

Intergovernmental Fiscal Management in Natural Resource–Rich Settings

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Intergovernmental Fiscal Management in Natural Resource–Rich Settings¹

1. In resource-dependent countries, natural resources constitute one of the main assets available for financing local governments because the economy is not greatly diversified. The goal of this note is to highlight different critical dimensions of intergovernmental fiscal relations in these settings, present a survey of the range of arrangements used for managing resource rents across multiple levels of government, and synthesize basic principles or considerations in the implementation of revenue-sharing systems across different contexts.
2. The design and implementation of measures to improve intergovernmental management of the oil, gas, and mining sector must consider the core policy objectives, fiscal context, and overall political structure. Paying attention to the constraints and political economy drivers that shape intergovernmental relations is critical to identify the feasible reforms and alternatives to improve performance that are available in a given country.

I. Special Features of Non-Renewable Resources and Policy Issues

3. The inherently complex design of intergovernmental fiscal systems becomes even more challenging in the extractive sector owing to the distinctive technical and economic characteristics of oil, gas, and mining, and the interactions between these and institutional and political factors. The first characteristic is *exhaustibility*. There is a finite amount of these resources in the ground since they are formed by extended geological processes and cannot be easily replenished. The extraction of a resource in the present time reduces the amount of the ore body or field available in the future and as a result there is an associated cost, known as user cost. This exhaustibility introduces issues of inter-generational equity and optimality of the extraction profile as well.
4. At the same time, extractive industries demand *long term planning* for both government and companies. Exploiting mineral resources requires *high frontloading of investments*, which

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are irreversible and highly specific to the industry. Significant exploration expenditures and risks precede startup, exploration expenses occur long before taxable income is available or even before a decision to mine or extract oil is made. It is also characterized by *high economic and technological complexity* and economic and geological risks for investors and governments that cannot be fully foreseen during the time contracts are being negotiated.

5. Notably, *commodity prices often highly volatile*. Producers are price takers and react to changes in international prices. The more progressive a country's fiscal regime is, the more vulnerable it is to price changes. On the other hand, progressivity allows the government to capture windfalls profits during boom periods. It is not uncommon that high prices trigger revisions of fiscal terms if they are regressive, which undermines the country's credibility and the long term prospects for the sector. Depending on the overall soundness of macro-economic management (and whether spending is smoothed or not) and the design of the intergovernmental fiscal system this volatility could be directly to subnational governments with significant implications for their ability to plan and finance service delivery.

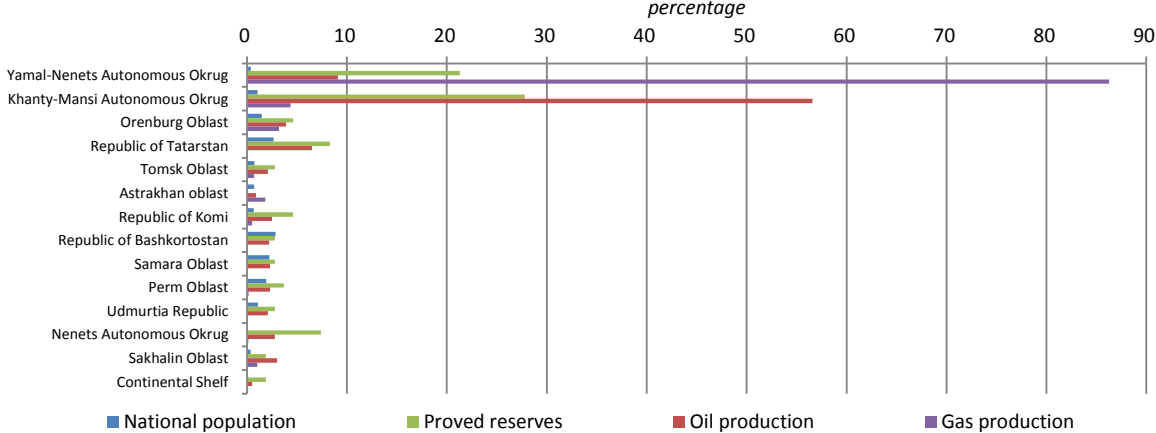
6. At the same time, there is a large *diversity of mineral types* (oil, sand, coal, base metals, gold, and diamonds) with *diverse scales of operations and potential value added*. Intergovernmental fiscal systems have to grapple with a multitude of revenue sources and variation in their volume and location.

7. Important differences exist between the mining and petroleum sectors. The life cycle of a mining project is considerably longer than projects in the petroleum sector. On the other hand, oil production generally generates higher greater rents than mining. Extraction costs per barrel may vary significant, however, depending on the prevailing geology and transport costs to market. Oil production tends to be more enclaved than mining. The footprint of mineral extraction in local communities is much more visible as mining tends to generate more environmental and social externalities, but it also has more positive spillovers in the local economy (Otto 2001).

8. Mineral and oil resources are generally concentrated in a small number of subnational units. In many countries producing regions are sparsely populated. For example, the autonomous okrugs of Yamal-Nenets and Khanty-Mansi account for 90 percent of the gas production and 65

of oil production in the Russia Federation, but have less than 2 percent of the national population (see Figure 1). Similar instances can be found in numerous countries. In other cases, most of the production takes place off-shore, but on the coast of few states or municipalities, such as in the case of Brazil.

Figure 1: Major Oil and Gas Producing Regions in Russian Federation (2007)



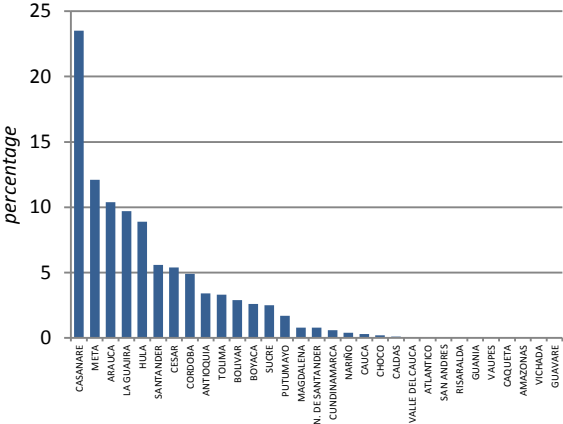
Source: Kurlyandskayai et al. 2012.

9. Such asymmetric distribution introduces concerns around horizontal equity and economic efficiency, in particular whether to earmark resource revenues and expenditures to the areas of production and what are the potential distortions introduced by such rules. In countries where a portion of royalties are earmarked to the producing regions, these tend to be concentrated in a small number of localities. In Colombia, until a recent reform, 48 percent of the royalties went to the producing departments and 13 to producing municipalities. In practice, this rule meant that two thirds of royalty revenues went to 5 (out of 32) departments (see Figure 2). To date, there has been practically no correlation between the amount of royalties received and departmental performance in reducing poverty or providing public services, despite the fact that some departments received several times the national average of transfers (World Bank 2011).

10. New finds and increases in production or prices can also exacerbate horizontal imbalances, unless there are considered within the overall intergovernmental transfer system and combined with other tools to equalize transfers. In Peru, where 20 percent of mining taxes are distributed to producing regions and 30 percent to local governments, the increase in prices in the

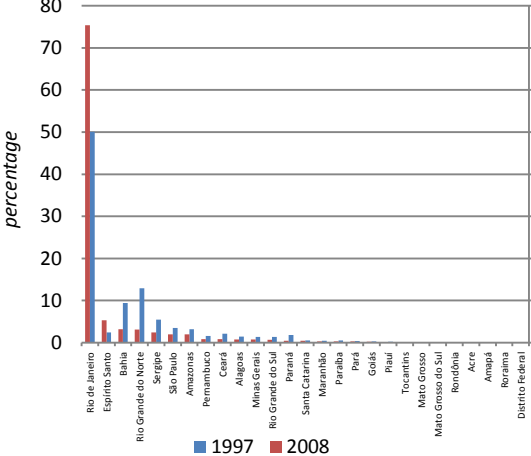
second part of the 2000s coupled with rising production volumes meant that producing localities received significant windfalls, in many cases well beyond their absorptive capacity. In Brazil, new discoveries off of the coast of Rio de Janeiro has meant that state went from receiving half of royalties in 1997 to over 75 percent a decade later (see Figure 3). During the same period, the amount that was distributed to states and municipalities increased from 150 US\$ million to 7 US\$ billion, which meant that Rio de Janeiro’s share grew from 75 US\$ million to 5.6 US\$ billion. In Colombia, royalty payments almost triple (going from 1.8 COP trillion in 2000 to 5.2 COP trillion in 2009).

Figure 2: Distribution of royalties by department in Colombia (percent), 2008.



Source: World Bank 2011.

Figure 3: Distribution of oil revenues by region in Brazil (percent), 1997 and 2008.



Source: ANP, Gobetti et al. 2012.

11. These features of natural resource revenues need to be considered when assessing the potential benefits and costs of the various intergovernmental fiscal arrangements.

II. Revenue Sharing Instruments

12. Countries generally use a mix fiscal and nonfiscal instruments to mobilize revenues from extractive industries, each with its own benefits and disadvantages along economic, administrative, and revenue-enhancing dimensions.² Nonfiscal alternatives include auctioning

² For a more extensive discussion see Barma et al. 2012 (chapter 4) and Le and Viñuela 2012.

exploration and extraction rights, production sharing, and equity participation. Fiscal instruments comprise royalty (specific and ad valorem), corporate income tax, presumptive income tax, resource rent tax, and property tax, as well as other taxes such as value added tax, and import and export duties (Otto and Andrews 2006, Sunley et al. 2003).

