CHAPTER 10

Ownership, Management, and Revenue Sharing of Petroleum Resources in Federal and Devolved Regimes

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Introduction

Petroleum is the most politicized of all natural resources, so it should come as no surprise that issues around the ownership, management, and benefit sharing of petroleum resources are contentious and complex in federations with significant endowments of petroleum. Experts in fiscal federalism have developed principles to address these issues; however, the practice across federations of handling them is highly varied and shows little adherence to any set of coherent principles. This chapter will present an overview of several principled arguments regarding the appropriate arrangements for petroleum in federal systems and the experiences of a number of federations and quasi-federations that have significant petroleum resources.

This chapter is divided into three major sections, corresponding to the three central questions of ownership, management, and revenue sharing. Each section will consider the normative principles and other factors that might guide a federation's choice of arrangements for petroleum. Although some "best practices" exist, there is no single best way to deal with petroleum in a federal or a devolved context. Much will depend on the nature of and the relative importance of the

resource as well as on the character of the political regime and society. In actual practice, a central theme is that ownership, management, and revenue-sharing arrangements within federations and devolved countries often relate to one another in surprising ways—the order of government that owns the resource may not necessarily manage the resource, and, similarly, the allocation of fiscal benefits may not necessarily follow from either ownership or management of the resource. Each of these dimensions has a good deal of potential autonomy, and therefore, each dimension merits careful consideration—as does the interrelation of the dimensions.

A federation is frequently defined as "a system of government in which there are two (sometimes three) constitutionally established orders of government, each of which acts directly on its citizens and has some genuine autonomy from the other."[1] Historically, the older, "classic" federations were largely built around a dualist model in which the division of powers was characterized by a significant number of exclusive powers for each order of government and in which it was assumed that each order would operate independently of the other. This dualist model has been contrasted with what is sometimes called "integrated" (or even "administrative") federalism, which features a good deal of sharing of powers, typically with the federal government allowed to impose its laws in areas of concurrency. Although there is some reality to the distinction between these two types of federations, we shall see that all federations have become integrated to a substantial extent.

It is also worth noting that there are nonfederal arrangements for the devolution of political powers. For example, in unitary regimes, devolution is normally carried out through legislation rather than through the constitution, leaving the legal autonomy of regional governments theoretically less guaranteed. In practice, some so-called unitary regimes devolve more authority than some federal regimes, and even though this devolution is enacted by simple legislation, the politics of the country might be very protective of regional prerogatives. There are also asymmetric regimes in which one region (or a few regions) have special devolutionary arrangements—and these arrangements may or may not be supported by constitutional language. Thus, it is reasonable to avoid too narrow an approach in this discussion and include some quasi-federal and asymmetric regimes when relevant.

This chapter will show that few federations have provisions for truly sharing the management of the petroleum sector—usually, one order of a government is clearly in the lead, although there may be arrangements for some "jointness" on certain aspects of petroleum policy or management. By contrast, arrangements for sharing petroleum revenues between the orders of a government and among the producing and nonproducing constituent units of the federation are common, although the manner, justification, and extent of this sharing varies greatly. It seems that money is easier to share than management.

Ownership

Although the *ownership* of petroleum resources can be a highly emotive political issue, the language associated with it and the practical significance of such language vary substantially across federations. Even where the constituent units of a federation have ownership of petroleum resources on land, the offshore resources

are under federal constitutional jurisdiction because the offshore (or almost all of it) is deemed to be outside the territory of the constituent units. The allocation of management and fiscal powers regarding petroleum resources are of fundamental importance, and so the technical ownership of petroleum resources can be of minor importance when management and fiscal powers are in the hands of another government. Even when governments issue rights of various kinds to oil companies, governments keep ownership of the subsurface resource. Private ownership of petroleum is most often tied to resources that have been produced (though in much of the United States and for some lands in Canada, private ownership of the surface lands extends to subterranean resources).

Because petroleum is such a valuable resource, there can be heated political and legal debates around the question of "Whose oil is it?" and what the answer signifies in practice. Some federal constitutions assign the ownership of petroleum to one or the other order of government (or to both orders jointly), but other constitutions never use the term *ownership* (or similar terms). Moreover, when it is used, the term has different meanings in different contexts, and the constitutional assignment of ownership can be contested politically. More fundamental than the use of the term *ownership*, however, are the rights and duties that a particular government, private individual, or collective has in relation to something, whether it is a resource, land, a building, a corporation, or intellectual property.

Constitutional Language Relating to Ownership

A number of federal constitutions are explicit regarding the ownership of petroleum resources:

- Canada: "owner rights to nonrenewable natural resources are vested with the provinces" (Art. 92a).
- India: "states own all the land and natural resources in their territory" (Art. 294).
- Iraq: "oil and gas are owned by all the people of Iraq in all the regions and governorates" (Art. 111).
- Mexico: "all natural resources in national territory are property of the nation" (Art. 27).
- Nigeria: "federal proprietorship" of minerals, mineral oil, and natural gas is affirmed (Sec. 44.3).
- República Bolivariana de Venezuela: all hydrocarbons "belong to the Republic" (Art. 12).

Other constitutions imply ownership without using the term, employing language such as *vesting*, *dominion*, *prerogative authorities*, and *powers*:

- Argentina: "provinces have the original dominion over the natural resources existing in their territory" (Art. 124).
- Bolivia: the central government has "prerogative authorities" in relation to hydrocarbons and land policy (Art. 298) and "control and direction over the exploration, exploitation, industrialization, transport, and commercialization of natural resources" (Art. 351).

- Indonesia: "the land, the water, and the natural resources . . . shall be under the powers of the State and shall be used to the greatest benefit of the people" (Art 33.3).
- Kenya: all minerals and mineral oils "vest in the national government" (Art. 62).
- Pakistan: oil and gas within a province or its adjacent territorial waters "vest equally in that province and the federal government," while offshore they "vest in the federal government" (Art. 172.3).
- Russian Federation: natural resources may be subject to private, state, municipal, and other forms of ownership (Art. 9), and their use shall be a joint jurisdiction of the federal and constituent unit governments, subject to the supremacy of federal law (Arts. 72 and 76).

