General transfers from the central government are the primary method of financing for most subnational governments. In these cases, resource revenues are often part of a larger pool of income collected from different national taxes. These monies are then distributed universally among all subnational governments according to a formula, regardless of whether the subnational region is resource-producing. In Nigeria, the amount distributed is called the “statutory amount.” In Canada, it is called “equalization payments.” In South Africa, it is an “equitable share” transfer.

Under derivation-based systems, transferred funds may come solely from resource revenues. The formula that determines how much each subnational government receives may be based on the proportion each jurisdiction contributes to total national oil, mine or gas production. Such transfer systems exist in Brazil, Ghana, Indonesia, Nigeria and Peru. (See Figure 2 for Indonesia’s oil revenue derivation-based system.) These revenue-sharing regimes have recently come under high-profile scrutiny, particularly in Brazil, where a bill to share revenues more evenly between regions spawned mass protests in Rio de Janeiro, the largest recipient of oil revenues.⁴

4 Thalita Carrico, “Rio: loser in Brazil’s oil royalty row,” Financial Times (March 15, 2013), <http://blogs.ft.com/beyond-brics/2013/03/15/rio-biggest-loser-in-brazils-oil-royalty-row/#axzz2Ogu3mL5M>

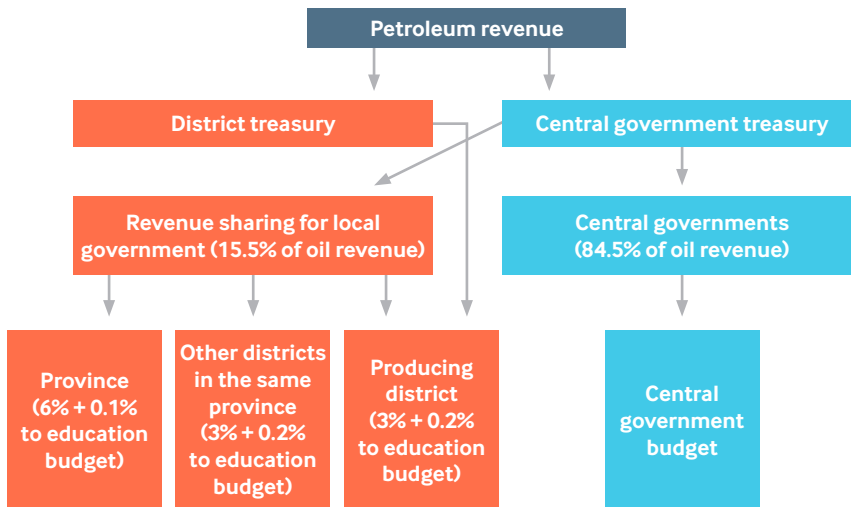


Figure 2. Indonesia's Petroleum Revenue Sharing Regime

In each country, this oil, gas or mineral revenue transfer has a different name. In Indonesia, it is called the Dana Bagi Hasil (DBH) Migas or oil revenue sharing; in Nigeria, it is simply called the Derivation Fund 13 percent transfer. A survey of 58 resource-rich countries from the Natural Resource Governance Institute found that 30 have central-subnational oil-, gas- or mineral-specific revenue-sharing systems. In countries like Nigeria and Peru, more than 80 percent of some regional governments' budgets depend on resource revenue transfers from central governments. Some countries, such as Ghana or the Philippines, also share resource revenues with other local entities, like indigenous groups and kingdoms.⁵

Local governments, like the Peruvian municipalities of Echarate and Ilabaya, can become dependent on these national government transfers of oil, gas or mineral revenues. Echarate (population 42,000) received \$257 million from central government gas revenue sharing in 2012, constituting 96 percent of its \$268 million municipal budget. Ilabaya (population 4,000) received \$56 million from copper revenues in 2012, representing 94 percent of its annual budget.

In many countries, like Brazil, the Philippines and South Africa, subnational governments have been allocated key expenditure responsibilities, such as education, public order and safety, social protection and transportation. Thus, in these countries, resource revenues simply add to the fiscal space available to provide these services. In other countries, like Kazakhstan and Uganda, subnational governments have very few direct responsibilities. In these cases, windfall resource revenues are in a sense "extra" money for local authorities to allocate.⁶

In both cases, spikes in oil, gas and mineral revenues can destabilize the local economy, lead to wasteful spending, undermine accountability and increase conflict over

5 Matteo Morgandi, "Extractive Industries Revenues Distribution at the Sub-National Level," Revenue Watch Institute, <http://www.revenuewatch.org/training/resourcecenter/extractive-industries-revenues-distribution-sub-national-level>

6 Sebastian Eckardt and Anwar Shah, "Decentralized Governance in Developing and Transition Countries: A Comparative Review," *Macro Federalism and Local Finance* (ed. Anwar Shah), (Washington: World Bank, 2008).

control of natural resources.⁷ While poor outcomes could theoretically be addressed by reforming the institutional relationship between national and subnational governments or the rules that govern intergovernmental transfer, we will take the current relationships and rules as givens in this paper. We will limit our discussion to the challenges and policy options available to subnational jurisdictions with limited control over fiscal levers and, in many cases, less institutional capacity than national jurisdictions. The four challenges we will elaborate on here are:

- 1 Forecasting and collecting revenue entitlements
- 2 Managing short- to medium-term revenue volatility
- 3 Managing the long-term production cycle
- 4 Improving the quality of public spending

Forecasting and collecting revenue entitlements

In jurisdictions that receive a share of resource revenues from the national government, it is often unclear whether subnational governments are actually receiving all the revenue they are entitled to. This may be because:

- a) the revenue sharing formula is unclear;
- b) there is insufficient information available to verify entitlements (e.g., company payments to the national government and contracts are secret; there is a lack of data on production volumes, prices or costs);
- c) subnational governments do not have the capacity to model complex revenue streams to verify entitlements; or
- d) lack of coordination between the national and subnational governments prevents timely and accurate intergovernmental transfers.

For example, in the Democratic Republic of the Congo, Ghana and the Philippines, local governments rarely know how much they are owed in oil, gas and mineral revenues and whether they are receiving the correct amount. This lack of information about revenue sharing and the volatile nature of oil, gas and mineral revenues combine to make planning the annual budget quite difficult. It is therefore not unusual for subnational governments to vastly underestimate or overestimate revenues. The oil-rich Nigerian state of Bayelsa, for instance, underestimated revenues by 97 percent in 2000 and overestimated revenues by 20 percent in 2007.⁸

A widely accepted, equitable, rules-based, predictable and transparent oil, gas or mineral revenue-sharing regime is a critical element of sound economic management at the subnational level. Revenue-sharing formulas, including both the split in natural resource taxation rights and intergovernmental transfers, are regularly renegotiated in response to changing political and economic circumstances. For instance, Brazil has revised its oil and gas revenue-sharing formula three times since 1989. Bolivia's revenue-sharing rules have undergone at least four changes since 2005. Indonesia has renegotiated at least three times since 1999.⁹ That said, since the relationship between

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7 See e.g., Fernanda Brolo et al. "The Political Resource Curse," National Bureau of Economic Research Working Paper 15705 (2010); Joana Monteiro and Claudio Ferraz. "Resource Booms and Voracious Politicians: The Effects of Oil Shocks on Patronage, Rent-seeking, and Elections" (2009); Caselli and Michaels; Javier Arellano-Yanguas, "A Thoroughly Modern Resource Curse? The New Natural Resource Policy Agenda and the Mining Revival in Peru," IDS Working Paper 300 (2008).
 8 Banabo Ekankumo and Koroye Braye Henry, "Stimulating internally generated revenue in Nigeria: the entrepreneurial option revisited," European Journal of Social Sciences Vol. 24, No. 4 (2011).
 9 Morgandi.

national and subnational governments is complex, deserving of a separate paper, and the aim of this paper is to provide practical guidance on how to manage resource revenues, we will focus on the revenue management challenges expected to be under the direct control of subnational governments. Further readings on oil, gas and mineral revenue sharing and inter-governmental transfers can be found in Annex 3.