13. In turn, petroleum and mineral revenues can be shared vertically across levels of government using a variety of arrangements, which are summarized in Table 1. Nonfiscal options imply sharing part of the resources and revenues received as part of production sharing agreements or equity participation. They can also include in-kind revenue such as capital assets received as part of resource-for-infrastructure deals (Foster 2009). Fiscal arrangements range from separation of tax bases to intergovernmental transfers (Brosio 2006).

Table 1: Instruments for sharing rents from natural resources

Method	Separation of Tax Bases (own-source taxes)	Concurrence of Taxes (sharing of tax bases)	Sharing of Revenue	Sharing of Revenue In-Kind	Intergovernmental Transfers out of Revenue from Natural Resources
Determination of the tax base	Subnational	National	National	Mostly National	National
Determination of the tax rates	Subnational	Subnational (within limits)	National	Mostly national	National
Administration	Subnational	Mostly national	National	By the producing firm	Mostly national
Criterion for beneficiary jurisdiction	Origin	Origin	Origin	Origin	Need, equity, or other

Source: Brosio 2006, p. 441.

14. Whereas most alternatives allocate revenues according to the principle of origin, each of these distributes authority over the tax base, rate, and administration in a different manner. In the case of the separated tax base system, national and subnational governments are entitled to levy separate taxes on mineral production using different instruments (e.g. the national government collecting income tax and state government collecting royalties). The national and subnational governments separately administer their own instruments. In a tax-base-sharing arrangement, two or more levels of governments could tax the same base using the same instrument with the same or different rates (e.g. each level collecting different royalties). Tax

revenue sharing normally implies that tax bases, rates and the percentage accrued to producing regions are determined by the central government.

15. The complexity and administrative costs associated with the various tax instruments limit the options available for subnational governments in the cases where the tax base is shared. Resource rent taxes, which are more progressive, impose considerable administrative costs and require greater technical capacity (Brosio 2006). As a result, state and provincial governments generally prefer to directly levy royalties (Otto 2001) because that system not only is simpler but also reduces delays and variability in revenues (McLure 2003). Levying royalties at both levels of governments, however, potentially can lead to vertical externalities by increasing the overall burden of the tax.

16. Intergovernmental transfers, which are a grant from the central government that raised the funds to lower tiers of government, can vertically channel resources on the basis of origin or using other criteria such as equity. In most cases, transfers systems combine grants which have equalizing objectives with those that separately compensate producing regions. For example, Nigeria distributes the funds in the Federation Account (which is almost entirely financed by oil receipts) dividing 40 percent equally among all states, and the rest according to population, land mass and terrain, social needs, and internal revenue efforts. However, oil producing states receive an additional 13 percent of oil revenues generated in their territory.

III. Fiscal Principles on Natural Resource Management

17. The general literature on intergovernmental fiscal relations and decentralization recommends that a function is assigned to the level of government that would be able to conduct it with the greatest possible efficiency. If the functions require adapting to different needs, local governments would be in a better position to elicit information from citizens and deliver the mix of policies that better adapt to their preferences and economic conditions (Oates 1972). Conversely, functions and policy areas in which there are clear economies of scale or spillovers would be better served by the central government. Yet even in the areas where responsibilities have been devolved to lower tiers of governments, central governments retain significant roles in setting standards, regulation, and financing.

18. This normative literature is largely concerned with the potential efficiency and equity gains of decentralization. If properly implemented, devolution should allow local governments to choose different tax-expenditure mixes that best accommodate to heterogeneous local preferences and circumstances (Brennan and Buchanan 1965) and it should lead to gains in efficiency through local informational advantages, increased accountability, and competition and experimentation among local governments (Oates 1972).

19. Students of decentralization are also preoccupied with addressing vertical and horizontal fiscal imbalances arising from the gap between the distribution of functions and revenues (Schroeder 2001, Shah 2007). Central governments are generally more efficient at collecting taxes than subnational governments. As a result, the more decentralized functions are in a given country the greater the fiscal gap would be. If some revenue collection responsibilities are transferred to the lower levels, the gap could be smaller. But the gap ultimately depends on how effective tax administration is at the subnational level and the size of the revenue base that exist at that level. Whatever the case may be, transfers are likely to be an important part of subnational revenues in all countries.

20. Transfers and revenue sharing systems could be designed to solve these gaps and counteract some of the negative incentives associated with transfer. At the same time, transfers to subnational governments can be used to compensate for differences in needs and fiscal capacity by redistributing resources across jurisdictions.

21. Following this logic, literature on the assignment of revenue from natural resources recommends that subsoil natural resources are managed at the national level. Federal or central governments are better placed to collect revenues from extractive industries, which are complex and difficult to implement. Assigning tax collection to a single level of government has the additional benefit of preventing vertical externalities and overtaxation of the sector (Brosio 2006). A central system of natural resource rent collection also introduces efficiency by reducing administration and compliance costs and by allowing ring-fencing of projects across jurisdictions (McLure 2003; Mieszkowski 1983).

22. Revenue sharing or transfers are preferred over the assignment of own-source taxes to subnational governments and sharing tax bases (Boadway and Shah 1994; McLure 1983). As a

result of the uneven geographic distribution of natural resources and population, assigning rents exclusively to the state or regional level could lead to considerable horizontal imbalances, and even have political and economic destabilizing effects. In addition, there is uncertainty over the amount and location of resources and where future resources may be found, so it is in the interests of subnational governments to allow for some redistribution.

23. A key concern is not just the amount but the predictability of fiscal transfers that subnational governments receive. It is likely that subnational governments are less well placed than national governments to cope with significant revenue volatility. Resource revenues are subject to volatility arising from these sources, including variable rates of extraction over time, payments from producing companies, and prices. Subnational governments need some degree of medium-term revenue predictability in support of sound budgeting and execution. If subnationals depend on central transfers, they likely will be quite vulnerable to adjustments by the central government. Even if transfers are based on rules-based criteria, transfers based on resource revenues can be subject to significant volatility (for example, due to price fluctuations, a fixed royalty share for subnationals may vary significantly).

24. The theory of federalism offers economic arguments to guide decisions on the amount of resources to be distributed to subnational governments and how they should be allocated across localities. First, subnational governments should be refunded for the additional costs and investments on local infrastructure that exploiting nonrenewables require before the rents are distributed (Bahl and Tumennasan 2004). Because resources tend to be concentrated in few subnational jurisdictions, such excess cost is imposed unevenly and would be frontloaded to a large extent.

25. Second, negative environmental externalities associated with the exploration and exploitation of mineral resources should be internalized in taxes and fees and be used to compensate the producing subnational units that bear these (Ahmad and Mottu 2002, Brosio 2006). Similarly, there may be compelling grounds to compensate regions with extractive industries for additional costs incurred to provide additional services for in-migrants associated with the industry, in the absence of the ability to raise these revenues directly (Bahl and

Tumennasan 2004; McLure 1983). This requires some measure of what these costs are, and if resource revenues are earmarked for these purposes.

26. However, there are other arguments made in favor giving additional revenue allocations to the originating regions on the basis of heritage. If a country's constitution has given regions ownership rights to subnational governments, these should be compensated for the user cost. Ideally the funds collected from the extraction of a mineral would be reinvested in capital goods that can replace the depleted natural wealth (Hartwick 1977) or preserved for future generations. The underlying rationality is that nonrenewable are part of a country's assets, and thus, consumption of revenues resulting from sales should more accurately be classified as consumption of capital instead of consumption of income (Dabán and Héris 2009; Humphreys, Sachs, and Stiglitz 2007).

27. Nevertheless, if all or a large portion of resource rents are earmarked to region of origin, the central government and nonproducing localities might not have adequate revenues to fulfill their functions, while producing regions are able to provide more public services and investment than the rest of the country. In this case, there will not only be vertical and horizontal disparities, but also inefficiencies given that the social return rate of investment would likely be lower in resource-rich but sparsely populated regions than in other jurisdictions (McLure 2003).

IV. International Experience

28. In practice, the degree and nature of the participation of subnational governments in the management of subsoil resources depends on how ownership, regulation and expenditure responsibilities have been distributed across levels of governments. This distribution of functions is the result of a complex process of institutional development and political bargains that do not necessarily focus on equity or efficiency of public expenditures.

29. There is a significant diversity in how countries have addressed the extractive sector in their intergovernmental fiscal system. Table 2 provides a stylized overview of intergovernmental management across resource-dependent settings. Countries are classified by the extent of vertical claims over subsoil assets (rows) as well as if ownership is vested in the national or

provincial/state government (columns). It is important to note that countries could be further classified along a number of other dimensions.

Table 2: Tax Assignment Instruments and Ownership of Sub-soil Resources

Tax Assignment	Ownership	
	National Ownership	Subnational Ownership
National budget/full centralization	Angola Algeria Azerbaijan Bahrain Chile Iran, Islamic Rep. of Kuwait Libya	Norway Oman Qatar Saudi Arabia Timor-Leste United Kingdom Yemen, Rep. of
Downward revenue sharing	Ecuador Ghana Indonesia Kazakhstan Mexico Malaysia Papua New Guinea	Peru Brazil Colombia Iraq Nigeria Venezuela, R. B. de
Concurrence of taxes (sharing of tax bases)	Russian Federation ^a	Argentina ^b Australia ^c India ^d Canada ^e United States ^f
Upward Revenue-sharing Arrangement		United Arab Emirates

Source: Author.