Still other constitutions have no language tied to ownership or property:

- The United States and the Australian constitutions make no direct reference to ownership or control of onshore resources. In both cases, these federations were formed from former colonies "coming together" into a federal union, and their constitutions assign any subjects not explicitly assigned to the federal government to the states through the "residual" power. In Australia, the states passed laws more than 100 years ago declaring their ownership of subsurface resources, and "the Australian constitution does not disturb this position" (Crommelin 2012), even though it is silent on the matter. In the United States, subsurface ownership follows surface ownership, whether private or public, and large parts of the western states are still federal lands (that were never transferred as new states were created) with federal ownership of the subsurface.
- Malaysia's List 2 of state-exclusive competences includes licenses and leases for mines, which has always been interpreted to signify resource "ownership" by states (although this provision was circumvented in due course, as discussed in the following section).
- Natural resource ownership was a very contentious topic in the negotiations of the Comprehensive Peace Agreement (CPA) in Sudan in 2005. It was finally agreed that both the CPA and the interim constitution would be silent on the matter, with the provisions relating to petroleum being limited to management and revenue-sharing arrangements (Haysom and Kane 2009).

Offshore Ownership and Federal Lands

The distinction between onshore and offshore is important in most federations. Typically, the maritime boundaries of constituent units within federations are deemed to end at the low-water mark, and so their jurisdiction does not extend into the offshore zone, which falls under federal authority. (Constituent units' territory extends partially into the offshore in Argentina, peninsular Malaysia, Pakistan, and the United States, where it is deemed to include all or part of the adjacent territorial sea, which may extend as far as 12 nautical miles.) The territory of constituent units or their jurisdiction always excludes the Exclusive Economic Zone that extends to 200 nautical miles, or the edge of the continental

shelf (with the sole exception of Malaysia, where the Borneo states of Sarawak and Sabah are considered to include their offshore zones because they joined the Malaysian federation after the Law of the Sea Treaty had established their zones).

Although all or almost all of the offshore zone is typically under federal jurisdiction, constitutions tend to be silent on the issue of ownership of the zone and rarely use the language of ownership in relation to the country's Exclusive Economic Zone.

In federations in which most onshore production is controlled by constituent units, a federal government can use its control over the offshore zone and federal lands as an instrument of a broader petroleum policy. Thus, in the United States, the federal government's policy objectives on petroleum supply and markets have influenced the rate at which it has promoted activity on federal lands in the western states, Alaska, and offshore. In Canada, the federal government made an ill-fated attempt through its National Energy Program in the early 1980s to steer exploration away from provincially controlled areas and toward the federally controlled northern territories and offshore, but this move largely foundered as petroleum prices declined, and the policy was withdrawn after a change in government.

The Limited Significance of Ownership Language

Regardless of the language used around ownership, more important is the allocation of powers or responsibilities regarding the management of petroleum and the allocation of petroleum revenues. Management responsibilities and the allocation of benefits from petroleum revenues do not necessarily follow from ownership. For onshore resources in countries such as India, Malaysia, Pakistan, and Russia, the primary management responsibility is with the federal government, even though the states own the resource in the first two cases and there is joint ownership in the latter two. Iraq's constitution of 2005 famously failed to resolve the fundamentals of oil management, despite the clause on ownership (Art. 111) cited above. As for revenue sharing, the major fiscal revenues flowing from petroleum resources go to the federal government in India, Malaysia, and Russia, despite constituent-unit or joint ownership. Meanwhile, in Brazil, most petroleum revenues flow to the states and municipalities despite federal ownership (although the share flowing to producing states relative to that of other states and municipalities has recently been reduced).

Constitutions establish a fundamental framework for petroleum arrangements in most federations, but they can be amended to reflect changing circumstances. For example, Pakistan in 2010 passed the 18th amendment to its constitution, which represented a potential empowerment of the provinces (though this is still contested) and included a new clause that established joint ownership of petroleum resources within provincial boundaries. Similarly, Canadian provinces' powers over natural resources were strengthened as part of the major constitutional reforms in 1982 (Howlett 1991). Perhaps the most extraordinary change was in Malaysia, where in 1974 the federal government introduced the *Petroleum Development Act,* which gave full ownership rights of petroleum resources in the country to the newly established state oil company, Petronas. The company was placed under the direct control of the prime

[[AQ: In sentence beginning "For example, Pakistan"- What is still contested? The amendment or whether it has empowered the provinces? Clarify.]]

minister, even though the constitution stated (and still states) that petroleum resources within states "belong" to them. The implementation of this act required, in a politically controversial measure, that the states transfer ownership and all exploration and production rights to Petronas in exchange for a 5 percent royalty on production within their territory. Moreover, the act states that the ownership and the exclusive rights and powers of Petronas "shall be irrevocable" (Art. 2.3).

Australia's, Canada's, and Nigeria's supreme courts all confirmed that the offshore zone lay beyond the boundaries of the constituent units and therefore was entirely within federal jurisdiction. But in each case, the federal government reached political compromises to accommodate constituent units adjacent to the offshore zone. In Australia, the states were ceded ownership and management of the "coastal waters" within three miles of the shore and given a subordinate role in joint management for the offshore zone. In Canada, the provinces were given equal powers within a joint management arrangement and were allowed to benefit from offshore petroleum revenues as if they were onshore. In Nigeria, the coastal states were able to win revenues from much of the offshore petroleum on the same "derivation" basis as operated onshore.

The United States has a particularly complex pattern of petroleum ownership, in that there are extensive federal lands onshore, notably in the western states and Alaska, while the territory of coastal states extends partway into the territorial sea. In most cases, subsurface rights in the United States belong to the owner of the surface land, which may be a government but is often a private individual or company (whereas private ownership of subsurface resources is relatively rare in other countries).[2] Over time, the federal government has made various arrangements with the states regarding management of petroleum and sharing of petroleum revenues from federal lands—50 percent of which now accrue directly to the producing state, while a further 40 percent accrues to a special reclamation fund for 17 western states—while maintaining federal ownership. Recently, the revenue-sharing terms for the offshore Gulf of Mexico petroleum were made substantially more generous for the adjacent states.

Ownership, Concession, and Contracts

Governments may transfer to corporations or other legal parties various rights and obligations regarding the exploration for and the potential development of petroleum resources. The legal instruments for these arrangements fall into two broad categories: concessionary systems and contractual systems. The fundamental difference between the two relates to the ownership of the natural resources:

- Under a concessionary system, the title to the hydrocarbons passes to the investor at the borehole. The state receives royalties and taxes in compensation for the use of the resource by the investor.
- Under a contractual system, the investor acquires the ownership of its share of production only at the delivery point (Tordo 2007, 7–8).

In both cases, the state does not transfer ownership of the subsurface resource; rather, it issues rights in relation to the management and development of the resource.