Managing short- to medium-term revenue volatility

Oil, gas and mineral prices and production are volatile and unpredictable. In 2008, oil prices crashed from \$132 to \$40 per barrel in about six months. By April 2011, they had risen again to \$123 per barrel. Copper prices have been equally volatile, especially over the last eight years. For example, during the financial crisis, copper prices dropped from near \$4 per pound to \$1.40 and recovered to \$4.50 by 2011. Production can also decline unexpectedly—say, as a result of technological breakdown or mining conflict, as we have seen recently in Peru and South Africa.

Since gross oil or mineral revenues are determined by volume multiplied by price, and oil and mineral contracts are often structured such that prices have a direct impact on government take, this short- to medium-term price and production volatility makes it difficult to predict revenues. Uncertain revenues in turn make it difficult to know how much is available for government spending. And since most subnational governments spend all the money they receive, uncertain revenues make it difficult to plan a credible budget. All too often the result is “pro-cyclical” fiscal policy—i.e., government expenditures rising significantly when such resource revenues increase and falling when they drop off.

Highly volatile budget expenditures create perverse incentives to spend funds poorly.¹⁰ Often, an increase in oil or mineral revenues is treated as permanent and to be spent immediately, engendering spending on legacy projects like fountains and expensive government buildings (e.g., Kazakhstan’s new presidential palace or Ittekk’s new municipal building); on the other hand, a decline in revenues is treated as temporary, leading to an increase in public debt or expenditure cuts, leaving roads half-finished or unmaintained buildings. Resource-rich governments rarely take the time to plan investments that will promote sustainable economic development and serve the population for years. In Azerbaijan, for example, despite 29 percent of the rural population not having access to clean water, and despite spending only 11 percent of the budget on education, the government is spending billions of dollars on new stadiums, a headquarters for their sovereign wealth fund, a concert hall and a conference center, all planned when oil revenues were high.¹¹ This overconsumption and underinvestment assumes that the good times will last forever, but history (and geology) tell us otherwise.

When spending increases too quickly, a bureaucracy will likely find it difficult to adjust, another factor that can lead to poorly conceived, designed and executed capital projects. How difficult the adjustment is will depend on the so-called “absorptive capacity” of the government and the economy. Absorptive capacity is a government’s ability to absorb additional spending efficiently and transform financial resources into concrete infrastructure and social services. It also encompasses the ability of the domestic private sector to provide the goods and services contracted by the government.

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10 See Serven, 1998; Perry, 2003; Ramey and Ramey, 1995; Fatas, 2002; Pallage and Robe, 2003.

11 World Bank statistics.

Among other things, absorptive capacity depends on the domestic supply of qualified labor, speed at which people can be trained, ease of access to inputs, ease of access to credit for businesses, and the presence of management systems and institutions that can cope with an increase in spending. With regard to the public sector, if a government can easily draw on a pool of trained engineers, administrators and other service providers, if management systems are in place to efficiently increase spending, and if there are adequate accountability mechanisms in place to prevent waste and corruption, then absorptive capacity is considered high. On the other hand, if there is a lack of qualified staff and governance systems are weak, then absorptive capacity is considered low and there is a good chance public funds will be wasted.

Similarly, the local economy can have high or low absorptive capacity. If there is adequate supply of capital (financing and equipment) and local labor to meet the demand generated by an inflow of resource revenues into the local economy, then local businesses will thrive and employment will increase. On the other hand, if local businesses cannot absorb these revenue inflows, inflation or entry of foreign contractors may result. If there is not enough skilled labor, then the inflow of money into the local economy may cause instability, as with a sudden influx of foreign workers.

The problem can be worse and spread to the private sector when government spending declines after a sudden drop in oil or mining revenues. When businesses grow and proliferate when government expenditures are high, they become particularly vulnerable to government spending cuts, since the government is often the only source of large contracts in resource-rich regions. In this way, government expenditure volatility can lead to bankruptcies in the wider economy.¹²

Figure 3 illustrates these medium-term “boom–bust” cycles in government spending. Between 1975 and 1990, the province of Alberta in Canada experienced three distinct boom–bust cycles. Alberta has the right to collect royalties directly or sign contracts with oil or mineral companies, which helps explain the significant rise in public spending when production and prices rose. However, this spending has often proven unsustainable. Today, for example, Alberta is facing a fiscal crisis despite benefiting from an oil boom over the last few years. The declining price of oil sands bitumen means Alberta expects to collect \$6 billion less in 2013 than in 2012, despite production remaining relatively constant. The government continues to deplete its Sustainability Fund to finance overspending, withdrawing another \$2.1 billion this year (the balance is down to \$691 million from \$17 billion in 2008), yet still expects a 2013 budget deficit of \$6.3 billion on revenues of \$38.6 billion.¹³

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12 Ricardo Hausmann and Roberto Rigobon “An alternative interpretation of the ‘resource curse’: Theory and policy implications,” <http://web.mit.edu/rigobon/www/RobertosWebPage/policyISfiles/is.pdf>

13 Karen Kleiss. “‘Painful cuts’, billions in borrowing in Alberta budget,” Edmonton Journal (March 8, 2013).

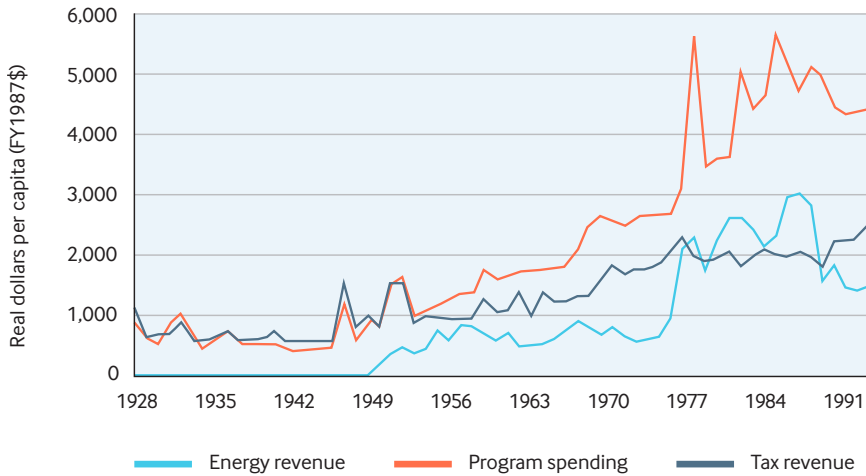


Figure 3. Long-Term Expenditure Volatility and Pro-Cyclical Fiscal Policy in Alberta (Canada) from 1928–1991

Source: Paul Boothe, "The Growth of Government Spending in Alberta, Canadian Tax Foundation, 1995

The problems associated with volatility can be exacerbated at the subnational level, where governments often rely on a single or at best a handful of production sites. Any disruption to production can have a significant impact on revenues, testing the government's ability to finance its projects and social programs. For example, oil-related violence in the Niger Delta led to a 20 percent drop in oil production, which had significant impact on Rivers State revenue.

Managing the long-term production cycle

Over the longer term (more than five years), resource-rich governments may face a fast rise in resource revenues in the early phases of production, followed by a steady decline over 20–50 years, depending on the oil/gas field or mine (see Figures 4 and 5 for typical petroleum and mineral revenue projections). In theory, as a field or mine begins to generate significant revenues—which may not be until several years into production—subnational governments behaving optimally would increase their expenditures at a slow, steady rate by spending what is needed and saving the remaining funds for future use. This is because increasing spending too quickly can lead to rising costs, poor quality investments or waste.¹⁴ Saving a portion of resource revenues can allow the bureaucracy time to plan and invest effectively in roads, schools, hospitals and other infrastructure projects and allows the private sector to build the capacity to implement these projects.