Note: a. Joint ownership of onshore resources between the Russian Federation and subnational entities. The continental shelf is owned exclusively by the Russian Federation.

b. Provinces own subsoil resources and control exploration licenses and exploitation concessions.

c. States have ownership and control of resources onshore and the federal rules apply to coastal waters and territorial sea.

d. States own resources onshore, but the federal government regulates and controls exploration licenses and exploitation concessions.

e. Provinces own and manage onshore resources. The federal government owns offshore resources and shares control and revenues with coastal provinces.

f. States own and regulate subsoil resource management, except in federal land and offshore.

30. In the majority of countries ownership of natural resources and related revenues are vested in the central government. Yet in a number of federal settings—including Argentina, Australia, Canada, India, the United States and the United Arab Emirates—state or provincial governments have rights over subsoil assets. In most cases, the federal government retains rights over offshore assets and those found in federal land. There is also a larger set of countries where subnational governments receive a share of revenues and royalties from extractive activities carried out within their geographical area.

31. A wide range of disparity exists in the extent to which revenues are spread across levels and in the overall degree fiscal and administrative decentralization. There is no strict correspondence between the form of government, either federal or unitary, and the more or less decentralizing character of revenue-sharing systems. However, only in federal countries do subnational units have ownership of nonrenewable resources.

32. Numerous countries use derivation-based revenue sharing with producing subnational units. For example, in Brazil a formula determines the amount of transfers according to population size and per capita income, while states and municipalities receive additional shares of royalties according to the level of onshore or offshore production. Table 4 provides a more detailed synthesis of derivation-based natural resource fiscal transfers in a selected number of more decentralized settings, including Indonesia, Nigeria, Papua New Guinea, Peru, Sudan, and Venezuela.

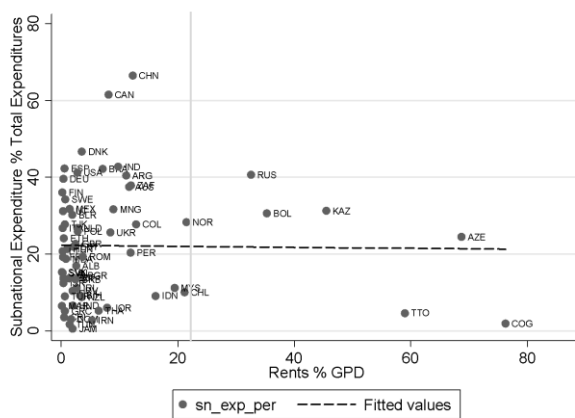
33. Moreover, some countries have implemented asymmetric or mixed models relative to resource extraction subnational entities. In addition to basic revenue derivation-based sharing, Indonesia granted additional allocations to its special autonomy regions of Aceh and Papua. Historically, these regions had been associated with significant secessionist tendencies and poor developmental outcomes. In an analogous manner, the Malaysian oil-producing provinces have a degree of special autonomy in addition to derivation-based revenue sharing in the context of a highly centralized federation.

34. A comparable variation is observed based on which level of government is responsible for setting tax bases and rates and carrying on the collection of rents from nonrenewable resources. In the vast majority of countries, taxes are set and administered by the national government and then are shared with the lower tiers. In several cases, however, federal and second-tier governments impose their own taxes on a shared basis as in Canada and the United States. The United Arab Emirates is the only country in which rents are collected solely by subnational governments and then shared with the central government in cash and in-kind. The emirates have full ownership over subsoil resources and collect royalties, company profit transfers, and income tax receipts. The transfers are negotiated yearly to smooth the budget (Ahmad and Mottu 2002).

35. Intergovernmental systems also distribute petroleum and mineral revenues that are raised through nontax mechanisms like production sharing and equity participation. Subnational governments also received revenues from production sharing in Indonesia, Malaysia, and Sudan and from equity participation in Papua New Guinea.

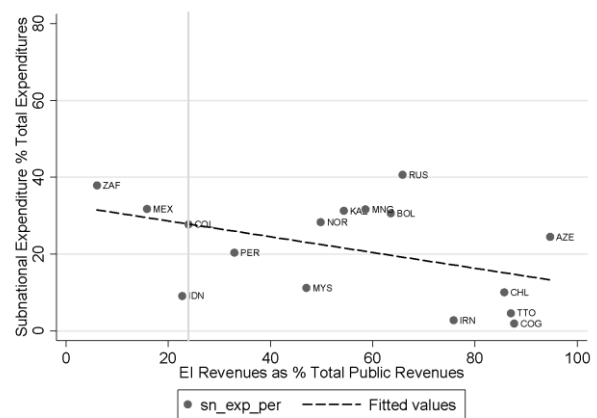
36. The degree to which countries have been able to implement predictable and rules-based transfer systems varies significantly. Although many countries have relatively transparent rules, in practice transfers are often subject to manipulation and delays. Transfers need to be transparent and predictable, based on need and fiscal capacity, and need to provide sufficient resources to undertake the devolved functions to yield results (Bahl and Linn 1994; Bird 2001; Ma 1997; Shah 2004). In the case of resource rent, transparency and predictability have additional implications given that uncertainty about the division of resource rents has been cited repeatedly as a central contributor to conflict and political volatility in resource-dependent countries (Herbst 2001). Given conceptions of ownership, subnationals may have a valid claim to receive a significant part of rents from a nonrenewable resource based on heritage arguments.

Figure 4: Decentralization and Resource Rents (percent), 2008.



Source: World Bank Decentralization Indicators 2012, Wealth of Nations Database 2010.

Figure 5: Decentralization and Revenue Dependence (percent), 2008.



Source: World Bank Decentralization Indicators 2012, Barma et al. 2012.

37. Overall, there is no apparent relationship between the types of intergovernmental distribution of functions and resources and the form of government or degree of decentralization. As well, resource abundance is not, positively or negatively, associated with the overall degree

of decentralization, measured as the share of public expenditures carried out by subnational governments (see Figure 4). If only resource dependent countries are considered, or those that derive more than 25 percent of GDP or public revenues from extractive industries, it appears decentralization is negatively correlated with resource dependence for this set of countries. However, this association should be considered with caution as this is a truncated sample.

V. Determinants of Revenue Sharing

38. The features of intergovernmental systems are largely dependent on how governments prioritize often-competing aims of national cohesion and conflict avoidance, local service delivery and effective macro-management. Whether more centralized or decentralized arrangements for managing oil and mining resource and their rents are more or less appropriate to a particular circumstance depends both on these objectives and the underlying political economy underpinnings of intergovernmental relations.

39. In opposition to the recommendations of the normative literature on fiscal federalism, most countries share revenues with subnational governments and have earmarking arrangements for producing regions. Such arrangements are the result of political bargains and historical legacies that are generally difficult to change. A recent stream of positive literature on federalism offers a more useful insight on why this may be the case. Recognition is growing that performance of federal and decentralized governments depend on their design, representative institutions, and parties (Eaton 2004), which in turn emerge as a response to underlying social, cultural, or demographic factors (Rodden 2007).

40. The so-called second generation literature has emphasized that fiscal federalism is frequently introduced as a means to protect the wealth of rich regions against threats of expropriation by other regions. Asset specificity and capital mobility, as well as horizontal inequality among regions shape the locus of tax power and expenditure responsibilities (Boix 2003). In settings with unevenly distributed endowments and pronounced income differences between regions, the redistribution preferences of the median voter in poorer regions can create pressures for tax centralization, which rich provinces will oppose. Without a strong center that is capable of redistributing rents across regions, federations risk dismembering. In the long run, if

federal institutions are maintained, they contribute to shaping interregional inequality (Beramendi 2007).

41. The allocation of rents from natural resources is frequently a vexing political question in developing countries where rents from natural resources account for a large share of total government revenues. The uneven distribution of natural resource rents creates additional strains on national unity and contestation of central-local government relations as it generally entails that small resource-rich (and often sparsely populated) regions share rents with larger areas.

42. Particularly in low income countries strong subnational claims on natural resources or historical neglect can be a source of conflict. If the people residing in the resource-rich regions are dissatisfied with the returns (mostly the resulting increased incomes) from the presence of natural resources because it does not meet their expectations, this may lead to political and social unrest (Ross 2007). Thus, citizens residing in a peripheral region may favor independence due to the appeal that ownership rights of the natural resource holds (Collier and Hoeffler 2002; Ross 2007). The recent attention to the impact of extractive industries on local communities and rights of indigenous people over such resources has generated calls for greater sharing (Otto 2001). Such claims, however, often are intertwined with a sense that central authorities have historically neglected resource-rich regions, and hence these regions need resources to provide these services.

43. In this context, federalism is often viewed as a means to balance centripetal and centrifugal forces in large and ethnically or culturally diverse societies (Filippov, Ordeshook, and Shvetsova 2004; Treisman 1999). By increasing development at the local level (Bakke and Wibbels 2006), reducing discretion and ambiguity of natural resource rents (Bird and Ebel 2006; Herbst 2001), and providing citizens with opportunities to shape policies (Brancati 2009), revenue-sharing mechanisms have the potential to solidify national unity and diffuse separatist sentiments. In addition, decentralization can enhance local autonomy and offers a setting in which minorities can enjoy self-rule at the regional level (Jeong 2002). Alternative regional arenas favor intragroup competition, which in turn reduces power struggles at the national level (Horowitz 2002).