For the most part, issues around a government's technical ownership of the resource in the ground have not complicated relations with private investors. However, in Mexico, the former provisions of the constitution, which established the country's "direct ownership" of petroleum as "inalienable and essential," were deemed to preclude either concessionary or contractual arrangements whereby a company would have an eventual claim on a share of the petroleum that was produced. These provisions excluded international oil companies (IOCs) from acquiring concessions, risk, and incentive contracts, which over time had severe implications for the availability of investment capital and specialized technology for the development of Mexico's petroleum industry. In 2013, the constitution was amended to state that "All natural resources . . . are the property of the nation, and private exploitation may only be carried out through concessions" (Art. 27). This reform enabled a major opening of Mexico's petroleum sector, attracting many billions of dollars in planned investment. The language captures the general distinction between the ownership of the resource, which remains with the government, and the limited rights of concession holders.

Management

The key management instruments for the petroleum sector concern the issuance of rights and licenses to explore and develop the resource. While this authority may rest with the order of government in a federation that has ownership of the resource, this is frequently not the case. In general, the federal or central government has control of petroleum rights in developing-country federations, but in older federations, the constituent units have both ownership and rights management onshore. Federal governments typically manage the offshore zone, although there are some joint management arrangements. Several constitutional powers aside from rights management can also affect the management of the petroleum sector, including taxation and revenue-raising powers, as well as regulatory powers over the environment, petroleum marketing, and transportation. In federations with decentralized rights management, federal governments have sometimes used these other powers to exercise a substantial influence on the development of the sector. By contrast, in federations with centralized rights management, the constituent units typically have very limited powers of this type to influence management of the sector.

The petroleum industry's technical complexity, its potential environmental and social impacts, and its economic and political importance make it very challenging for governments to manage effectively, especially in developing countries, which may have limited technical capacity and a heavy reliance on the resource. Although significant petroleum resources can be a major asset for a country if they are managed well, too often oil wealth has led to corruption, divisive politics, and poor economic policies—the notorious "oil curse."

Managing oil within a federal context can be even more challenging than in unitary regimes because of the conflicts between governments over major decisions regarding exploration and development and over the distribution of benefits. Even though one order of government normally has the lead on petroleum policy and operations in a federal regime—there are relatively few instances

of truly "joint" management by federal and constituent unit governments—some federations give the constituent units a clear lead responsibility for managing the onshore operations of the industry but give the federal government important policy, fiscal, and regulatory powers as well. The opposite does not apply: constituent unit governments typically have very limited instruments for influencing the sector when it is under federal management. This section looks at the various legal authorities that governments and federal and constituent units use to influence the management of the petroleum industry.

The legal regime governing petroleum exploration and production normally deals with the following major issues:

- Hydrocarbon rights and their use
- Revenue matters, including taxation
- Environmental protection
- Petroleum transport and marketing

Although it is possible—and in some ways desirable—to have an integrated legal regime in which the hydrocarbon law deals with all of these issues or incorporates other laws by reference, this is frequently not practiced or possible within federations, mainly because both orders of government may have distinct powers relevant to hydrocarbons. Discussions of oil and gas management often focus on hydrocarbon rights and their use—with the government controlling these rights as the "manager"—but in practice, laws and regulations relating to all four of the above issues may affect the nature and pace of petroleum activity within a country. Therefore, it is useful to adopt a broader approach to management—one that includes all of the key instruments that may be used.

Much of the normative literature on petroleum management focuses on sector-specific objectives such as efficiency and effectiveness as well as on managing the fiscal impacts of petroleum revenues. However, the management of the petroleum sector must also be examined within the broader political and economic context of a federation. The objectives of the federal government and of the governments of both petroleum-producing and other constituent units may differ on a host of questions relating to economic management, industrial policy, environmental objectives, and the distribution of the petroleum sector's fiscal and other material benefits. Thus, in a federation in which the constituent units play the lead role in managing oil and gas, the federal government may have important concerns about its access to petroleum revenues; the impact of oil price booms and busts on the economy; balanced regional and sectoral development, as well as horizontal fiscal balance between constituent units; "energy security"; and environmental protection. Where a federal government plays the lead role in managing oil and gas, the constituent units—producing and nonproducing—will still have concerns about the sharing of revenues, local job and industrial opportunities, and social and environmental impacts. Thus, there is a need, especially in federations, to take a broad view of oil and gas management as something that takes place in the context of multiple governments pursuing multiple and often conflicting objectives.

This section will review the four major issues with a focus on the role of each issue in petroleum management, especially within federal systems.

The Core of Petroleum Management: Rights and Their Use

The core of any oil and gas regime is the law, or set of laws, that establishes the principles and the approach to allocating exploration and development rights for the resource, including penalties and fines for mishandling this development, approvals needed for particular operations, the relevant administrative machinery, and economic and fiscal guidelines for investment activity (Ororato 1995). Although such laws are usually thought to be the prerogative of the government that "owns" the resource (Boadway and Shah 2009), in some federations, the federal government is given the constitutional authority to manage the resource and, hence, the legislative authority for oil and gas rights, even though it is not the owner or sole owner.

In most federations, the order of government responsible for legislating oil and gas rights—whether federal or constituent unit—does so without any involvement by the other order of government. Thus, for onshore resources in Argentina, Australia, Canada, and the United States, the constituent units pass and administer their petroleum laws independently of the federal government, while in Brazil, India, Malaysia, Mexico, Nigeria, Pakistan, Russia, and the República Bolivariana de Venezuela, the federal governments act autonomously from the constituent units in passing and administering their petroleum laws. The responsible government can administer its petroleum law through different structures. Frequently, this administration is done by a government department (such as an oil ministry), but another popular model is to have a separate regulator or agency engage in day-to-day administration while the ministry is responsible for overall policy and legislation. In a few countries, such as Malaysia, the management of the petroleum sector has been delegated to the national oil company (NOC), which combines the responsibilities of regulator and operator.

There are a few instances in federal regimes in which the government responsible for the petroleum law does involve the other order of government in the preparation of the law or in its administration, but the extent of such involvement tends to be limited.

- In India, the constitution provides that only the federal parliament may make laws relating to oil and gas. However, national legislation does permit the states, which constitutionally own the resource, to grant exploration licenses and development leases, so long as those leases strictly adhere to the central rules. Thus, the states have very limited decision making in this area.
- In Pakistan, the federal government has clear responsibility to control and manage the petroleum sector (even though petroleum is jointly owned with the provinces), but the federal powers fall under a section of the constitution that requires, since 2010, the federal government to involve the Council of Common Interests (CCI)—a forum of federal and provincial leaders—in the formulation of regulatory policies. This body tries to operate through consensus, but in the event of disagreement, an item can pass with the approval of the federal government and one provincial government. If no provincial government agrees with a federal proposal, the matter can be referred to a joint sitting of the two houses of the federal parliament, which are empowered to issue directives to the CCI. Since 2010, the CCI has been involved in approving petroleum policies as well as in the award of exploration blocks, but the

influence of the provinces has been limited (Ahmed 2012), and little new activity has been approved.