Most subnational governments do not save much, if any, revenues and tend to spend resource revenues as they go, either because they are not allowed or disincentivized to save, or because they do not have a medium-term fiscal framework in place. A steep rise in spending often leads to a focus on construction projects or increased household consumption, particularly in the early days of production. When production begins to decline, subnational jurisdictions often find themselves starved of cash, leading to government spending cuts. Countries or regions that have not planned in advance, such as the area near the town of Asbestos in Quebec (Canada) or whole sections of the Karas region in Namibia, have been left with idle infrastructure, undiversified economies, local recessions or even economic depressions once the resource has been depleted. The province of British Columbia in Canada has by some estimates more than 1,500 abandoned or semi-abandoned mining towns in the depressed north and interior.

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14 "Fiscal Policy Response to Scaled-up Aid" (Washington: IMF, 2007), <http://www.imf.org/external/np/pp/2007/eng/060507.pdf>

Sewell in Chile was home to 14,000 inhabitants before its copper mine closed. Today it is completely abandoned.

Perhaps the most famous case of poor planning and overconsumption is the island nation of Nauru. In the 1970s, Nauru experienced a massive economic expansion thanks to phosphate mining. By 1973, it had gone from one of the world’s poorest nations to one of its richest, with GDP peaking at \$178 million, or \$25,500 per citizen (in 2005 dollars). By 2007, it had once again dropped to one of the world’s poorest; GDP was less than \$19 million, or \$1,900 per citizen.¹⁵ The economy has not recovered.

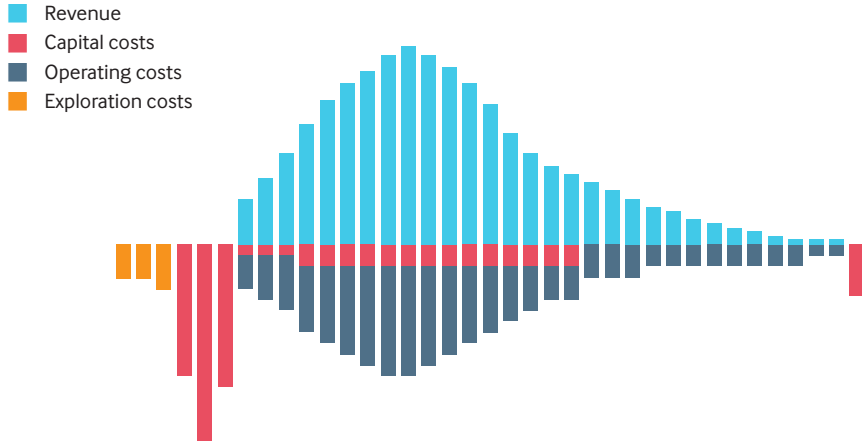


Figure 4. Illustrative project timeline for a typical oil and gas project¹⁶
Source: NRGi

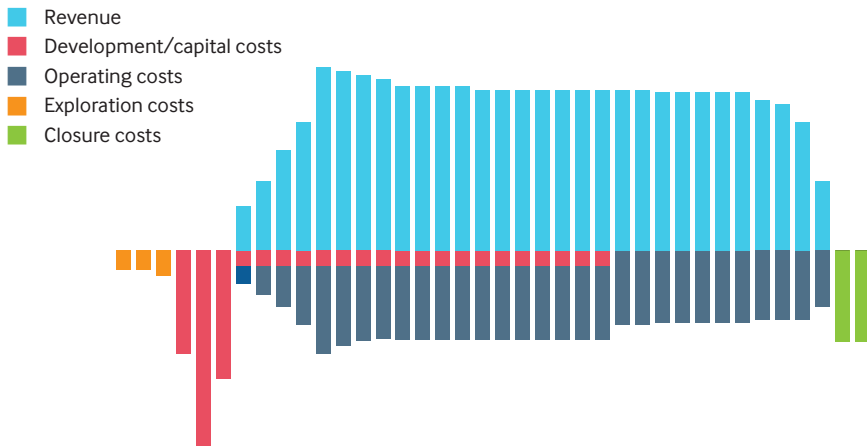


Figure 5. Illustrative project timeline for a typical mining project
Source: NRGi

15 Nick Squires, “Nauru seeks to regain lost fortune,” BBC (March 15, 2008), [http://news.bbc.co.uk/2/hi/programmes/ fromourown correspondent/7296832.stm](http://news.bbc.co.uk/2/hi/programmes/fromourown correspondent/7296832.stm). Helen Fraser and Minh Nguyen “View on Nauru: Between a mined-out rock and a hard place,” Uniya, [http://www.uniya.org/research/ viewnauru.pdf](http://www.uniya.org/research/viewnauru.pdf). “GDP by Type of Expenditure at constant (2005) prices - US dollars,” United Nations, [http://data.un.org/ Data.aspx?d=SNAAMA&f=grID%3a102%3bcurreID%3aUSD%3bpcFlag%3a0](http://data.un.org/Data.aspx?d=SNAAMA&f=grID%3a102%3bcurreID%3aUSD%3bpcFlag%3a0)

16 Revenue is income (price times production). A capital cost is a fixed, one-time purchase of land or equipment. An operating cost is an expense related to day-to-day production, such as worker wages. Exploration costs are the expenses incurred while trying to find ore or crude oil, such as drilling a well. Early in the life cycle of an oil field or mine—during the exploration and development phase—a company incurs significant costs without generating revenue. Production generally ramps up quickly and then slowly peters out as pressure decreases in the oil field or the highest-quality ore is mined first. Finally, mines and oil fields have closure costs, expenses incurred from filling in an open pit or closing an oil well.

Improving the quality of public spending

Even in cases where subnational governments accurately forecast revenues, control short- to medium-term expenditure volatility and plan in advance, they may still face challenges turning resource revenues into productive investments. The reasons are many. First, annual budgets may not incorporate a multiyear development plan. In other words, there may be a disconnect between the long-term vision and annual expenditure decisions.

Second, governments may not choose the projects with the highest social rate of return and that address developmental bottlenecks in the local economy. For example, the government may choose to build a port for exporting goods when the largest market for locally produced goods can be reached by a less expensive road. Or it may spend on a conference center and concert hall when investing in health, education and clean water may generate larger social returns for more people, as in Azerbaijan.

Third, public contracts may not go to the most qualified and reasonably priced contractor. This can result in high costs and poor quality provision.

Fourth, the government might not monitor construction or implementation, also leading to poor service provision.

Finally, the government may not plan for the operations and maintenance of public investments, either by not budgeting for them or by not training local staff to operate and maintain them. In short, public investment management must be improved to transform resource revenues into quality public investments.

To help overcome these challenges, this paper makes three policy recommendations, which are discussed in the next section. Subnational governments in resource-rich areas may wish to:

- 1 smooth expenditures over the short to medium term by implementing a fiscal rule (which may require accurately forecasting resource revenues, and either ably managing public debt or saving a portion of revenues in a fund);
- 2 prepare a comprehensive development plan that promotes non-resource sector economic growth; and
- 3 invest in the public investment process.

REVENUE MANAGEMENT BY SUBNATIONAL GOVERNMENTS: POLICY OPTIONS

Smoothing expenditures using fiscal rules

Fiscal rules: De-linking expenditures from revenues and forecasting

Subnational governments have essentially four choices when faced with a revenue wind-fall: increase spending, decrease taxes, pay down public debt or save revenues. Similarly, when revenues decline unexpectedly, causing a fiscal deficit (expenditures exceeding revenues), governments can: cut spending, increase taxes, borrow from financial institutions, draw on public savings or ask the central government for financial aid.