44. In contrast, others warn about the potential negative incentives that sharing resource revenues can generate. When ethnic or linguistic minorities with historical grievances are concentrated in the same jurisdictions in which natural wealth is found, sharing revenues can strengthen their position to contest national unity. Thus, overlapping ethnic cleavages and distribution of resources can encourage disintegration (McLure 1994). Decentralization can increase ethnic conflict and secessionism indirectly by reinforcing ethnic and regional identities and promoting growth of regional parties (Brancati 2009). In the absence of political competition and adequate downward accountability mechanisms at the subnational level, decentralization can lead to elite capture, corruption, and weak government performance that reinforce regional inequalities (Jeong 2002). In addition, if no national consensus is reached and subnational actors view revenue-sharing arrangements as inequitable, conflict is likely to persist. What is equitable is largely going to be defined by the particular political context in which allocations across different regions are made and also is subject to changes over time (Herbst 1989, 2001).

45. Ultimately, the prospective outcome and options depend on governance thresholds and on overall characteristics of the political system, especially the degree of nationalization of parties and the availability of political and judicial channels to solve disputes over resources (Collier and Venables 2009). Bakke and Wibbels (2006) test for the determinants of intranational conflict in 22 federal settings. Their results suggest that “peace preserving merits of federalism depend not only on the design of institutions, but how these respond to the characteristics they govern.” Regional inequality and ethnic diversity are two key variables to consider in this regard. Copartisanship between the center and the regions averts conflict and holds the state together only when the national governments are inclusive to ethnic minority and majority regions.

46. There is no blueprint for intergovernmental institutions in these settings, but the nature of regional disparities (including natural resources), as well as party representation and political power should be taken into consideration. Care must be taken that intergovernmental design does not become too narrowly focused on distributional issues, but rather includes the range of complementary institutions that allow for credible and sustainable multilevel government and governance. These include the presence of checks and balances mechanisms (for example, through judicial institutions and inter- or intra-political party bargaining). In the absence of such institutional mechanisms, intergovernmental fiscal design could degenerate to short-term

contestation. Given significant price volatility associated with natural resource revenues, the combination of weak complementary institutions (including revenue management) and shifting demands can make for a precarious mix.

47. An important aspect of addressing these issues is to see this debate as being about significantly more than simply granting more resources. Subnational regions may be concerned about a number of other issues, rather than maximizing transfers in the short run. These issues may be about greater autonomy in certain areas. Such concerns, for example, can be addressed with asymmetric approaches to different regions, including those richly endowed with natural resources (Bird and Ebel 2007). Above all, when spending capacity of subnational governments are weak, alternative spending mechanisms to provide benefits to the population of resource-rich regions could be pursued. These could include unconditional or conditional cash transfer programs, linked to the existing resource wealth. Particular measures could be taken to encourage performance on the part of resource-rich regions.

VI. Macro-economic Considerations

48. A central issue is how to balance in the design of intergovernmental fiscal systems macroeconomic sustainability objectives and political pressures. Resource-dependent countries that were best able to weather the commodity price shocks of 2008/09, whether decentralized or not, had put in place effective medium-term revenue management measures. Numerous countries have formal saving or stabilization funds. Yet the rate that is saved during high commodity price and production periods varies considerably, as does the success of ensuring medium-term stability in government revenues during downturns (see Table 5). On the other hand, some countries like Bolivia and Iraq saved substantial amounts of resources because of their low budget execution, whereas others have built up foreign reserves, as in Russia and Kazakhstan. Although accumulated savings have been significant in the recent commodity boom period, they quickly can become vulnerable to rapid annual drawdowns outside of some established institutional criteria and mechanisms.

49. How windfall revenues are used and allocated across levels of government during commodity booms determines how much fiscal space countries had during the price bust to

smooth spending. If windfalls are used to finance current expenditures and wages and expand nonoil deficits, the social adjustment cost likely would be higher than if spending is delinked from commodity revenues. All political systems face intense pressures to spend during boom times, especially those in developing democracies where social and infrastructure needs are great. At the same time, investing or hedging oil savings implies high political risk if oil prices continue to increase and savings are lost. Recent experiences in Chile, Indonesia, Mexico, and Nigeria show that policy lessons from previous commodity cycles have motivated national authorities to follow prudent fiscal policies and avoid procyclical spending and excessive borrowing, both at the national and subnational levels.

Box 1: Mexico's Windfall Sharing and Hedging Experience

Mexico's federal government remains relatively dependent on oil revenues. Mexico is the seventh-largest oil producer in the world. The sector generates approximately 16 percent of export earnings but more than 35 percent of total government revenues. Although oil revenue in Mexico represents a significant share of revenue for the federal budget, state and local governments have been shielded from price volatility through several mechanisms. First, transfers are made after deducting energy subsidies. Second, only a limited part of petroleum rents are redistributed; 20 percent of ordinary extraction rights are incorporated into a general fund and distributed to the states based on a formula taking into account their characteristics. Producing municipalities received an extra 3.17 percent to compensate for the environmental damage that resulted from oil extraction. After the reference price (US\$70 per barrel) is surpassed, however, states receive an additional share of the windfalls, which diffuses pressures for redistribution during boom times. Third, a stabilization fund receives 10 percent crude oil production when the price is more than US\$32 per barrel and is on a sliding scale that starts at 1 percent when the price is below US\$22 per barrel. Part of the saved revenues have been used to diversify risk. Both in 1990–91 and in 2007–08, Mexico sold oil futures and used oil swaps to hedge price risks with highly successful results. These measures have made shared revenues more stable and have allowed for countercyclical public spending at the national and subnational levels.

Revenue-sharing rules are highly transparent and predictable and are accompanied with a high degree of consensus over the need for fiscal discipline. In 2009, the distribution formula was changed to encourage local governments to mobilize additional resources. States are guaranteed a threshold equivalent to the transfers received in 2007, but they will get additional transfers according to the relative weight of their own tax collection. Mexico has successfully diversified its economy. Nevertheless, it faces major challenges to diversify the sources of fiscal revenues and to increase the competitiveness of its oil industry. The monopoly held by the state-owned Petroleos Mexicanos (PEMEX), which suffers from chronic underinvestment and has made little exploration efforts in the past two decades, is likely to lead to a decrease in the levels of production in the near future that can compromise fiscal stability. In 2008, the Mexican Congress passed a law reforming the internal governance and accountability of the company to reverse the situation.

Macrofiscal Management: Aligning Incentives across the Intergovernmental System

50. High fiscal dependence on extractive sector creates vulnerability to price cycle and can lead to fiscal volatility. However, volatility can be addressed by smoothing oil revenues, most commonly achieved via saving funds and hedging of oil revenues that prevent the transmission of oil price volatility to the budget (Davis, Ossowski, and Fedelino 2003). Nevertheless, given various spending pressures, uncertainty about oil price, and political risk, stabilization institutions are difficult to implement credibly. Revenue diversification by broadening the overall tax base is another key strategy.

51. The theory of federalism explains that central governments are in a better financial and political position to smooth spending across boom cycles and offset the volatility associated with natural resources, which tend to be significantly higher than other sources of fiscal revenues. National governments have larger budgets and access to nonresource revenues and financial markets (McLure 1994). Optimally, when governments face price fluctuations, they would impose stabilizing rules to the intergovernmental transfers to protect subnational governments from the boom-bust cycle and smoothing will be done before the division of rents across levels of government. During boom periods, these rules would prevent current expenditures from being increased beyond a sustainable point, whereas in downturns, the central or federal governments would be able to use the saved funds to finance subnational deficits and resort to financial markets if necessary to secure additional resources (Gonzalez, Rosenblatt, and Webb 2002).

52. On the other hand, diversifying subnational sources of revenues could reduce vulnerability to price shocks of second- and third-tier governments. Local governments can raise a number of taxes without introducing major distortions on the extractive sector that discourage investment, such as property taxes and user fees (Otto 2001). These taxes are not linked to profitability and price fluctuations and are applied throughout the project life cycle, thus providing a more stable source of revenue. In addition, improving the overall capacity of subnational governments to tax nonextractive activities should be pursued concurrently.

53. Ideally, intergovernmental fiscal arrangements in resource-dependent settings will be consistent with overall revenue management and stabilization, and with the criteria by which revenues are assigned to subnational governments. Intergovernmental fiscal systems might

distribute the burden of stabilization across levels of governments in a different way and central governments might need to resort to bargaining or to other incentives to have discipline at the subnational level. Indonesia offers an example of a system that has combined overall revenue management strategies with a significant degree of fiscal decentralization (Box 2).

54. A key policy challenge in the presence of significant subnational assignments of resource revenues is to design some type of credible coordination device that encompasses both national and central levels of governments. The criterion of subnational revenue predictability suggests that particular emphasis should be placed on ensuring that subnational governments have some degree of medium-term predictability. Simple fiscal rules with conservative resource prices are typical strategies. Subnational governments may feel that national governments could use conservative pricing to withhold resource revenues from them. As a result of poorly designed sharing schemes, subnationals could begin to lobby for overly optimistic prices. A more promising strategy would be to ensure that subnationals see that it is in their interest to adhere to common fiscal rules. This could be achieved, for example, by providing them with access to stabilization mechanisms if prices in the future are less buoyant.

Box 2: Indonesia: Revenue Sharing, Equalization, and Special Autonomy

Indonesia's 2001 "Big Bang" decentralization saw the introduction of significant derivation-based natural-resource revenue sharing. The overall decentralization and the introduction of resource revenue sharing were driven largely by the desire to keep the country together, particularly after a history of decades of highly centralized authoritarian rules. Resource-rich provinces, in particular, had a sense that they did not adequately benefit from their resource wealth (Bahl and Tumennasan 2004). Before the far-reaching decentralization reform, all petroleum and mining revenues accrued to the central government and were not subject to any revenue-sharing arrangement with provincial and district-level governments. Since 2001, the central government distributes at least 25 percent of central government revenue to lower level governments through a general transfer mechanism through an equalization grant pool. In addition, producing districts and provinces were granted 15 percent of onshore oil revenue and 30 percent of onshore gas, whereas 64 percent of mineral royalties went to the regions and 16 to the provincial governments. Concurrently, to reduce centrifugal pressures, Aceh was granted 55 percent of oil revenues and 40 percent of rents from gas, and Papua was granted 70 percent of both.