- In the United States, Congress has the right to regulate oil and gas activities on federal lands within the states, but the states assume concurrent jurisdiction, which means that they can also regulate in these cases so long as their regulations do not contravene federal law. In certain cases, the federal government can preempt state laws from applying. Congress may also deal with state or local regulations on a case-by-case basis, accepting or refusing them, and federal laws require that various federal regulatory provisions be consistent with the laws of a state and with state plans. Historically, the federal government has cooperated with states on issues such as well spacing and the rate of development and production. These accommodations have been reached politically and have not been imposed by the constitution (Mieszkowski and Soligo 2012).
- In Argentina, until 1992 the federal government administered oil and gas rights in the provinces that had been created from federal territories in the 1950s. In 1994, a constitutional amendment gave all provinces control of the oil and gas rights within their territory, but the federal government preserved a significant role in many operations because of its ownership of the NOC, Yacimientos Petrolíferos Fiscales (YPF), which held extensive rights granted to it by the federal government. These rights will expire over time.

In the first three of these cases, the federal government has primary control of onshore petroleum rights while the constituent units have a very limited role in determining and administering the petroleum law. In Argentina, the federal government has, for a transitional period, an indirect management role through its ownership of YPF in a regime in which the provinces control petroleum rights.

The most robust models of "joint administration" of petroleum rights between governments are found in the offshore regimes of Australia and Canada. In both cases, the countries' supreme courts had ruled that the offshore zone fell under the jurisdiction of the federal government, but the federal governments chose to negotiate joint arrangements with the constituent units concerning this zone.

- In Australia, the commonwealth and state governments negotiated the Offshore Constitutional Settlement in 1979. Although the commonwealth government retained ultimate constitutional authority, it delegated legislative authority for the area within the three-mile limit of the territorial sea to the adjacent states, and it set up a joint regime for the rest of the offshore zone. For the larger offshore area, it passed legislation assigning day-to-day administration of each state's offshore area to a "designated authority" (a state minister and officials). It also created a "joint authority" of the federal and state ministers for each area to be responsible for major decisions, such as which areas should be open for petroleum activity, the granting of exploration and production rights, and the determination of work and investment conditions. In situations in which the two ministers cannot agree, the federal minister has the ultimate power to decide (Commonwealth of Australia 1980).
- In Canada in the early 1980s, the federal government negotiated offshore agreements with Nova Scotia and Newfoundland. These agreements were

inspired by the Australian model, but had significant differences. The day-to-day administration of each offshore area is assigned to an arm's-length agency whose board is made up of equal numbers of federal and provincial nominees and a mutually agreed-upon chair. Certain decisions, similar to the major decisions in Australia, are deemed "fundamental" and require the agreement of both ministers, but there is no federal ability to override (Cairns 1992).

Neither of these models is fully joint, in the sense that all decisions are made jointly by the two relevant governments. In both cases, legislation is federal and day-to-day administration is delegated to a state minister (in Australia) and to an arm's-length agency (in Canada). For fundamental decisions, the Canadian model demonstrates joint decision making, while the Australian model preserves the ultimate right to decide of the federal minister (although consensus is the normal objective and practice). It is also worth noting that these models apply to the offshore zone, where the scale of individual operations is typically much larger, and thus the key decisions are fewer, than is usually the case onshore. Adapting such a model to an onshore context could pose distinct challenges.

There was some consideration of a joint regime in Iraq. The country's constitution stipulates that the federal government and the governments of the producing governorates and regions are "to undertake the management of oil and gas extracted from present fields" and that these governments "shall together formulate the necessary strategic policies to develop the oil and gas wealth" (Art. 112). In neither case, however, was the language clear. In December 2014, the two governments reached an agreement in which the Kurdish Regional Government (KRG), which has controlled petroleum activities in its area, committed to providing significant quantities of oil to the State Oil Marketing Organization of the federal government; in turn, the KRG received significant fiscal concessions and perhaps implicit recognition of its oil production exceeding the amounts to be delivered to the federal government (Knights 2014). However, in September 2017, the KRG held a referendum on independence, in which the vote was strongly in favor. This led to a crackdown on the KRG by Baghdad, which included the retaking of Kirkuk, a key oil producer, and a reduction in fiscal revenues for the KRG. In the spring of 2018, the Iraqi Parliament, after many years of fruitless debate over a new petroleum law, passed a law for the creation of the Iraq National Oil Company that would centralize petroleum management in the national oil company. Although this law was supported by Kurdish members of parliament, it leaves unresolved a number of major issues regarding the division of petroleum management and revenues between the federal government and the KRG.

Fiscal Levies on Petroleum as a Management Instrument

The cost of finding and producing petroleum is often substantially less than the price paid for it. This discrepancy gives governments a strong interest in the fiscal regime governing the petroleum sector because of the substantial revenues that may flow to them. In fact, it may be argued that for most governments, optimizing their fiscal take is their primary objective in relation to the petroleum sector—but even this objective involves judgments and preferences related to the timing of revenue flows and other factors. Fiscal levies may be established

through royalties, resource rent taxes, corporate income taxes, import and export duties, value added taxes (VATs), bonuses, government participation, profit oil, and other instruments. Typically, such levies are relatively transparent when they apply to private investors, but many governments that make heavy use of their national oil companies have extracted revenues from their NOCs on a highly discretionary and nontransparent basis.

In almost all federations, the order of government that is directly responsible for administering the petroleum sector (which may or may not "own" the resource) also determines the principal fiscal levies on the sector. However, deciding what the fiscal levies will be is different from determining the allocation of the petroleum revenues, as is discussed in the following section on revenue sharing. The purpose of this discussion is neither to consider the merits of different levies nor to consider the optimal design of a petroleum fiscal regime, which are both addressed in Chapter 4 of this publication (see also Cottarelli 2012, Tordo 2007). The purpose of this section is, rather, to consider the role that fiscal levies can play in the management of the petroleum sector and what this role may mean, given the distribution of fiscal responsibilities within federal systems.