Which option a government chooses depends not just on “good practice” but also on political and institutional constraints. After all, not all four options are available to every subnational government. For example, balanced-budget rules in the United States prevent most state governments from borrowing. In Indonesia, district governments

have a disincentive to save, since unspent money is “clawed back” from the central government transfer the following year. In Bolivia, Brazil, Columbia, Papua New Guinea and Peru, the law or the central government require earmarking resource revenue transfers to specific investment projects, thus limiting subnational government discretion in planning how such revenues might be spent. And in Bolivia, Nigeria and Peru, national governments have not lent to local governments to cover deficits, even in times of crisis.¹⁷

In section 1 of this paper, I discussed the challenges associated with resource revenue volatility—namely, poor investment decisions made by the public and private sectors. Since most subnational governments do not control revenue volatility via tax policy or through oil or mineral contracts, the main policy instrument to address these problems is delinking expenditures from revenues. As such, resource-rich governments may wish to “smooth” expenditures in the short, medium and long terms, instead of allowing them to rise and fall with revenues. For example, Botswana’s and Peru’s national governments have capped annual expenditure growth, regardless of revenues. Alternately, governments can limit the amount of revenue entering the budget. For instance, Trinidad and Tobago enacted a rule whereby a maximum of 40 percent of an 11-year average of mineral revenues can be spent in any given year; the remaining amount is deposited in a fund, with exceptions in cases of emergency (e.g., environmental catastrophe). This would smooth expenditures and allow greater spending in the early years of production, but might be more difficult to enforce. For instance, it might require an independent agency to make revenue projections to determine the 11-year average, which may be quite difficult to establish independently at the subnational level. All these limitations on spending are types of fiscal rules. Chile, Norway and Trinidad and Tobago are examples of countries that have enacted oil or mineral revenue-based fiscal rules at the national level; Wyoming and Texas have enacted rules at the subnational level.

Since most subnational governments do not control revenue volatility via tax policy or through oil or mineral contracts, the main policy instrument to address these problems is delinking expenditures from revenues.

Figure 6 illustrates an expenditure rule, which limits annual expenditure growth. The blue line represents volatile revenues. If there is no expenditure smoothing, expenditures equal revenues at all times. If there is expenditure smoothing, then revenues are still represented by the blue line, but expenditures are represented by the red line.

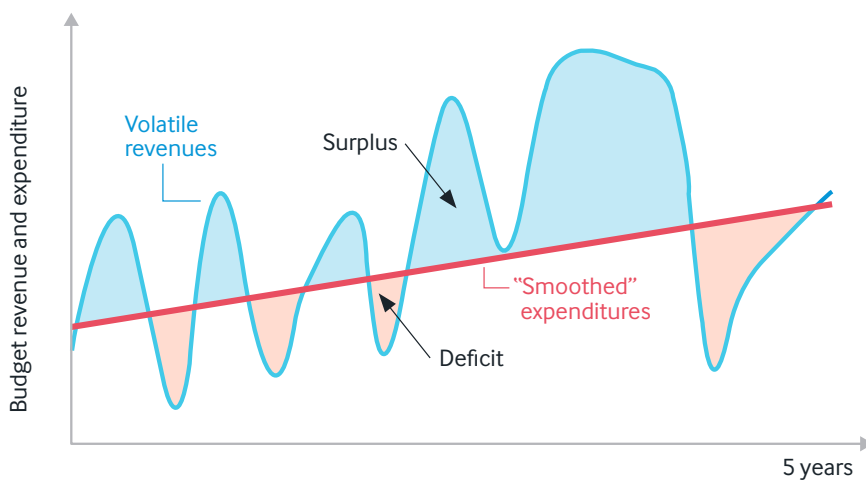


Figure 6. Medium-term expenditure smoothing

17 Gerald J. Miller and W. Bartley Hildreth, “Local Debt Management,” Local Public Financial Management (ed. Anwar Shah), (Washington: World Bank, 2007).

Importantly, some fiscal rules require rough revenue forecasts for 5, 7 or 11 years, or over the course of an oil field's or mine's life cycle. After all, how can a government decide how much to save or spend unless it knows how much revenue it expects to receive? In countries like Brazil, Colombia, Nigeria and Peru, forecasted revenues for subnational governments are provided by the national government. However, these figures are sometimes unreliable or not disaggregated by subnational jurisdiction or by oil, gas or mining project; hence, they are potentially unhelpful for budget planning. In other countries, forecasts by the national government are simply unavailable or inaccessible to subnational governments, as in Angola and the Philippines.

In countries with general intergovernmental transfer programs, subnational governments must have access to at least two sets of information to forecast revenues: (1) the size of the total pool of money to be transferred to all subnational jurisdictions and (2) the mechanism or formula used to allocate that money.¹⁸ Derivation-based transfer programs often treat producing, neighbouring and nonproducing jurisdictions differently. To calculate revenue shares, subnational governments must know the production volumes for oil, gas or minerals in each jurisdiction and may require the terms of contracts, production cost estimates, sales estimates, population figures or poverty indicators. Subnational authorities would also need to assume a future price for the oil, gas or minerals. While some jurisdictions make their price assumptions arbitrarily, it is becoming increasingly common to use a more objective figure, such as an average of past, present and estimated prices or an independent forecast (for example, from the International Energy Agency's World Energy Outlook).¹⁹

That said, the information necessary to forecast oil, gas or mineral revenues may be unavailable. Contracts are often secret, cost estimates are not disclosed by companies or the national government, and production volumes and sales figures are either opaque or unreliable. For instance, among the 58 resource-rich countries surveyed in the 2013 Resource Governance Index, only 10 published even some of their contracts. In these cases, greater transparency in the oil or mineral sector may be required—public disclosure of revenue information and transfer amounts from the national government to subnational governments, or instituting an advanced Extractive Industries Transparency Initiative process at the subnational level.

Among the 58 resource-rich countries surveyed in the 2013 Resource Governance Index, only 10 published even some of their contracts.

Smoothing expenditures in practice: using fiscal rules and funds

Figure 7 shows the response of two resource-rich subnational governments to volatile revenues. Bayelsa State is a major oil- and gas-producing area, responsible for more than 30 percent of Nigeria's oil production. As an oil-producing state, it has the right to a significant share of oil revenues, somewhere in the range of 5 percent of all Nigerian oil and gas revenues, which totalled more than \$59 billion in 2008.²⁰ Wyoming is an oil-, gas- and mineral-rich U.S. state with the right to set and collect its own natural resource taxes. In 2011 it produced 54 million barrels of crude and 2,143 trillion cubic feet of gas, generating \$2.4 billion in oil and gas revenue for the state and local governments.²¹ Wyoming is also a major coal, bentonite, trona and uranium producer; coal alone generated \$1.2 billion in revenue for state coffers in 2011.²²

18 Larry Schroeder, "Forecasting Local Revenues and Expenditures," Local Budgeting (ed. Anwar Shah), (Washington: World Bank, 2007), 63.

19 <http://www.worldenergyoutlook.org/>

20 "Nigeria," Extractive Industries Transparency Initiative, <http://eiti.org/node/78/reports>

21 "Wyoming Oil and Gas Facts and Figures," 2012 Edition, <http://www.pawyo.org/facts-figures.pdf>

22 "Wyoming Coal," Wyoming Mining Association, <http://www.wma-minelife.com/coal/coalhome.html>

While both governments are heavily reliant on natural resource revenues, their spending patterns could not be more different. Bayelsa’s spending has increased and decreased in correspondence with the rise and fall of oil prices. In 2007–08, when oil prices spiked, it chose to spend, increasing budget expenditures by nearly 13 percent in nominal terms. Health spending increased by about \$12.5 million, and government wages increased by nearly \$9 million. Curiously, education spending dropped by \$36 million despite the windfall.

One year later, oil prices took a sharp fall and Bayelsa was forced to cut its budget by 13 percent, below 2007 levels. In the face of these cuts, the government managed to increase the education budget by approximately \$11 million. However, it cut health spending by \$46 million. More shockingly, government wages continued to rise in this period of austerity. By 2011, government administration accounted for over 70 percent of the Bayelsa budget. Due to insufficient safeguards, much of this government payroll increase was disbursed to ghost workers.

Wyoming, on the other hand, has not increased spending over the same period, despite historically high oil and mineral prices. This is due to its self-imposed legislated limit on spending growth, called the Spending Policy Amount (SPA), a fiscal rule designed to reduce volatility and save natural resource revenues for future generations.