Derivation-based sharing of oil revenues has not been without its challenges. Derivation-based sharing was associated with significant revenue disparities. In many cases, beneficiaries were not able to spend the windfall, and instead built up significant cash reserves. The aggregate buildup of reserves fueled the perceptions that provinces and districts were receiving too many transfers relative to their expenditure responsibilities (Lewis 2005). The allocation of natural resource was to some extent offset by the introduction of a formula-based equalization grant (the DAU), which now accounts for more than 25 percent of total national revenues (net of shared revenues). The formula incorporates measures for fiscal capacity, which mean that regions benefiting for resource revenues receive

fewer equalizing transfers (Hofman et al. 2006).

The government has addressed the issue of fuel subsidies. In the past decade, Indonesia has been a borderline net energy exporter and importer. The fact that energy prices were pegged below international prices resulted in the rapid growth of fiscal liabilities in this area. During the oil boom, nearly one-third of central government expenditures were claimed by fuel subsidies, while derivation-based transfer liabilities were increasing. Although the government was able to institute political unpopular price increases (in part through the introduction of a large compensation package, including conditional transfer schemes to households), energy subsidies continue to be a reality in Indonesia. Starting 2009, the government reduced the divisible DAU pool under a burden-sharing program to account for energy subsidy liabilities. Fuel subsidies are deducted from the rents before sharing. Moreover, the government has earmarked petroleum revenues, and in 2009, an additional 5 percent of oil and gas revenues were transferred to regional governments for spending on primary education. This policy was pursued as part of a prudent fiscal policy and countercyclical macroeconomic policies for stabilizing the external and internal balances.

Natural Resources and Subnational Governance: Linking Natural Resources to Outcomes

55. Fiscal autonomy may create incentives for local government to expand the local tax base by promoting economic growth and moderating tax rates. These incentives are weakened by the presence of significant natural resource revenues. By reducing the need to mobilize resources locally to finance public services, subnational governments have less need to take into account the demands of taxpayers. In this manner, resource-rent dependence at the subnational level poses accountability challenges that negatively affect the quality of service delivery in the localities in which these revenues are concentrated. Historical evidence from the United States points to poorer outcomes in the resource-dependent states, notably Texas and Louisiana (Goldberg et al. 2008).

56. Emerging evidence from developing countries shows that large transfers to producing states and municipalities have not yielded the social and growth outcomes that were anticipated. For example, in Brazil, 60 percent of royalties are paid by the national oil company Petrobras to states and municipalities on whose territory the oil is extracted. Although per capita public spending on education and health is higher in these communities, local populations have not experienced improvements in the quality and quantity of public services (Caselli and Gennaioli 2007; Caselli and Michaels 2009). Most of the windfall revenues have been used to increase government wages. At the same time, households have reported less welfare income than their counterparts in nonproducing districts and no visible improvements on the quality of housing and infrastructure have been achieved. Moreover, municipal gross domestic product growth in these localities fell after the introduction of royalties in 1997 (Slaibe Postali 2009).

57. Linking the intergovernmental transfers to performance and downward accountability mechanisms is crucial to prevent shared rents from being captured by elites or being used to enlarge subnational governments with no real impact on the quality and quantity of public services. Efforts to build local capacity and mobilize stakeholders for good governance should be an integral component of decentralization policies. Simultaneously, enhancing the ability of the states to raise their own revenues can increase the accountability of subnational governments for their fiscal performance (Boadway and Shah 2009).

VII. Conclusion

58. The design and implementation of measures to improve intergovernmental management of the oil, gas, and mining sector must consider the core policy objectives, fiscal context, and overall political structure. Paying attention to the political economy constraints and drivers that shape intergovernmental relations is critical to identify the feasible reforms and alternatives to improve performance that are available in a given country. Most of the attention in this area has been focused on benefit sharing or distribution. Intergovernmental relations, however, are shaped by the underlying distribution of political, economic, and demographic endowments and as such are highly politicized. Policy makers need to address both the aggregate challenge of effective management of natural resource extraction and managing its fiscal benefits across various policy objectives. In many settings, this entails managing across time and across levels of government and territory.

59. Practitioners need to be able to draw on the normative literature and actual international experiences to address the concerns of their specific country context. This survey of different experiences highlights the importance of achieving a consensus simultaneously around stabilization and intergovernmental fiscal rules. Choices and trade-offs need to be considered in light of the particular historical political-economy circumstances of the country of interest. Intergovernmental bargaining not only should not be centered on benefit sharing, but also should consider the systemic effects that these rents have on fiscal sustainability. Although constitutional design (for example, federal or unitary) can play a critical role in framing policy options, de facto implementation ultimately will determine how successful resource-rich

countries with significant intergovernmental dynamics are in harnessing natural resources for development.

60. Decentralization in these settings should not expect inherently better or worse outcomes, but rather understand that results will depend on the institutional context of each setting. These findings echo the thrust of the recent literature on natural resources (Dunning 2008, Haber and Menaldo 2011). Natural resources are not intrinsically good or bad for development, but developmental impacts depend on how countries take advantage of them. In some cases, intergovernmental dynamics can provide useful checks and balances (or spaces for subnational innovation on central authorities), whereas in others, they can weaken effective intergovernmental coordination. In the extreme, poor management and weak institutions may undermine national cohesion or even increase the risk of conflict and civil war.

61. Countries have resorted to different intergovernmental arrangements to achieve diverging objectives. The cross-sectional survey reveals that intergovernmental fiscal design choices are mostly determined by how governments prioritize the competing objectives of territorial cohesion, economic stability, equalization of service delivery standards, and maximization of the wealth derived from natural resources across space and time. Institutional alternatives, therefore, should be evaluated in light of the core objectives that each country is pursuing and should consider how well they are able to juggle these with the other goals. The underlying political economy conditions will determine whether objectives are conflicting and how successful countries will be in using intergovernmental systems to solve them.

62. The variation is reflected in differences in the vertical share of natural rents allocated to subnational entities, the criteria used to distribute them across second- and third-tier governments, and the instruments through which the rents are shared. The size of the pool of resources that are to be shared across cases ranges widely. Some central governments allocate resources to producing and nonproducing localities; however, in other countries, resource-rich states and provinces enjoy especial autonomy and receive a larger part of the rents. Rents are divided by giving the different levels of government tax prerogatives over a shared base or through vertical transfers. At the same time, transfers, which can be automatic or linked to

performance, are allocated through derivation, cost reimbursement, or on the basis of an equalization formula, or are earmarked to a particular public service.

63. The amount of rents being shared is as important as the transparency and credibility of the intergovernmental sharing arrangements. To fulfill their functions effectively, subnational governments need a stable and predictable institutional and fiscal environment. Transparency and predictability will contribute to ease intergovernmental tensions and facilitate policy dialogue around possible reforms. Smoothing resources available to subnational governments across commodity price cycles is an important factor in this regard. Lastly, linking financing to better sectoral and subnational priorities and improved performance is critical to avoid some of the negative consequences that excessive dependence on natural resources may generate for governance and accountability.

64. The choice of intergovernmental systems not only is the result of different goals, but also is influenced by the resource profile and the overall degree of diversification of the economy of a country. Whether a country is a mineral or a petroleum producer, how much known reserves it possesses, where they are located, and the level of fiscal dependence will determine the range of intergovernmental arrangements that are fiscally and politically feasible. Countries that are highly dependent on resource rents will be able to distribute a smaller share of total resource rents, and their ability to compensate the producing regions for the extraction of nonrenewable resources will be more limited than countries with a more developed and diversified economy. A key concern will be whether prevailing legal and regulatory frameworks, policy-making mechanisms, and most important, de facto implementation are immune (or flexible) to the volatility in natural-resource prices and territorial production patterns. Policy makers need to strategically assess the extent to which prevailing arrangements are consistent with the effective management of the sector (for example, in terms of exploration and exploitation patterns), national cohesion and stability, macrofiscal sustainability, and broad-based development. At the same time, policy makers and international development partners need to remain continually aware that feasible options will be conditioned by the political-economy setting.

65. Yet in any context it would be critical to: (i) align incentives across the intergovernmental systems, reducing moral hazard; (ii) achieve consistency of intergovernmental fiscal systems and

macroeconomic stability (iii) smooth revenue volatility before sharing the benefits; (iv) diversify subnational revenues; (v) link natural resource finance transfers to outcomes (transparency in the transfers and downward accountability mechanisms); (vi) secure national unity without introducing large horizontal inequalities; and (vii) enhance predictability of transfers and clarity on the rules (over quantity).