There seems to be a general pattern that in federations where the federal government manages hydrocarbon rights and their use, it also determines all—or virtually all—of the fiscal terms in the petroleum industry. Thus, in Brazil, Malaysia, Mexico, Nigeria, Pakistan, Russia, and the República Bolivariana de Venezuela, the constituent units have no say regarding fiscal levies on the industry, or have only very limited powers. In some cases, constituent unit taxes of general application, such as a VAT, cover the petroleum industry. But even in those cases, as in Brazil, the federal government may have the authority to establish complementary laws, which set the basic rules for a particular tax by a constituent unit (Rezende 2007). In the República Bolivariana de Venezuela, states have been able to tax nonoperational contractors serving the oil industry on the same basis as other industries, and this has been a very modest source of revenue for a few producing states (Manzano and others 2012). States in India can levy charges on the petroleum industry at various stages of development and can collect some fees levied by the federal government. However, these fees are minor (Noronha and Srivastava 2012), so they are unlikely to affect the character, pace, or management of petroleum activities.

In contrast to the very limited powers of constituent units over petroleum management in federations where the federal government controls rights, in states where the constituent units control rights, federal governments do have a number of potentially substantial fiscal powers that can be—and have been—used to affect the pace and character of petroleum development, as well as to achieve the federal governments' broader revenue-raising and other purposes. Argentina is, perhaps, the most dramatic recent example: although the provinces administer the petroleum sector and have the right to impose and collect royalties along with various other taxes on it, from 2002 to 2017, the federal government used its power to tax hydrocarbon exports (and its power to impose export and import controls) to extract twice as much in petroleum revenue as the provinces did with royalties. The federal use of this instrument had a major depressive influence on the sector, both because of the weight of fiscal take and

because it forced the internal price for oil and gas below international levels (and thereby reduced the value of royalties received by the provinces). Although the federal government's motives were fiscal rather than sector-related, its intervention shows how dramatically a fiscal instrument can affect activity in the petroleum sector.

After the second international oil shock in 1979, the Canadian federal government intervened to change the nature and the course of the country's petroleum sector by implementing the National Energy Program (NEP). The NEP was a far-reaching scheme to redistribute government revenues from petroleum, protect consumers from world oil prices, and promote much greater petroleum activity in the offshore zone and in northern lands that were under direct federal jurisdiction. The Canadian provinces controlled petroleum rights; therefore, the NEP relied heavily on fiscal instruments, including an export and a petroleum and gas revenue tax, changes in corporate taxation, and incentive payments for exploration on lands under federal jurisdiction. Although the NEP foundered on domestic politics and falling oil prices, it demonstrates how powerful federal revenue authority can be as an instrument to affect the management of the sector in a federation where constituent units control petroleum rights within their boundaries. More recently, in 1997, the Canadian federal government intervened to accelerate the development of the huge oil sands resource in Alberta by providing special cost allowances against corporate income tax; these allowances are now being phased out.

Energy security has long been a preoccupation of governments of the United States; as a result, the federal government has a history of issuing "supply-side preferences" that have given special incentives to the petroleum industry to favor its development. These incentives have included special deductions for certain expenses as well as a generous depletion allowance. Estimates of total federal tax preferences for the petroleum industry in 2009 range from about US$3 billion to US$6 billion (Mieszkowski and Soligo 2012, 325–26).

Environmental Regulation of the Petroleum Sector

All countries with petroleum industries will proclaim their commitment to safety and environmental protection. However, in practice, the extent of this commitment varies greatly, and there are many stories of terrible industry practice and inadequate government regulation. Environmental regulation is an intrinsic part of the responsibility of oil and gas regulators, but when these regulators are the oil ministry, a special oil regulatory agency, or, worse, an NOC, there is an inevitable conflict among their various responsibilities. Strict environmental compliance can add costs and delays and thus hurt government revenues and exports; as a result, environmental standards may be compromised. These internal conflicts and compromises are mitigated by many governments through the enactment of a strong environmental law and a ministry that establishes standards that apply to all industries, including the petroleum industry. In some cases, the implementation of these standards is assigned to the petroleum regulator (with greater or lesser oversight by the environmental authorities). In other cases, the environmental department or agency has hands-on responsibility for regulating the petroleum industry in the field.

Inevitably, the story becomes more complicated in federal systems. When the petroleum regulator is within one order of government (federal or constituent unit), the question is whether the industry is subject to some degree to environmental regulation by the other order of government. The answer has some similarity to the regulation of fiscal levies, in that when the petroleum regulator is federal, the constituent units typically have weak (or even no) regulatory authority over environmental impacts of the industry. When the petroleum regulator is at the constituent unit level, the federal government usually has considerable legal authority over the environmental impacts of the petroleum industry. And in all cases, the actual outcomes depend on political will and priorities as well as on the ability of the public to bring effective pressure to bear.

An extreme example of local environmental disempowerment when the federal government is the petroleum regulator is Nigeria. Its states and local communities "have no constitutional or statutory rights, voice, or even consent regarding oil and gas industry projects in their locale." This "total exclusion" from participation in the local industry has "combined with the environmental, socioeconomic, and political deprivations of the region to engender the militant campaign for regional and local 'resource control' in the Delta" (Iledare and Suberu 2012). The República Bolivariana de Venezuela is in a similar situation.

In most other federations with centralized oil and gas rights management, the constituent units have some (limited) role in environmental regulation of the industry. In Malaysia, Sarawak seems to have won political consent to its requirement, which has a dubious legal basis, for environmental impact assessments on certain activities (Hui 2012, 182–83). In Mexico, local governments have very limited legal powers, but they have become increasingly effective in bringing political pressures to bear on Pemex to comply with environmental regulations (Carreon-Rodriguez and Rosellon 2012, 218). In Brazil, the federal government has exclusive rights over the exploitation of natural resources, but the environment is an area of concurrent competence, with federal power to override. In practice, the Brazilian states seem to have little role in regulating the environmental impacts of petroleum activities, although they can use various consultative mechanisms. Subnational governments in India and Pakistan have somewhat stronger legal responsibilities for environmental regulation that bears on the petroleum industry. In Pakistan, provinces regulate major field operations comprising seismic surveys and drilling, which cannot proceed without an environmental assessment and a no-objection certificate (Ahmed 2012, 277). The Indian constitution has no heading for the environment, but the subject is captured within several other issues, such as water and land, which are largely state matters, and forests, which are concurrently regulated. In general, the Indian central government has the advantage because it controls so much framework legislation, but the states also have a role in administration. Much of the environmental debate regarding the petroleum sector in India relates to inadequate compensation for environmental damage. A few states in the northeast with large tribal populations have been given special status and control over land and natural resources in response to compensation demands.