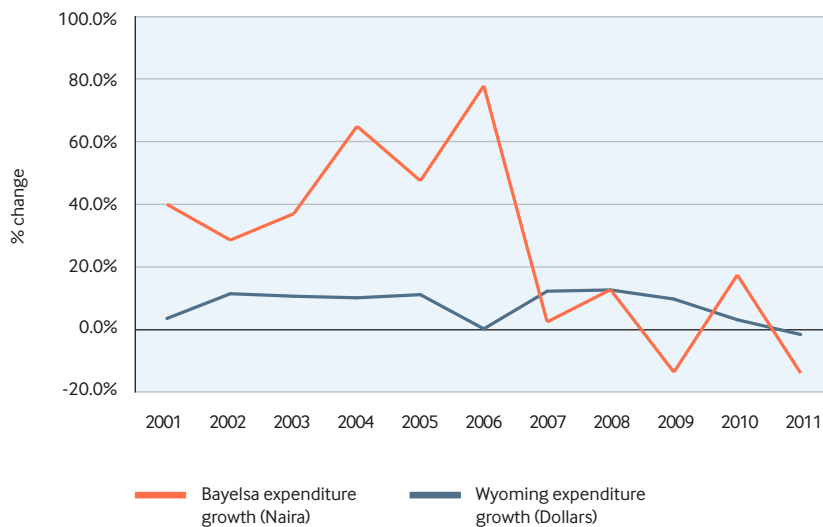


Figure 7. Short- to medium-term expenditure volatility in Bayelsa and Wyoming

Sources : Ekankumo and Henry (2011); Niger Delta Citizens and Budget Platform (2011); US Census Bureau (2013)

Like many other governments that have implemented a fiscal rule like the SPA, Wyoming had to decide what to do in years that yielded surplus revenue. Like a number of other U.S. states (Alabama, Alaska, Montana, North Dakota, Oklahoma and Texas) and a Canadian province (Alberta), it has chosen to establish a so-called natural resource fund to store oil, gas and mineral revenues. While some funds have been established to stabilize local revenues over the short to medium term (e.g., the Permanent Wyoming Mineral Trust Fund Reserve Account), others have been designed to ensure that future generations benefit from natural resources as much as present generations (e.g., the Texas Rainy Day Fund). For example, the SPA rule states that the Wyoming government is only allowed to spend 5 percent of a five-year running average of revenues saved in its Permanent Wyoming Mineral Trust Fund Reserve Account. How well they function depends on the specific rules governing the funds, their accountability and transparency requirements, and whether there is adequate oversight by the subnational legislature and civil society.

Many of these funds contain sub-funds to earmark resource revenues for specific purposes or to prevent them from being used to bankroll operational government spending. For example, the Montana Permanent Coal Tax Trust Fund contains a number of sub-funds, such as the Treasure State Endowment Fund (to finance infrastructure projects) and the Big Sky Economic Development Fund (to finance local economic development projects and certified regional development corporations). Annex 1 provides a guide on how to establish fiscal rules and ensure adequate oversight.

As mentioned earlier, governments are not the only entities that have enacted fiscal rules to save oil or mineral revenues. Some affected communities receive revenues directly from oil or mining companies, either as compensation for loss of livelihoods or environmental degradation, or to generate a social license to operate. In others, companies are legally obligated to pay revenues to local communities. Payments may be made to communities via local government authorities, town councils or traditional councils, or directly to households. For example, indigenous communities in the Philippines are entitled to a minimum 1 percent royalty on all extractive activities within their ancestral domains. In most of these cases, companies will sign a contract with the traditional council—sometimes called an Impact Benefit Agreement or a Memorandum of Agreement—outlining the payments to be made to community members.

As such, many communities face some of the same challenges as national or subnational governments: volatile, unpredictable revenues and overwhelming inflows of cash. In response, several have established trust funds financed by resource revenues. For example, the Raglan Trust in the Salluit (population 1,347) and Kangiqsujuaq (population 696) communities of northern Canada was established to distribute the communities' share of Raglan mine revenues. Xstrata, the mine's operator, deposited \$2 million in the fund as start-up cash, and now deposits between \$300,000 and \$1.1 million, plus 4.5 percent of annual profit, in the fund every year, to be shared between the territory of Nunavut (population 32,000) and the two communities based on a formula. In 2010, Xstrata deposited \$15.2 million. While Kangiqsujuaq has decided to distribute most of its share in cash to residents, Salluit has used the trust fund to save 40 percent of its revenues for future generations.

Similarly, the Gelganyem and Kikaya Trusts in Australia earmark some of the communities' approximately \$1 million yearly share of the Argyle diamond mine revenue for local economic development (e.g., employment and training programs) and a support program for teenage girls. The remaining amount is distributed in cash to community members or is being saved for when mining has ended.

In both the Canadian and Australian examples, the trust funds have strict rules about which revenues go into the funds, constraints on withdrawing money, who manages the funds and whom they are accountable to, as well as transparency requirements. These rules are crucial for ensuring that the funds are not mismanaged or misappropriated. Some countries, like Chad, Ghana and Timor-Leste, have legislated quasi-government or civil society oversight bodies with monitoring compliance with these rules to prevent fund mismanagement. The national government can also play this oversight role, either by ensuring compliance with rules or by managing the funds itself on behalf of subnational governments.

Smoothing expenditures in practice: Fiscal rules and managing public debt

Governments do not need to use a fund to smooth expenditures. Another option is to comply with a fiscal rule by ably managing public debt. When the fiscal rule generates a deficit, the government borrows; when the fiscal rule generates a surplus, the government pays down its debt.

Why would a subnational government choose this option over a fund? First, without proper rules, capable managers and adequate oversight, a fund may simply complicate the budget process and lead to mismanagement of public funds. Second, some subnational jurisdictions are disincentivized or not allowed by the national government to save and establish natural resource funds, because of self-imposed balanced-budget rules or “claw-back” provisions that allow the central government to retain unspent revenues. In jurisdictions like Bojonegoro (Indonesia) or Louisiana (United States), local governments have been driven to increase spending when oil prices have been high and to make drastic cuts when revenues have declined.

That said, there are challenges associated with smoothing expenditures through debt management. First, the most significant challenge many resource-rich jurisdictions face is managing the significant revenue windfall at the start of production. If the government does not have any debt at this time, it cannot smooth expenditures by paying down debt. Thus, unless the government can save these revenues in a fund or with the central government, it must spend everything it receives.

Second, oil-, gas- and mineral-rich jurisdictions with a large claim on resource revenues are in a simultaneously privileged and unenviable position. On the one hand, banks are likely to offer loans to resource-rich local governments at lower interest rates and on better terms than non-resource-rich governments receive. On the other hand, the temptation to finance government spending, especially large infrastructure projects, through low-cost borrowing can be irresistible. Since their access to cheap financing increases when they have greater sources of revenue, resource-rich jurisdictions have a tendency to borrow money even when oil, gas or mineral revenues are at all-time highs.

In the long run, over-borrowing can lead to debt crises. In some countries, subnational jurisdictions’ finances are implicitly guaranteed by the central government, to the point that the central government will bail them out in a crisis. Chile, Colombia, Indonesia, Mexico and Russia all bailed out local governments between 1982 and 2000. However, other national governments, like those in Bolivia, Nigeria and Peru, have either made policy decisions or have legal frameworks in place that have led to subnational government defaults.²³ Debt crises in these countries have often led to a severe contraction of local services, cuts in wages and social conflict.

Therefore, in addition to employing a fiscal rule to smooth expenditures, subnational governments that borrow may wish to limit their borrowing by employing a debt limit. For example, Texas (USA) legislated that it will borrow a maximum of 5 percent of government revenues over the previous three years; the remaining revenue must come from other sources. Wyoming (USA) limits debt service payments to 1 percent of the assessed value of taxable property.²⁴

In addition to employing a fiscal rule to smooth expenditures, subnational governments that borrow may wish to limit their borrowing by employing a debt limit.

23 Lili Liu and Michael Waibel, “Subnational Borrowing, Insolvency and Regulation,” *Macro Federalism and Local Finance* (ed. Anwar Shah), (Washington: World Bank, 2008).