Table 3. Basic Characteristics of Resource Dependent Countries

Country	Population (millions, 2010)	Area (1,000 sq km)	GDP per Capita (US\$, 2010)	EI Rents per Capita	EI Share of Total Exports (%)	EI Revenue Share of Total Public Revenues (%, 2007-2009)	Oil and Gas Share of Total Exports (%) 2007-2009)	Oil and Gas Revenue Share	Mining Share of Total Exports (%, 2007-2009)	Mining Revenue Share of Total	National Oil/ Mining Company	Extractive Industry	Stabilization Fund	Subnational Expenditures as % of Total Public Expenditures
Algeria	34.4	2,382	4,460	2,111.5	98.5	68.6	98.5	68.6	.. ..	..	Yes	No	No	n.a.
Angola	18.0	1,247	3,960	3,138.0	95.6	83.6	95.6	83.6	¾	¾	No	No	No	n.a.
Azerbaijan	8.7	87	5,180	3,661.1	94.7	53.4	94.7	53.4	.. ..	..	Yes	Compl.	No	24.5
Bahrain	0.8	1	25,420	11,407.9	79.8	85.5	79.8	85.5	.. ..	..	No	No	No	2.8
Bolivia	9.7	1,099	1,790	606.8	63.5	70.0	44.4	26.0	19.1	44.0	Yes	No	No	30.6
Botswana	1.9	582	6,890	362.4	64.2	13.9	..	..	64.2	13.9	No	No	No	4.8
Brunei Darussalam	0.4	6	31,180	23,436.0	97.2	60.0	97.2	60.0	.. ..	..	No	No	No	n.a.
Cameroon	18.9	475	1,160	152.9	33.3	38.2	33.3	38.2	.. ..	..	Yes	Yes	No	n.a.
Chad	11.1	1,284	600	392.3	84.3	57.1	84.3	57.1	.. ..	..	Yes	No	No	n.a.
Chile	16.8	757	9,940	2,150.8	55.7	22.7	..	..	55.7	22.7	Yes	No	Yes	10.0
Colombia	44.5	1,142	5,510	695.3	23.9	¾	23.9	¾	¾	¾	Yes	No	Yes	27.7
Congo, Dem. Rep.	64.2	2,345	180	13.9	94.6	¾	25.0	..	69.6	..	Yes	Yes	No	n.a.
Congo, Rep.	3.6	342	2,310	2,260.8	87.7	86.0	87.7	86.0	.. ..	..	Yes	Yes	No	1.9
Ecuador	13.5	284	4,510	1,268.3	¾	49.0	..	49.0	.. ..	..	Yes	No	Yes	n.a.
Equatorial Guinea	0.7	28	14,680	17,385.9	98.9	93.5	98.9	93.5	.. ..	..	Yes	Yes	No	n.a.
Gabon	1.5	268	7,760	4,727.1	77.3	65.7	77.3	65.7	.. ..	..	No	Yes	No	n.a.
Ghana	23.4	239	1,240	60.5	65.4	¾	¾	¾	65.4	..	Yes	Compl.	No	n.a.
Guinea	9.8	246	380	29.3	89.9	24.5	89.9	24.5	.. ..	..	No	Yes	No	n.a.
Indonesia	228.3	1,905	2,580	364.0	22.7	29.3	22.7	29.3	.. ..	..	Yes	No	No	9.1
Iran, Islamic Rep.	72.0	1,745	4,530	2,351.2	75.8	69.2	75.8	69.2	.. ..	..	Yes	No	Yes	2.7
Iraq	31.2	438	2,320	2,468.2	97.5	81.0	97.5	81.0	.. ..	..	Yes	No	No	n.a.
Kazakhstan	15.7	2,725	7,440	3,870.6	54.3	44.6	54.3	44.6	.. ..	..	Yes	Yes	No	31.3
Kuwait	2.7	18	43,920	35,226.7	94.4	72.1	94.4	72.1	.. ..	..	Yes	No	Yes	n.a.
Kyrgyz Republic	5.3	200	880	14.4	59.0	¾	..	..	59.0	..	No	Yes	No	25.5
Lao PDR	6.2	237	1,000	¾	50.4	¾	..	..	50.4	..	No	No	No	n.a.
Libya	6.3	1,760	12,020	9,232.4	97.5	89.7	97.5	89.7	.. ..	..	No	No	No	n.a.
Malaysia	27.0	330	7,900	1,593.1	47.0	13.0	47.0	13.0	.. ..	..	Yes	No	No	11.2
Mauritania	3.2	1,031	1,060	451.0	34.7	11.0	..	11.0	34.7	..	No	Yes	No	n.a.
Mexico	106.4	1,964	9,330	1,068.3	15.8	35.6	15.8	35.6	.. ..	..	Yes	..	Yes	31.8
Mongolia	2.6	1,567	1,890	178.0	58.6	28.9	..	..	58.6	28.9	No	Compl.	No	31.7
Namibia	2.1	824	4,650	135.9	58.8	6.3	..	..	58.8	6.3	No	No	No	n.a.
Niger	14.7	1,267	360	¾	91.5	42.0	..	..	91.5	42.0	Yes	Yes	No	n.a.
Nigeria	151.3	924	1,180	492.0	97.5	83.7	97.5	83.7	¾	¾	Yes	Yes	Yes	n.a.
Norway	4.8	324	85,380	19,903.9	49.8	39.1	49.8	39.1	.. ..	..	Yes	Yes	Yes	28.3

Country	Population (millions, 2010)	Area (1,000 sq km)	GDP per Capita (US\$, 2010)	El Rents per Capita	El Share of Total Exports (%)	El Revenue Share of Total Public Revenues (%, 2007-2009)	Oil and Gas Share of Total Exports (%) 2007-2009)	Oil and Gas Revenue Share	Mining Share of Total Exports (%, 2007-2009)	Mining Revenue Share of Total	National Oil/ Mining Company	Extractive Industry	Stabilization Fund	Subnational Expenditures as % of Total Public Expenditures
Oman	2.8	310	17,890	11,121.9	81.0	86.3	81.0	86.3	..	..	No	No	Yes	n.a.
Papua New Guinea	6.5	463	1,300	431.0	80.6	34.3	..	..	80.6	34.3	No	No	Yes	n.a.
Peru	28.8	1,285	4,710	532.4	32.9	25.0	..	..	32.9	25.0	Yes	Yes	No	20.4
Qatar	1.3	11		43,484.8	88.9	64.5	88.9	64.5	..	..	Yes	No	No	n.a.
Russian Federation	141.8	17,098	9,910	3,825.9	65.8	32.8	65.8	32.8	¾	¾	Yes	Yes	Yes	40.7
Sao Tomé e Príncipe			1,200	¾	¾	¾	¾	¾	..	..	No	No	No	n.a.
Saudi Arabia	24.7	2,150	17,200	13,445.4	89.7	89.3	89.7	89.3	..	..	Yes	No	No	n.a.
Sierra Leone	5.6	72	340	3.0	90.3	¾	..	..	90.3	..	No	Yes	No	n.a.
South Africa	48.7	1,219	6,100	679.4	6.0	2.0	..	..	6.0	2.0	Yes	No	No	37.9
Sudan	41.4	2,506	1,270	371.3	90.2	55.7	90.2	55.7	..	..	Yes	No	No	n.a.
Syrian Arab Republic	21.2	185	2,640	659.7	39.7	29.6	39.7	29.6	..	..	Yes	No	No	n.a.
Timor Leste	1.1	15	2,220	¾	97.3	98.2	97.3	98.2	..	..	No	Yes	Yes	n.a.
Trinidad and Tobago	1.3	5	15,380	11,484.1	87.0	57.8	87.0	57.8	..	..	Yes	No	No	4.6
Turkmenistan	5.0	488	3,700	5,555.5	77.3	¾	77.3	¾	..	..	No	No	No	n.a.
United Arab Emirates	4.5	84		21,716.8	43.3	70.2	43.3	70.2	..	..	Yes	No	Yes	n.a.
Uzbekistan	27.3	447	1,280	824.1	36.9	17.2	22.7	¾	14.3	17.2	Yes	No	No	n.a.
Venezuela, RB	27.9	912	11,590	3,470.8	81.2	46.3	81.2	46.3	..	..	Yes	No	Yes	n.a.
Vietnam	86.2	329	1,100	187.4	17.5	31.0	17.5	31.0	..	..	Yes	No	No	n.a.
Yemen, Rep.	23.1	528	1,060	375.0	98.9	68.1	98.9	68.1	..	..	No	Yes	No	n.a.
Zambia	12.6	753	1,070	221.8	66.7	¾	..	..	66.7	¾	No	Yes	No	n.a.
Total	1,473.0	Average	7,952.9	5,392.0	69.4	50.6	70.1	58.0	54.0	23.6				19.9

Source: Barma et al. 2012, World Bank Decentralization Indicators 2012.

Note:

Population, area, and GDP per capita from WDI and Government Finance Statistics database.

Subnational governments' share of total government expenditures; that is, the percentage of total expenditures accounted for by subnational governments, measured as the sum of local and provincial total expenditures excluding current and capital transfers to other levels of government, divided by the sum of local, provincial, and national expenditures, excluding intergovernmental transfers to lower tiers.