The situation is quite different in federations in which the constituent units manage petroleum rights. In these cases, the federal government has strong environmental powers, which can impinge directly on the oil sector.

Australia, Canada, and the United States all have very old constitutions in which there is no explicit mention of the environment, but the federal governments have recourse to other powers that permit them to establish environmental standards of virtually all kinds. The Argentine constitution was amended in 1994 to include a new provision (Art. 41) that establishes the right of all inhabitants "to a healthful, balanced environment" and that makes environmental regulation a concurrent responsibility of the federal government and the provincial governments, with the federal laws paramount. All four of these federations have high environmental standards, in which the federal government has usually taken the lead, and have seen substantial coordination, including delegation by the federal governments of some regulatory responsibilities to state or provincial authorities.

While federal environmental regulations have not been designed explicitly to influence the pace or nature of petroleum activities, they have sometimes had this effect because of requirements for extensive environmental review prior to approval of projects or for costly damage-mitigation measures. In these federations, the federal governments also have the power to impose a carbon-pricing regime—whether a carbon tax or cap-and-trade—which could have a substantial impact on the petroleum industry, but so far, only Canada has made initial steps in this direction.

Petroleum Transport and Marketing

The final major area where there can be aspects of "jointness" in managing the petroleum sector relates to the transport and marketing of petroleum once it is out of the ground. In federations where the constituent units manage petroleum rights, the federal government powers related to transportation and marketing can have a major impact on the petroleum sector and can be used as a major lever by which federal governments influence petroleum policy, even though they do not manage most rights. Such federal powers can be used to promote the development of the sector or to constrain it.

In the United States in the 1930s, oil prices dropped below US$0.10 a barrel—well under the cost of production—because of a flood in production following huge discoveries in Texas and Oklahoma. Texas moved to proration production as a way to increase prices, but its efforts were undermined by so-called hot oil, which was oil production that exceeded legally allowable quotas. The state's attempts to raise prices largely failed. Chaos ensued in the industry, so the federal government eventually stepped in to prohibit the sale of hot oil across state boundaries and suggested appropriate production levels to different states. It also imposed an import duty on foreign oil. Together, these measures raised prices and stabilized the industry (Yergin 1991, 248–59). In the 1950s, the federal government established a limit on oil imports, which resulted in domestic oil prices at least 50 percent higher than import prices. These limits were eliminated in the 1970s after the first oil-price shock, when the federal government brought in price controls. The federal government also had authority over interstate pipelines, and, in the case of natural gas, it actually regulated wellhead prices of gas destined for interstate commerce (Mieszkowski and Soligo 2012, 313–16).[3]

In Canada, the federal government also intervened in the 1950s to promote the country's nascent oil industry by supporting the development of the

Trans-Canada natural gas pipeline and by reserving domestic oil markets west of a line near the Ontario-Quebec border for Canadian supply. It thereby boosted prices for western oil producers. However, after the oil price shock in 1974, federal policy shifted toward security of supply and protecting consumers, which was implemented by restricting exports and controlling oil prices outside the province of production. Export restrictions were tightened further as part of a broad range of federal measures, including a tax on oil exports following the second oil shock (Plourde 2012, 90–94). While Canadian policy is now essentially market driven, there have been growing claims by aboriginal people and provincial governments to have some control over and to receive benefit from pipelines that cross their territory. The position of aborigines has been strengthened by the country's supreme court's ruling that the aborigines have a right to be consulted about pipelines—which means they must be seriously considered and accommodated where reasonably possible. In practice, this enables them to gain material benefits. The province of British Columbia argues that it should receive material benefit from a pipeline traversing its territory, in part because it assumes the environmental risks associated with the pipeline. Both of these developments are altering the context in which the federal government regulates major pipelines. In August 2018, a court found that the approvals given by the federal government for the Trans Mountain pipeline from Alberta to the British Columbia coast were deficient in relation to environmental impacts and consultations with aboriginal peoples, so the federal government was obliged to conduct a new round of consultations and studies. The oil industry in Alberta has been increasingly concerned that barriers to completing major pipeline projects are having a serious impact on its ability to get oil to markets and on the price it can get for the oil it produces.

Additional examples of marketing controls include the aggressive interventions by the previous Argentine federal government through export quotas on natural gas, restrictions on the use of natural gas for electricity, and very high export taxes on both oil and natural gas. The Australian government has similar constitutional powers that would permit it to control exports and internal prices and to impose export taxes, but it has not used them to intervene in this way. Finally, the Iraqi government was able to use its leverage over the marketing of oil exports to reach a major agreement with the KRG on marketing and fiscal matters, as discussed earlier.

These examples illustrate how strongly federal powers over markets, exports, and transportation can affect the petroleum industry even in federations where the constituent units are responsible for managing petroleum rights. These federal powers, along with federal taxing powers and, in some cases, control of offshore and federal lands, have been the main instruments used by federal governments to influence petroleum policy at the national level. Their use has involved both cooperation and conflict with producing constituent units (as well as with nonproducing ones).

The Petroleum Management Nexus in Federations

This brief review was designed to give a sense of the different management arrangements for petroleum within federations. Management has been defined broadly to include all those powers or levers that might be used by a government—whether federal or of a constituent unit—to influence petroleum policy

and activity. Clearly, the allocation of the core responsibility for managing petroleum rights and their use is fundamental in any federal regime. Its assignment may be to a government deemed to "own" the resource, but this is not necessarily the case. In addition, we have seen that other powers or responsibilities can influence the management of the sector. The overall picture that emerges is one of strong contrasts between regimes where petroleum rights are managed by the federal government and regimes where the rights are managed by constituent unit governments.

- In the former, federal governments control virtually all the levers affecting the petroleum industry; although constituent units may have some limited fiscal or environmental powers that permit them to influence how the federal government manages the sector, these powers are typically quite limited, even in the most permissive cases. What matters most in those contexts is the political preparedness of the federal government to consult and cooperate with the constituent units.
- By contrast, when the constituent units control petroleum rights, federal governments still typically have considerable powers to affect petroleum policy: these powers include taxation and other fiscal instruments such as regulatory powers relating to the environment; transportation; internal markets; international trade; and sometimes the control of "federal" lands in the offshore, in federally managed territories, or within constituent units themselves. Thus, the dynamics around petroleum policy are much less one-sided in such scenarios, and each order of government has significant legal powers. This can lead to intergovernmental cooperation or conflict, depending on who controls each order of government and the nature of their objectives at the time.