24 Miller, Gerald J. and W. Bartley Hildret, “Local Debt Management,” *Local Public Financial Management* (ed. Anwar Shah), (Washington: World Bank, 2007).

A government could also limit the use of oil, gas or mineral revenues as collateral on public debt, thereby increasing the interest rate it has to pay and curbing its incentive to borrow (collateral is an asset a borrower offers a lender to secure a loan; if the borrower stops making the promised loan payments, the lender can seize the collateral to recoup its losses). For example, Timor-Leste only encumbers, and therefore only risks, 10 percent of oil and gas revenues in its petroleum fund.

Resource-rich subnational governments may also wish to work with their central government to find solutions that serve both national and local interests, such as allowing the subnational government to save natural resource revenues in boom times. This would offer subnational governments easy access to funds and control over their resources. Central governments may also save resource revenues on behalf of subnational governments. This may be preferable in countries where the central government has more administrative capacity and efficiency and where funds can be pooled to generate a higher return with lower overall risk. Finally, national and subnational governments can work together and with international experts to build capacity to spend resource revenues effectively.

Development planning in resource-rich regions

One means of improving spending outcomes is to plan ahead by creating a detailed, costed and comprehensive development plan (see Annex 1 for details). While development planning is important in any jurisdiction, it is especially important in resource-rich regions where oil or mining can generate massive revenues for 20 to 30 years or more and then disappear. As resources dry up, governments dependent on high revenues may find themselves forced to cut essential services or investments. Private businesses may also become dependent on the resource sector when revenues are high, leading to joblessness, bankruptcies and abandoned buildings when the sector vanishes.

While most subnational governments establish an annual “fiscal envelope” (the total amount of revenues and expenditures) through the budget process that may emanate from a fiscal rule, subnational governments should also have multiyear plans that include estimates of revenues and expenditures, how they will use extra unexpected money (“windfall revenues”) and how they will cover a deficit when spending exceeds revenues. Multiyear plans can help governments transition from a resource-focused economy to a robust diversified economy, provided they are designed to overcome development bottlenecks—such as lack of access to capital or low levels of education—and that the plan is faithfully implemented. Multiyear plans can also assist oil- or mineral-rich governments in dealing with revenue volatility by helping them think longer-term.

To develop a plan, government officials need to identify and agree on public projects to be funded by natural resource revenues. In many jurisdictions, such as in Filipino and Ugandan local districts, long-term development strategies have tended to be more akin to vision statements than anything concrete. Strategies need to include clear development goals, such as diversifying the economy, providing basic services to all residents, investing in health and education and compensating those burdened by resource extraction. These goals should be developed and agreed upon in consultation with the public and should inform concrete local development objectives (e.g., 100 percent access to clean water) that themselves draw on an analysis of development bottlenecks and what needs to be done to promote sustainable growth. Once objectives are agreed on, a government

Subnational governments should also have multiyear plans that include estimates of revenues and expenditures, how they will use extra unexpected money (“windfall revenues”) and how they will cover a deficit when spending exceeds revenues.

must determine specific projects and then prioritize and sequence construction and implementation. In short, medium-term plans should include:²⁵

- An analysis of the gaps between objectives and the current situation, and how to close those gaps
- Development objectives in the short, medium and long term
- A list of priority investments to close the gaps
- A land management plan
- A realistic timeline with concrete targets
- Roles and responsibilities of government officials, companies, interest groups and other stakeholders
- A strategy to build consensus on the development plan and independently review progress toward targets

(See annex 1 for details.)

These plans must be revised every few years to reflect changing circumstances, most likely at the end of each medium-term plan. Ultimately, they must align with annual budgets, even as they change. Such integration is essential for ensuring that long-term objectives are translated into budgeted activities. In some countries, a specialized government agency has been established to guarantee consistency between the medium-term development plan and the annual budget (e.g., China's National Development and Reform Commission, Malaysia's Economic Policy Unit).

25 Some useful toolkits and manuals for crafting a medium-term development plan are:

- ESMAP-World Bank-ICMM Community Development Toolkit (2005): <http://www.esmap.org/sites/esmap.org/files/4132007110851Esmapcommunitytoolkit.pdf>
- Ghana National Development Planning Division Guidelines (2010): <http://www.ndpc.gov.gh/GPRS/DIST%20GUIDE%202010-2013-17-11-09.pdf>
- World Bank Local Economic Development Strategies (2004): <http://www.worldbank.org/urban/local/toolkit/pages/home.htm>

Box 1: Medium-term expenditure framework

The medium-term expenditure framework is a budget process that links medium-term development planning to the annual budget. Its objective is to incentivize the government to allocate resources to programs and projects that promote development goals (e.g., 80 percent access to electricity within five years). An MTEF is also meant to address the problems associated with year-to-year expenditure programming—namely: reactive rather than proactive budgeting; shifting political priorities leading to inefficient spending choices; and allocating scarce public resources based on the influence of special interests or specific ministries.

First launched in Australia, adopted in more than two-thirds of all countries and now being adopted at the subnational level in some countries including Colombia, Pakistan and South Africa, a typical MTEF consists of six steps (see below). The advantages of MTEFs are that they promote fiscal discipline, help allocate scarce funds more efficiently among ministries and encourage government efficiency (World Bank 2010). On the other hand, where there is a lack of political will to implement an MTEF, where there is resistance from line ministries or if it is poorly implemented—say, because of a lack of capacity to perform strategic planning, costing and forecasting—the introduction of an MTEF can simply destabilize government bureaucracies.

The six stages of a comprehensive MTEF	
STAGE	CHARACTERISTICS
Development of Macroeconomic/Fiscal Framework	<ul style="list-style-type: none"> • Macroeconomic model that projects revenues and expenditure over the medium term (multiyear)
Development of Sectoral Programs	<ul style="list-style-type: none"> • Agreement on sector objectives, outputs and activities • Review and development of programs and subprograms • Program cost estimation
Development of Sectoral Expenditure Frameworks	<ul style="list-style-type: none"> • Analysis of inter- and intra-sectoral trade-offs • Consensus-building on strategic resource allocation
Definition of Sector Resource Allocations	<ul style="list-style-type: none"> • Setting medium-term sector budget ceilings (cabinet approval)
Preparation of Sectoral Budgets	<ul style="list-style-type: none"> • Medium-term sectoral programs based on budget ceilings
Final Political Approval	<ul style="list-style-type: none"> • Presentation of budget estimates to cabinet and parliament for approval

Medium-term expenditure frameworks, or MTEFs—which involve setting an overall fiscal envelope, reviewing the current and medium-term costs of existing programs on a department-by-department basis, and allocating revenues based on whether or not costs are fixed and whether a given department is achieving overall government policy objectives—can also help ensure consistency between development plans and annual budgets (see Box 1). These plans are updated annually; in other words, a five-year MTEF remains a five-year plan indefinitely.

Planning may also involve interjurisdiction cooperation, given that several subnational areas will often share natural resources. In Peru, several district governments cooperated to establish voluntary associations called Mancomunidades to coordinate projects. Joining forces allowed them to learn from each other’s experiences, attract funds for cross-border projects and share project costs.

Actively involving citizens in the development planning process helps manage expectations about the benefits of resource revenues and builds trust. High levels of transparency, public education and citizen participation are also necessary to reduce the potential for increased corruption that “windfall” revenues often generate.

Some projects will increase an area’s capacity to make use of revenues from resources extracted nearby. In these cases, it is especially important to think about participation, not only as a project-based planning exercise, but also as an approach to building

Actively involving citizens in the development planning process helps manage expectations about the benefits of resource revenues and builds trust.

local communication systems that can keep stakeholders involved in local decision making over the long term. Indeed, participation in such contexts should not be considered merely part of the planning process, but an ongoing activity that helps shape accountability between citizens and the government.