Table 4. Intergovernmental Transfer Design in Resource-Rich Settings

Country	Primary Goal	Main Transfer Schemes	Allocation Criteria/Formula
AFRICA (AFR)			
Congo, Dem. Rep. of	Equalization	Derivation-based revenue sharing and equalization fund. Broad outlines set by 2006 Constitution, and implementation, pending further regulations, set out in annual budget laws.	40 percent of revenue collected is to be transferred to the provinces and an additional 10 percent is to finance an equalization fund for all the provinces. ^a Distribution of mineral royalties: 40 percent of mining royalties, as well as 10 percent of surface rents should be conceded to the provinces, including 25 percent for the provincial administration and 15 percent for the area where mining activities were conducted.
Nigeria	Equalization of service delivery capacity; strong focus on rules-based block transfers to states and local government authorities (LGAs)	Extensive revenue sharing. General and derivation-based sharing to state and local governments. Automatic transfer combined with stabilization mechanism (oil-price-based fiscal rule by transferring oil revenues to the budget in accordance with a reference price, together with a ceiling on the nonoil deficit). Production sharing. Direct mechanisms of partial revenue redistribution to nonproducing regions.	All oil revenues are received into the Federation Account. The revenue-sharing formulas are set by an act of the National Assembly. The central government distributes the pool according to a formula that takes into account population and state size. Nigeria shares 45 percent of federal revenues with states and municipalities. For natural resource revenues, the constitution provides that oil-producing states receive 13 percent up front of the net oil revenue as derivation grants; the federal government receives 52.7 percent, states 26.7 percent, and local governments 20.6 percent. ^b New revenue-sharing rule adopted in 2007. ^c
Sudan (prior to 2011)	Stabilization objective: excess oil revenues are transferred into a fund for future generations	Derivation-based revenue sharing with South and producing provinces based on realizations. Main beneficiary South Sudan. Production sharing. Excess oil revenues are saved in the Oil Revenue Stabilization Account (ORSA) whenever the production reaches more than 2 million barrels a day.	The wealth-sharing protocol requires that a significant portion of the additional oil revenue is automatically transferred to the states if not saved in the ORSA. At least 2 percent of oil revenue shall be allocated to the oil-producing states and regions in proportion to output produced in such states and regions. After the payment to the ORSA and to the oil-producing states and regions, 50 percent of net oil revenue derived from oil-producing wells in Southern Sudan shall be allocated to the Government of Southern Sudan (GOSS). ^d A Future Generation Fund shall be established once national oil production reaches 2 million barrels per day.
Eastern Europe/Central Asia (ECA)			
Russian Federation	Equalization of fiscal capacity and expenditure	Provides both shared revenues and transfers to states. Tax revenue sharing. Natural resource taxes are collected mainly by subnational governments as an important source of own-source revenue in oil-producing regions.	The government provides transfers based on a nonderivation formula basis, which benefits the poorer and non-natural-resource-endowed regions. Intergovernmental Transfer Formula: (1) 40 percent to federation (2) 30 percent to producing oblasts (3) 30 percent to rayon and cities
East Asia/Pacific (EAP)			
Indonesia ^e	Achieve the equal provision of minimum standards in	Some derivation-based revenue sharing, including from oil and gas.	Producing provinces receive fixed proportions of revenues: Aceh: 55 percent of oil revenues and 40 percent of gas revenues

	services; equalizing block grants for local governments	<p>Straight automatic transfer with no stabilization mechanism.</p> <p>Production sharing.</p> <p>Additional earmarked grants may be distributed for specific purposes based on a formula that takes into account both revenue capacity and expenditure needs.</p> <p>In 2009, an additional 5 percent of oil and gas revenues was transferred to regional governments earmarked for spending on primary education.</p> <p>Direct mechanisms of partial revenue redistribution to nonproducing regions.</p>	<p>Papua: 70 percent of oil revenues and 70 percent of gas revenues</p> <p>In addition to own source, districts and provinces enjoy 15 percent of onshore oil revenue and 30 percent of onshore gas revenue transferred to the originating provinces as well as an equalization block grant (DAU).^f</p> <p>The equalization grant pool is a fixed percentage (25 percent) of central resources after tax sharing with the regions: the central government distributes at least 25 percent of central government revenue to be transferred to all lower level governments through a general transfer mechanism.</p> <p>Distribution of mineral royalties: 80 percent of mineral royalties go to the regions (64 percent to regencies and 16 percent to provincial government) and 20 percent to central government.</p>
Malaysia	Fiscal equalization objectives	<p>Annual equalization grants to equalize the difference between fiscal capacities and fiscal needs of the local authority.</p> <p>Production sharing (some direct sharing of oil revenues to states).</p>	<p>Revenues from all oil and gas industries are “pooled” together.</p> <p>Derivation is used as the primary basis for revenue allocation. Most grants are based on objective criteria except for deficit grants that are granted exceptionally.</p> <p>Formula: population (50 percent), GDP per capita (50 percent).</p> <p>The government collects oil royalties of which 5 percent are passed to the states of Sabah, Sarawak, and Terengganu and the rest are retained by the federal government.</p>
Papua New Guinea		<p>By law,^g revenues distributed at the subnational level cannot be greater than 20 percent of the net total revenues.</p> <p>Dividends from equity in mining and oil projects.^h</p> <p>Development levy (2 percent of value) shared among local and provincial governments.</p> <p>Mining and oil royalties (2 percent of value).</p> <p>No redistribution mechanism to benefit nonproducing territories.</p> <p>Revenues shared at the local level are earmarked.</p>	<p>No formula-based redistribution according to specific characteristics.</p> <p>Depends on the provincial government's share of the project. Derivation to the province owning equity in the mining or oil project: the 2 percent mining royalty is shared between provincial government (80 percent) and landowners (20 percent).</p> <p>Different shares of royalties are transferred to provincial governments. These are set out in the Memorandum of Agreement for the project.</p> <p>Derivation to the province in which the project is located.</p> <p>Special support grant (1 percent royalty) is paid on a derivation basis to the provincial government (20 percent goes to the producing local government).</p>
Middle East/North Africa (MENA)			
	Iraq	No explicit natural resource sharing.	Prevailing de facto arrangements: comanagement of hydrocarbon exploitation in endowed regions, and fair distribution based on population and historical damages. ⁱ
United Arab Emirates	Stabilization tool	<p>Oil revenues are collected by a subnational government and redistributed according to a specific rule or formula.</p> <p>Emirates have full ownership and control over their oil resources.</p>	<p>Upward sharing of revenues to federal account.^j</p> <p>Cash contributions are negotiated each year between the federal government and each of the seven emirates.</p>

Latin America (LAC)			
Bolivia	Fiscal equalization objectives	<p>High-level of derivation-based revenue sharing.</p> <p>Partial revenue redistribution from central pool (allocations from equalization funds) to nonproducing local jurisdictions (20 percent of the revenues).</p> <p>Specific automatic transfer.</p> <p>Tax revenue sharing, no production sharing.</p> <p>Revenues shared at the local level are earmarked.</p>	<p>A Departmental Compensation Fund was created to mitigate the imbalance in the oil rents distribution: departments with per capita royalties below the national average will receive a compensatory transfer by the TGN.</p> <p>No formula-based redistribution taking into account sociodemographic characteristics.</p> <p>Departmental royalties are directly transferred by YPF to oil-producing departments (11 percent) and two departments as compensation (1 percent).^k</p>
Brazil	Fiscal equalization objectives	<p>Revenue derived from signature bonus accrues to the Petroleum Regulatory Agency (ANP) to fund its activities.</p> <p>Equalization transfers represent a large allocation of resources.^l</p> <p>The federal government transfers a specified share of certain federal taxes to a pool, and the council of states determines state shares using a formula.</p> <p>Offshore oil revenues are also shared.</p>	<p>The states receive 21.5 percent of these tax revenues: 85 percent going to the north, northeast, and center-west regions, and the remaining 15 percent to the south and southeast regions (which are economically better off).</p> <p>The formula for determining state shares is complex and based on population size and per capita income.</p> <p>Royalties are shared according to formulas that varies if it is onshore^m (52.5 percent to producing states) or offshoreⁿ production.</p> <p>0.5 to 1 percent of the value of total production from all land-based fields as special royalties should be paid to the landowners in Brazilian currency on a monthly basis.^o</p> <p>Gross revenue on production^p is distributed according to the following formula: 40 percent to producing states, 10 percent to producing municipalities, 50 percent to federal ministries.</p>
Colombia ^q	Fiscal equalization objectives	<p>Tax revenue sharing.</p> <p>Allocation of royalty shares.</p> <p>Transfers from the Oil Savings and Stabilization Fund (FAEP).</p> <p>Allocations from equalization funds to nonproducing local jurisdictions.</p> <p>No production sharing.</p>	<p>Royalties are distributed to indigenous communities.</p> <p>Transfers from the FAEP are shared among all subnational governments according to a formula taking into account population and tax revenue performance.</p> <p>Royalties are transferred to oil-producing departments (47.5percent), municipalities (12.5 percent), ports (8 percent), and National Royalties Fund (32 percent).</p>
Ecuador	Stabilization tool	<p>FEIREP^r was created to reduce public debt and to stabilize revenues (FAC), it was replaced by CEREPS.^s</p> <p>In April 2008, the CEREPS was eliminated and the net revenues^t transferred to the government to finance public investment.</p>	<p>Minimal revenue sharing with regions.</p> <p>Specific rents are distributed to indigenous communities.</p> <p>80 percent of decentralized revenues go to ECORAE^u that distributes the resources to provincial municipalities in the Amazon region and then delivers the remainder to a regional fund.</p>
Mexico	Stabilization tool	<p>Limited revenue sharing.</p> <p>Minimal derivation-based revenue.</p> <p>No production sharing.</p> <p>Resources are channeled through a general pool of shared resources and distributed according to a formula.</p> <p>Direct mechanisms of partial revenue</p>	<p>Formula-based redistribution:^v</p> <p>20 percent of ordinary extraction rights (incorporated into a general fund and distributed to the states based on a formula taking into account their characteristics).</p> <p>3.17 percent of the additional oil extraction rights (earmarked for municipalities in oil-producing regions to compensate for environmental damage).</p>

		redistribution to nonproducing regions.	
Peru	Derivation-based sharing mechanisms	Derivation-based revenue sharing (Canon Minero Mechanism). Mining royalty. Camisea Development Fund (FOCAM). ^w Regional Compensation Fund (FONCOR). ^x	20 percent of mining activities taxes distributed to regional and 30 percent to local governments. 5 out of 24 regions receive a Canon. ^y Mining royalties are distributed to producing areas and are used to finance productive investment that promotes sustainable economic development. 5 percent earmarked to research at universities. Formula-based redistribution of Canons to producing areas, used to finance investment projects with regional impacts: 20 percent are earmarked to universities and research and 20 percent to infrastructure maintenance. In 2001, the proportion of taxes to be redistributed to subnational government was increased from 20 percent to 50 percent. New formula for equalizing transfers taking into account the gap between regional unmet needs and other transfers that the region may receive (including Canons and royalties). Distribution from the FOCAM to areas crossed by the gas pipes and takes into account the pipe length, population, and unmet basic needs.
Venezuela, Rep. Bol. de	Stabilization tool	Revenue-sharing agreements. Transfers. No production sharing.	20 to 25 percent of total central government revenues are distributed to regions. In addition, subnational governments are entitled to 20 to 30 percent of oil royalties.