Petroleum Revenue Sharing and the Fiscal Architecture of Federations

The importance of petroleum for the economies and government revenues of federations varies enormously. In some cases, petroleum revenues are the largest—even the dominant—source of government revenues. In all federations, federal governments determine a broad range of fiscal taxes and levies; they also collect more revenues than they need for their own purposes, and a portion of these revenues is allocated to the constituent units through a revenue-sharing formula, transfers from the federal budget, or both. Within the broader context of how governmental revenues are allocated, there can be special arrangements for sharing petroleum revenues. Each regime must determine the weight to be assigned to derivation (the jurisdiction where a revenue was generated) versus need in allocating revenues. Some regimes give significant weight to derivation for petroleum revenues, but the net effect of this weight can depend on whether the allocation of other revenues takes account of and offsets petroleum income of constituent unit governments. There are arguments for and against a special treatment for petroleum revenues, and these arguments may be resolved by finding an appropriate balance. Experience across federations in handling revenue sharing varies greatly.

A central feature of any federation is its fiscal architecture: which levels of government have what powers to raise what revenues, how revenues are distributed, and who has what expenditure responsibilities. These questions have both a vertical dimension—between the federal government and the constituent units—and a horizontal dimension—among the constituent units. Federations vary a great deal: in the extent to which revenues are raised centrally, in their procedures for allocating revenues, and in the distribution of expenditure responsibilities. In all federations, more revenue is raised centrally than is directly spent by the federal government, so there are arrangements for distributing some centrally raised revenue to the constituent unit governments (and even directly to local governments in some cases). Some federations, such as Malaysia, are highly centralized for both revenue raising and expenditure; several other federations are centralized for revenue raising but decentralized for government expenditures (which necessitates significant sharing or transfer of centrally raised funds); and a few federations have relatively balanced revenue-raising and expenditure responsibilities (necessitating relatively minor sharing or transfers).

- Oil and gas production can generate very large revenues for governments. In some oil-dependent economies, such as Nigeria and the República Bolivariana de Venezuela, petroleum levies can account for 80 or even 90 percent of all government revenues in the federation. Even in more diversified economies, such as Mexico and Russia, petroleum levies can be as much as half of all government revenues. Because the cost of developing petroleum is often only a small fraction of its price, governments can collect the normal taxes they would on any business plus the so-called *resource rent,* which is the potential profits beyond what investors would normally require. (The amount will vary according to factors such as geological and political risk.) In practice, few revenue regimes try to distinguish between resource rent and other revenues from the sector;[4] some governments have extremely simple regimes based on one kind of levy, while others invoke a whole bevy of fiscal instruments.

- In certain federations, all fiscal levies on petroleum are at the federal level; in others, both orders of government collect from the industry. It matters greatly who decides what charges there will be on the industry and what will be the distribution of petroleum revenues among the federal, constituent, and local governments. In fact, the distribution of petroleum revenues has been considered so important in Brazil, Nigeria, and Pakistan that the rules for their allocation are explicitly established in the countries' constitutions.

- The allocation of petroleum revenues needs to be considered in the broader context of the allocation of all revenues. Federations approach these allocation issues in very different ways. Some federations treat petroleum revenues as special; others do not. Some federations accept major disparities in the fiscal resources available to the governments of different constituent units; others try to equalize or at least limit disparities. Before looking in some detail at the varied approaches of federations to petroleum revenue sharing and management, it is important to set a broader context regarding the principles for allocating revenues.

Derivation versus Need, and Sharing versus Transfers

One principle for the allocation of revenues is *derivation*, which means that revenues (or some part of them) should be allocated to the political unit where they are generated. In federations where the constituent units have extensive revenue-raising powers of their own, the units typically keep the revenues that they raise;[5] thus, the devolution of taxing powers is implicitly tied to a notion of derivation. The story becomes more complicated when revenues are raised by the federal government. In this case, a good part of those revenues will be for the federal government's own expenditure needs and the territorial allocation of its expenditures will not necessarily reflect the territorial sources of its revenues. But in all federations, some part of federally raised revenues is allocated to the constituent unit governments (and sometimes to local governments, too). This can be done through two alternative methods called revenue sharing and intergovernmental transfers:

- *Revenue sharing.* This approach refers to the sharing of some or all federally collected revenues with the constituent units according to a set of rules. The rules establish which revenues are to be shared and which proportions are to go to the various constituent units. The revenues to be shared can be as inclusive as all federally collected revenues (as in India) or limited to the receipts from particular taxes and levies (as for petroleum revenues in Nigeria). Revenue sharing provides constituent units with unconditional lump-sum payments—in fact, in many federations the constituent units' allocations from shared revenues never appear in the federal budget. Rather, all the revenues to be shared among the federal and constituent unit governments go directly into a common national account (outside the federal budget) and from there are distributed to the various governments. Thus, such revenues are often considered *own source*, even when the constituent units have not determined or collected them.
- *Intergovernmental transfers.* The alternative to sharing all or certain federal revenues is for the federal government to vote to transfer funds from its budget to the constituent units. These transfers can be general-purpose and unconditional, like shared revenues, or they can be conditional, in that they are to be used by the constituent units for specific purposes subject to conditions. Conditional transfers may require some proportion of matching funds from the constituent units. These transfers provide an incentive for the constituent units to undertake programs that are federal priorities, although, in principle, the constituent units can decline to receive them (which rarely happens).

Some federations make use of both shared revenues and intergovernmental transfers.

The principles guiding allocations to constituent units for these two alternative methods have similarities and differences. Both methods can make unconditional transfers, and both can accommodate allocation formulas on the basis of various measures of need (for example, population size, own fiscal capacity, territorial size, or cost structure). But only the revenue-sharing method can make allocations on the basis of derivation, and only the intergovernmental transfer method can make conditional transfers.[6] In practice, the derivation principle in

revenue-sharing regimes seems always to be attached to the allocation of a particular revenue stream, not of all revenues. Thus, in India, which pools all federal revenues and then shares a portion of these revenues with the states, the principle of derivation has no bearing on the allocation. In Pakistan, however, the general revenue pool is shared without reference to derivation, but resource revenues, which are established and collected by the federal government, are kept out of the general revenue pool and are allocated to the provinces strictly on the basis of derivation.

Federations vary greatly in the extent to which constituent units are financed by revenues they generate themselves, by revenues that come through a sharing mechanism (from a general pool or particular revenue sources), and by intergovernmental transfers (unconditional or conditional) from the federal budget. In terms of the latter two categories, some federations, such as Nigeria, rely very heavily on revenue sharing; others, such as India, mix revenue sharing and intergovernmental transfers; still others, such as Canada and Mexico, have little to no revenue sharing and operate through intergovernmental transfers.