Investing in the investment process

“Absorptive capacity” as described in Section 1 can improve organically over time. After all, government bureaucracies and businesses learn by doing. However, governments can also take specific measures to improve the quality of public investments—specifically, capital investments like roads, electricity, water and sanitation systems, schools and hospitals. Establishing an efficient public financial management system with adequate safeguards against corruption is key to transforming resource revenues into tangible benefits (see Figure 8 for main steps).

First, governments can align the annual budget with a multiyear development plan using an MTEF. (See Box 1.) Alignment can help ensure that investment decisions are guided by medium- and long-term goals rather than short-term political pressure.

Second, once the project has been approved through the normal budget process, which should include general project costing, the government should undergo a thorough project appraisal, including cost-benefit analysis and technical review. This stage involves a social, economic and environmental impact assessment, identification of options (e.g., for a road: different routes, construction timing and technologies; for a hospital: whether it’s focused on primary or specialized care), feasibility analysis (e.g., personnel requirements, demand analysis), risk assessment and financial costing, including operations and maintenance costs. The project appraisal ensures that the design meets the project goals, is cost-effective and fits into local, national and transnational networks.²⁶

Third, once the design, location and timing have been approved, a competitive, public and transparent procurement process should follow. This encourages cost savings, timely delivery and high-quality execution. It also discourages collusion between contractors and government officials.²⁷

Fourth, project implementation should be monitored by the government. Having appropriate internal controls, such as government engineers on hand to ensure compliance with a building contract, can improve efficiency and encourage quality construction.²⁸

Fifth, projects should be evaluated by an independent external auditor. Evaluations can help correct mistakes and improve future project design and implementation.

Finally, operations and maintenance should be planned and provided. A common mistake governments make is constructing infrastructure, like a power plant or road, and failing to set aside funds for recurrent expenditures or training staff for operations and maintenance. Recurrent expenditures in the case of a new school serving an expanded student population would include teachers’ salaries and additional textbooks

26 “Guide to Cost-Benefit Analysis of Investment Projects,” European Commission, <http://ec.europa.eu/regionalpolicy/sources/docgener/guides/cost/guide2008en.pdf>

27 Era Dabla-Norris et al. “Investing in Public Investment: An Index of Public Investment Efficiency,” IMF Working Paper, <http://www.imf.org/external/pubs/ft/wp/2011/wp1137.pdf>

28 Era Dabla-Norris et al.

and teaching materials. They would also include electricity, heating and other costs required to operate the facility, and regular and periodic maintenance costs. Teachers would also need to be trained, along with administrators and those responsible for repairing the facilities.

The composition and cost of recurrent expenditures will vary considerably among sectors. For transportation, the main factor is maintenance, which could cost anywhere from 1 to 34 percent of the cost of construction annually to maintain, depending on whether the road is urban or rural, whether or not it is subject to flooding, and how well it is constructed. Inadequate road maintenance, for example, results in early reconstruction costs—at great additional expense. In the health and education sectors, the main factor is operations, which can cost up to 33 percent of the original investment cost annually. For irrigation projects, both operations and maintenance expenditures are important, costing 1 to 5 percent of the cost of construction annually.²⁹



Figure 8. Six steps to investing public revenues well

Each stage should incorporate formal and regular internal oversight—for example, through internal audits and establishment of compliance units within ministries. External oversight, supported by strong transparency requirements at each step, is equally necessary. Legislators, external auditors and civil society groups should have access to information on projected costs, project plans, project appraisals, contract tenders, monitoring reports and final audits, as well as progress reports. Timor-Leste’s Transparency and eProcurement Portals, for example, provide citizens with “unencumbered access to government budget and expenditure information and allow web users to interactively access and review open government tenders.” Oversight bodies can easily monitor the budget and bids to ensure public funds are being allocated and spent as expected. This can increase investor confidence and vendor participation, in addition to improving government effectiveness.

While these steps are necessary for improving public service provision by the government, some governments also choose to outsource some of these steps. For example, the government of Timor-Leste has outsourced major road contract tendering to the Asian Development Bank. It has also brought in foreign engineers on short-term contracts to do water and sanitation project appraisals and hired a private Italian company to monitor project execution on a large electricity project.

29 Ron Hood, David Husband and Fei Yu, “Recurrent Expenditure Requirements of Capital Projects: Estimation for Budget Purposes” (World Bank, 2002).

CONCLUSION

Resource-rich subnational governments that receive a share of oil, gas or mineral revenues often face four sets of budgetary and macroeconomic challenges: (1) budgeting when transfers from the central government are unpredictable; (2) managing short- to medium-term revenue volatility; (3) long-term planning for sustainable growth once all resources have been extracted; and (4) delivering on high-quality investments that unplug developmental bottlenecks, on time and at a reasonable cost.

To address the problem of volatility, subnational governments should avoid drastic changes in spending or taxes. Instead, they may wish to impose a fiscal rule that smooths expenditures from year to year. An effective fiscal rule that manages volatility would necessitate paying down debt in good times or borrowing in tough times or saving revenues in a fund in good times and drawing on that fund in tough times. Should a subnational government choose to establish a natural resource fund, it should pay special attention to enacting strong transparency and oversight requirements, so that fiscal rules are applied faithfully and to prevent mismanagement.

Over the longer term, subnational governments need to invest in infrastructure, social services like education and industries that will generate long-lasting and inclusive growth well after revenues have dried up. Development planning is a key element to achieving success. So is investing in the investment process.

Finally, national or subnational statutes sometimes disincentivize expenditure smoothing and a long-term development perspective. For example, they may set limits on public saving at the subnational level or provide inadequate oversight of subnational spending decisions. In these cases, subnational government officials, civil society and the national government may wish to work together to improve revenue management. First, they could ensure that subnational governments and the public are provided adequate information to forecast revenues, such as project-by-project payments, production volumes and contracts. Second, they could revise laws or regulations that prevent smoothing expenditures—for example, laws that require a balanced budget or prevent subnational governments from saving resource revenues.

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The Natural Resource Governance Institute, an independent, non-profit organization, helps people to realize the benefits of their countries' oil, gas and mineral wealth through applied research, and innovative approaches to capacity development, technical advice and advocacy.
Learn more at www.resourcegovernance.org

ANNEX 1: DEVELOPMENT PLANNING AND ESTABLISHING FISCAL RULES FOR RESOURCE-RICH SUBNATIONAL GOVERNMENTS

Addressing the challenges likely to arise from resource extraction and the resulting revenues requires long-term, medium-term and annual planning. The following section presents a step-by-step checklist for establishing fiscal rules and creating a development plan, should they be in the best interest of the region. This section does not propose specific rules, nor is it comprehensive.

Smoothing expenditures through fiscal rules

Preparation	<p>Research</p> <ul style="list-style-type: none"> • Generate medium- and long-term projections of oil, gas or mineral revenues over the next 30 years; this might require contracts, information on tax regime, intergovernmental transfer formula, production figures, price assumptions and costs of production • Estimate development plan costs over 30 years and assess government capacity to deliver • Assess public debt sustainability • Assess need for precautionary savings in the event of environmental, social or economic crisis
Development of fiscal rules	<p>Objectives</p> <p>Determine objectives of fiscal rules. For example:</p> <ul style="list-style-type: none"> • Stabilize revenues entering the budget to reduce short- and medium-term volatility • Save resource revenues and invest them for the benefit of future generations • Use resource revenue to pay down government debt • Safeguard resource revenues from being used as collateral on public debt • Earmark resource revenues for specific purposes like infrastructure, environmental protection, agricultural promotion, health or education • Ensure a high degree of transparency and oversight of resource revenues <p>Decide on fiscal rules</p> <p>Use research and objectives to legislate fiscal and management rules. For example, decide on:</p> <ul style="list-style-type: none"> • A deposit rule, such as royalties, bonuses, surface fees, corporate taxes, development and exploration fees from all oil and mining companies are deposited in the fund) • A withdrawal rule and price assumptions. For example, savings funds should only allow withdrawal once oil or minerals have been depleted or revenues start declining; stabilization funds should accumulate revenues when revenues are high and decrease when revenues are low; the government should legislate a standard oil or mineral price to calculate future revenues to determine what are “high” and “low” revenues. • An investment rule. Legislation may include the minimum percentage of the fund that must be invested in low-risk assets like investment-grade sovereign debt and maximum percentage of the fund that can be invested in higher-risk assets. Standards should also establish the maximum percentage of the fund that can be managed by a single manager, independence of financial managers and advisers, and qualifications of financial managers and advisers. • A collateral rule. Encumbering the fund can lower government debt interest rates, but may put the government’s savings at risk and encourage over-borrowing. The government may wish to legislate limits on fund encumbrances. • Management and accountability. Legislation should include details on which body or government department will operate the fund and whom fund operators are accountable to. • Oversight mechanisms. Legislation could clarify what operations the local legislative body must oversee, such as approval of financial statements. Also, a multistakeholder oversight committee could be established to ensure rules are followed and to oversee oil or mineral revenue management. • Reporting requirements. The fund should undergo an annual independent audit based on international standards, and the audit results should be made public. Also, the legislature or an independent oversight body could submit a public report on oil or mineral revenue management annually. • Penalties for noncompliance. Legislation should clarify penalties, including fines or prison sentences, in cases of noncompliance.