Source: Kaiser and Mehri 2009.

Note:

- a. The 2006 Constitution provides for significant decentralization to provincial and local authorities and the Mining Code provides for the distribution of mineral royalties.
- b. Article 162 (2) of the Constitution of the Federal Republic of Nigeria, May 1999.
- c. The new sharing rule was adopted in 2007 by the Federation Accounts Allocation Committee (FAAC) to the effect that in any month when total revenue available for sharing fell below the budgetary target, the shortfall was taken out from the ECA and is considered as revenue sharing and not drawdowns.
- d. Constitution of Southern Sudan signed December 2005, Interim National Constitution ratified July 5, 2005.
- e. Until 2000, all oil and gas revenues accrued to the central government and were not subject to any revenue-sharing arrangement with provincial and district-level governments.
- f. Revenue-sharing arrangements are made according to the Indonesian Law on Fiscal Balance (Law 25/99).
- g. Provision in the Oil and Gas Act 1998, which regulates the exploitation of natural resources and the allocation of revenues, forbids that the aggregate revenues distributed for subnational levels be greater than 20 percent, so by law the central government receives 80 percent of oil and gas revenues.
- h. Transfers made by the Minerals Resource Development Company, and by Ok Tedi Sustainable Development Program in the case of Western Province.
- i. Article 109 of the Constitution of the Republic of Iraq, approved by Referendum on October 15, 2005. All oil revenues accrue to the New York–based foreign currency accounts of the Development Fund for Iraq (DFI) (under the 2006 arrangements).
- j. The United Arab Emirates Constitution made permanent in 1996.
- k. The four producing departments (Santa Cruz, Cochabamba, Tarija, and Chuquisaca) receive 11 percent, whereas Beni and Pando receive 1 percent of gross hydrocarbon production as compensation.
- l. Petroleum Law No. 9478 of 1997.
- m. Onshore royalty sharing formula (royalties in excess of 5 percent of production): 52.5 percent to the state where the production takes place, 15 percent to the municipalities where the production occurs, 7.5 percent to the municipalities affected by operations of landing or shipment of oil or natural gas, and 25 percent to the Ministry of Science and Technology.

- n. Offshore royalty-sharing formula (royalties in excess of 5 percent of production): 22.5 percent to the states fronting the production area, 22.5 percent to the municipalities fronting the production area, 15 percent to the Ministry of Defense responsible for the Navy, 7.5 percent to the municipalities affected by operations of landing or shipment of oil and gas, 7.5 percent to a special fund to be distributed to all states and municipalities in Brazil, and 25 percent to the Ministry of Science.
- o. Article 52 of the Brazilian Petroleum Law specifically provides that the concessionaire must set aside this special royalty.
- p. Minus investments, costs, taxes, and royalties.
- q. Until 2001, the constitution specified compulsory intergovernmental transfers to subnational governments and these reached 47 percent of the central government's revenues in 2002. A constitutional amendment in 2001 delinked subnational transfers from current revenues of the central government after seven subnational governments had to restructure their debt.
- r. FEIREP = Fund for Stabilization, Social and Productive Investments, and Public Debt Reduction.
- s. CEREPS' allocation of revenues: 35 percent for repurchase of public debt and productive projects, 20 percent (FAC) for contingencies and stabilization of revenues, 30 percent for education and health, 5 percent for roads repairs, 5 percent for environmental repair, and 5 percent for research and development.
- t. CEREPS net revenues reached US\$613.2 as of December 31, 2006. No information is available for 2007.
- u. ECORAE: The Institute for the Ecological Development of the Amazon Region is in charge of planning the sustainable development of the Amazon region in Ecuador.
- v. Established by the law on fiscal coordination in which subnational governments have considerable expenditure responsibilities, and most of their revenues are in the form of conditional transfers and revenue-sharing agreements totaling about 7 percent of GDP.
- w. 25 percent of the gas royalties goes to the FOCAM and are distributed to areas crossed by the gas pipes.
- x. The allocation of the Regional Compensation Fund (FONCOR) accounted for 31 percent of transfers to regional governments in 2006 and changed in 2008 to make it more equalizing.
- y. Canon: royalty share according to a percentage of the gross value of oil production in the region. It is on average equivalent to 44 percent of the royalty.

Table 5: Saving and Stabilization Institutions in Resource-Rich Settings, 2012

Country	Fund Name	Assets US\$ billion	Inception	Origin	Linaburg- Maduell Transparency Index
Algeria	Revenue Regulation Fund	56.7	2000	Oil	1
Australia	Australian Future Fund	80	2006	Non-Commodity	10
Azerbaijan	State Oil Fund	30.2	1999	Oil	10
Bahrain	Mumtalakat Holding Company	9.1	2006	Non-Commodity	9
Botswana	Pula Fund	6.9	1994	Diamonds and Minerals	6
Brazil	Sovereign Fund of Brazil	11.3	2008	Non-Commodity	9
Brunei	Brunei Investment Agency	30	1983	Oil	1
Canada	Alberta's Heritage Fund	15.1	1976	Oil	9
Chile	Social and Economic Stabilization Fund	15	2007	Copper	10
Chile	Pension Reserve Fund	4.4	2006	Copper	10
East Timor	Timor-Leste Petroleum Fund	9.9	2005	Oil and Gas	6
Equatorial Guinea	Fund for Future Generations	0.08	2002	Oil	n.a.
Gabon	Gabon Sovereign Wealth Fund	0.4	1998	Oil	n.a.
Indonesia	Government Investment Unit	0.3	2006	Non-Commodity	n.a.
Iran	Oil Stabilisation Fund	23	1999	Oil	1
Ireland	National Pensions Reserve Fund	30	2001	Non-Commodity	10
Kazakhstan	Kazakhstan National Fund	58.2	2000	Oil	8
Kiribati	Revenue Equalization Reserve Fund	0.4	1956	Phosphates	1
Kuwait	Kuwait Investment Authority	296	1953	Oil	6
Libya	Libyan Investment Authority	65	2006	Oil	1
Malaysia	Khazanah Nasional	36.8	1993	Non-Commodity	5
Mauritania	National Fund for Hydrocarbon Reserves	0.3	2006	Oil and Gas	1
Mexico	Oil Revenues Stabilization Fund of Mexico	6.0	2000	Oil	n.a.
Mongolia	Fiscal Stability Fund	n.a.	2011	Mining	n.a.
Nigeria	Nigerian Sovereign Investment Authority	1	2011	Oil	n.a.
Norway	Government Pension Fund – Global	611	1990	Oil	10
Oman	State General Reserve Fund	8.2	1980	Oil and Gas	1
Oman	Oman Investment Fund	n.a.	2006	Oil	n.a.
Papua New Guinea	Papua New Guinea Sovereign Wealth Fund	n.a.	2011	Gas	n.a.
Qatar	Qatar Investment Authority	100	2005	Oil	5
Russia	National Welfare Fund	149.7	2008	Oil	5
Saudi Arabia	SAMA Foreign Holdings	532.8	n.a.	Oil	4
Saudi Arabia	Public Investment Fund	5.3	2008	Oil	4
Trinidad & Tobago	Heritage and Stabilization Fund	2.9	2000	Oil	8

UAE – Abu Dhabi	Abu Dhabi Investment Authority	627	1976	Oil	5
UAE – Abu Dhabi	International Petroleum Investment Company	65.3	1984	Oil	9
UAE – Abu Dhabi	Mubadala Development Company	48.2	2002	Oil	10
UAE – Abu Dhabi	Abu Dhabi Investment Council	n.a.	2007	Oil	n.a.
UAE – Dubai	Investment Corporation of Dubai	70	2006	Oil	4
UAE – Federal	Emirates Investment Authority	n.a.	2007	Oil	2
UAE – Ras Al Khaimah	RAK Investment Authority	1.2	2005	Oil	3
US – Alabama	Alabama Trust Fund	2.5	1985	Oil and Gas	n.a.
US – Alaska	Alaska Permanent Fund	40.3	1976	Oil	10
US – North Dakota	North Dakota Legacy Fund	0.1	2011	Oil and Gas	n.a.
US – Texas	Texas Permanent School Fund	24.4	1854	Oil and Other	n.a.
US – Wyoming	Permanent Wyoming Mineral Trust Fund	4.7	1974	Minerals	9
Venezuela	FEM	0.8	1998	Oil	1

Source: The Sovereign Wealth Fund Institute, www.swfinstitute.org/fund-rankings/.

Note: GDP = gross domestic product; GOSS = Government of Southern Sudan.

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