Implementation of fiscal rules	<ul style="list-style-type: none"> • Establish any funds required by fiscal rules • Hire or transfer government officials to manage or oversee investments, forecast future cash flow and track money flowing in and out of the fund(s) • Produce financial statements and reports • Fully fund activities of oversight bodies
Monitoring	<ul style="list-style-type: none"> • Release quarterly statements on financial activities of funds • Oversight body (or bodies) produce an annual report on activities of the fund and adherence to rules and advocate improvements in performance, if necessary • Government responds to monitoring reports, including potentially through policy adjustments • Disseminate reports and statements via media and other public disclosure mechanisms (e.g. websites, radio, community meetings)

Medium- to long-term development planning (typically focuses on 5–25 years)

Preparation	<p>Research</p> <ul style="list-style-type: none"> • Develop regional profile. May include an assessment of current levels of education and health levels, environmental challenges, the social safety net, transportation networks, water and sanitation, energy sources, agriculture, manufacturing activities, local justice and law enforcement, and government capacity. • Determine projected revenue and impacts. Should cover extractive activity, revenues and associated economic activity over the life cycle of the mine or oil/gas field and the likely scale of volatility, over the medium and long term. This may necessitate contracts, knowledge of the tax regime, revenue-sharing formula, costs of development and production, final production estimates and price assumptions. Should also include likely social and environmental challenges arising from extraction. • Prepare for public consultations. Identification of key groups that should be involved in participatory planning (e.g., public sector officials, communities affected by extraction, extractive company representatives, local entrepreneurs, local leaders, national government officials) and best venues and format of meetings and public consultations
Formulating the development plan	<ul style="list-style-type: none"> • Public consultations. Host consultations with key stakeholders on how resource revenues should be managed and spent • Drafting the development plan. The plan should include: <ul style="list-style-type: none"> ◦ Clear short-, medium- and long-term objectives and quantifiable targets ◦ Medium-term budget framework, including fiscal rules and mechanisms for managing and distributing resource revenues (e.g., savings rule, stabilization fund) ◦ Opportunities for sustainable development beyond extraction, including possible growth industries ◦ Constraints facing local businesses and how they will be overcome ◦ Minimum five-year fully costed budget for major expenditure items to be paid through resource revenues, broken down by year, to be reviewed regularly ◦ Maintenance and operations cost estimates for all new infrastructure, and plans to ensure maintenance and operations ◦ Policies to support sustainable growth of local non-extractive businesses and clear time frame for implementation ◦ Land use and environmental management plan, especially for areas affected by extraction ◦ Monitoring and evaluation framework for the development plan
Monitoring and oversight of the plan	<ul style="list-style-type: none"> • Publish key budget data including revenue assumptions, budget execution and performance information, and evaluations of adherence to the development plan • Disseminate information to citizens, government and companies through appropriate media (e.g., government website, radio, community meetings) • Monitor progress toward long-term priority objectives approximately every three to five years; involve representatives of the same key groups that were involved in the initial planning in the progressive monitoring and updating of the plan
Incorporation of the plan into the annual budget	<ul style="list-style-type: none"> • Establish or designate a government department or agency to coordinate the long- or medium-term development plan with the annual budget • Align the development plan with the annual budget during annual budget preparations • Ensure an independent body (e.g., legislature, multistakeholder group) publicly reports on adherence to the development plan and budget alignment with the plan

ANNEX 2: SUMMARY OF TAXATION AUTHORITY FOR SELECTED TAXES AND FEES (2000)³⁰

Country	Corporate Income tax			Mineral royalty			Dividend withholding tax			Excise/sales tax on equip & services			VAT on imported equipment			Property tax			Fee based on land area			Stamp tax		
	N	P	L	N	P	L	N	P	L	N	P	L	N	P	L	N	P	L	N	P	L	N	P	L
Argentina	X				X		X				X		X									X		
Bolivia	X				X		X						X						1	1				
Burkina Faso	X			X			X						X						X				X	
Canada (Ont.)	X	X					X						X											
Chile	X						X			X			X			X			X			X		
China	X	X		X														X				X		
Ghana	X			X			X			X			X					X				X		
Greenland	X						X															X		
Indonesia (2)	X			X			X						X			3								
Ivory Coast	X			X			X						X			X			X			X		
Kazakhstan	X			X			X						X				X				X			
Mexico	X						X						X			4	4	4	4	4	4			
Papua N.G. (5)	X			X			X			X	X				X			X				X		
Peru	X						X						X					X						
Philippines	X			X		6	X						X				X				X	X		
Poland	X			7		7	X								X			X						
South Africa	X			8			X			X			X											
Sweden	X												X			X			X			X		
Tanzania	X			X			X										X	X				X		
USA	X	X		9	9		X				X	X					X							
Uzbekistan	X			X			X						X				X				X			
West. Australia	X				X		X			X			X			X			X			X		
Zimbabwe	X						X						X					X				X		

Notes: where an X is given, the tax exists although a project may sometimes be exempted; where there is a blank the tax does not apply to a typical mine; where a number is given, refer to the attached note with that number. Source: derived from data reported in J. Otto et al (2000), Global Mining Taxation Comparative Study, Golden: Colorado School of Mines

30 James M. Otto, "Fiscal Decentralization and Mining Taxation," World Bank Group Mining Department, <http://dev.revenuewatch.org/rwiresources/sites/default/files/Otto - Fiscal Decentralization and Mining Taxation.pdf>

ANNEX 3: FURTHER READING ON OIL, GAS AND MINERAL REVENUE SHARING AND INTERGOVERNMENTAL TRANSFERS

Ahmad, Ehtisham and Eric Mottu (2003) “Oil Revenue Assignment: Country Experiences and Issues” in *Fiscal Policy Formulation and Implementation in Oil-Producing Countries* (eds. J.M. Davis, R. Ossowski and A. Fedelino). IMF: Washington DC.

Brosio, Giorgio (2003) “Oil Revenue and Fiscal Federalism” in *Fiscal Policy Formulation and Implementation in Oil-Producing Countries* (eds. J.M. Davis, R. Ossowski and A. Fedelino). IMF: Washington DC.

Ma, Jun (1997) *Intergovernmental Fiscal Transfers in Nine Countries*. World Bank Policy Research Working Paper 1822. Online: <http://www1.worldbank.org/publicsector/LearningProgram/Decentralization/ITFNineCountries.pdf>

Morgandi, Matteo (2008) *Extractive Industries Revenues Distribution at the Sub-National Level*. Revenue Watch Institute. Online: <http://www.revenuewatch.org/publications/extractive-industries-revenues-distribution-subnational-level>.

Shah, Anwar and Robin Boadway (eds.) (2007) *Intergovernmental Fiscal Transfers: Principles and Practice*. World Bank: Washington DC.