Every federation must find its own balance between the principles of derivation and of need. A justification for the derivation principle, when taxing powers are devolved, is that it provides an incentive for constituent units to make use of their powers to raise revenues for their own purposes. There is no such incentive when the federal government determines and collects the tax. When the derivation principle is applied, the justification for doing so seems to be that a particular tax somehow "belongs," at least in some degree, to the constituent units where it is collected. This relationship may be tied to ownership, notably in the case of natural resources, but the link is weak or nonexistent in many cases. Although natural resources are probably the most important revenue source for which the derivation principle is applied to centrally raised revenues in federations, there are important exceptions to its application: in Russia, for example, derivation is used to allocate national corporate and income tax revenues but not natural resource revenues. Finally, the derivation principle can be applied in degrees—it is not necessarily the case that all the revenues from a source will be allocated on the basis of derivation. In Nigeria, for example, the producing states get 13 percent of petroleum revenues, but the remainder goes into the general pool for allocation among all governments, federal and state.

The principle of need is quite flexible and is applied in different ways not only across federations but also in relation to particular revenue sources. Some countries, especially Organisation for Economic Co-operation and Development (OECD) federations such as Australia, Germany, and Switzerland, have highly developed overall systems of equalization, though the design of their regimes differs (for example, in assessing only capacity to raise revenues or assessing both this capacity and expenditure needs), as does the extent to which they try to achieve full equalization versus a limit to disparities. Many other federations, especially in developing countries, do not have a coherent, integrated definition of need, nor do they have an equalization program, as such. Rather, they apply a number of criteria in the allocation of the revenue pool. These criteria may still result in significant fiscal disparities between constituent units, and sometimes the formulas used for allocation actually worsen disparities. The United States has never tried to have an equalization program; instead, it has scores of conditional transfers, each of which has its own formula for allocations. The overall

distribution of federal transfers in the United States does not reflect need, so there are major disparities in the fiscal resources available to states.

Provisions and Mechanisms Governing the Allocation of Revenues

The most fundamental provisions relating to revenues in a federal constitution allocate taxing and other revenue-raising powers. Some federations empower both orders of government with broad revenue-raising powers, while others tend to concentrate the most important revenue instruments in the federal government. In some federations, such as Australia and Canada, the ability to impose royalties is tied to the provincial or state ownership of extractive resources. As discussed in the revenue-raising section, most federations in the developing world tend to be fiscally centralized, especially in terms of revenue raising, even if expenditure responsibilities are relatively decentralized. In this case, there needs to be substantial revenue sharing or federal transfers to the constituent units.

The more fiscally centralized a federation, the more important the principles and provisions relating to the allocation of centrally raised revenues become. Some federations have constitutional provisions related to the principles for allocating revenues among governments, including the following:

- Canada: there should be "equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation" (Art. 36.2).
- Germany: the federal government may legislate in areas of concurrent legislation with the provinces where necessary to provide for equal living conditions (Art. 72) throughout the country.
- Iraq: the federal government shall distribute "its revenues in a fair manner in proportion to the population distribution in all parts of the country" (plus some transitional provisions) (Art. 112).
- Nigeria: the Nigerian constitution specifies a number of principles for making allocations from the federation account, including "population, equality of states, internal revenue generation, landmass, terrain, as well as population density" (Sec. 162).
- South Africa: there should be "the equitable division of revenue raised nationally among the national, provincial, and local spheres of government" (Art. 214.1).

A few federal constitutions have explicit formulas for the allocation of petroleum revenues among governments. In addition to the principles cited above, the Nigerian constitution provides that not less than 13 percent of natural resource revenues shall go to the producing states (Sec. 162). The Brazilian constitution has detailed formulas for allocating petroleum revenues among the federal government, the governments of producing and other states, and the governments of producing and other municipalities. The Malaysian constitution guarantees 5 percent of royalties to producing states. In general, these arrangements have proven unsatisfactory and have given rise to serious fiscal imbalances within the federations, especially when oil revenues are very large. In Nigeria, for example, the richest oil-producing state has on occasion had more than 15 times more

revenues per capita than the poorest nonproducing state. Although in principle it might be possible to design a formula that would be appropriate for very different oil prices and production rates, in practice, these constitutionalized formulas have had the same sharing ratios no matter the circumstances.

This is why there are real advantages to limiting constitutional provisions to a set of principles for guiding the allocation of revenues. Whatever these principles may be, governments need to put mechanisms in place to consider and decide on the matter. In Canada, this decision is strictly the prerogative of the federal government, which can consult the provinces as much or as little as it pleases. But in several federations, independent advisory bodies play an important role in this matter. The constitutions of India, Nigeria, Pakistan, and South Africa establish such independent advisory bodies, but they can also be established by federal legislation, as they are in Australia. In Ethiopia, Germany, and South Africa, the constituent units have a formal role in reviewing the sharing of revenues through the upper houses, but in Germany and South Africa, the final decision rests with the lower house. Finally, the courts have sometimes played an important role in interpreting constitutional provisions on revenue allocation.

Because government priorities and capabilities change over time, it is best for federations not to have too rigid a system for revenue allocation. In most federations, the federal government has significant discretion over not just the allocation of revenues among the constituent units (and, in some cases, the local governments), but also what share it shall have for its own purposes. In federations with revenue sharing, there may also be intergovernmental transfers, so there can be a mixed system of revenue sharing; in those cases (such as in India and, to a lesser extent, Nigeria), the mandate of the finance commission might be restricted to revenue sharing, and it might not include fiscal transfers.

Are Natural Resources Special?

Revenues from natural resources are just one source of government revenues, but it is striking how often federal systems treat them differently from other revenue sources—notably, with a special fiscal benefit going to the constituent units where the resource was produced (or in the case of offshore production, in the zone adjacent to the constituent unit). There are arguments for and against treating natural resources as special:

For:

- When constituent units "own" the resource, they should receive a material advantage. However, even when a constituent unit does not have a legal claim of ownership, its population may still feel that the resource "is ours" and, therefore, that they should receive some benefit.
- Producing regions should receive some special revenues as compensation for local environmental damage, for infrastructure and manpower training costs associated with servicing the industry, and for investments needed to prepare for the time when the resource is depleted. In practice, no federation has implemented such concepts with any rigor, although in Mexico, such compensations account for very small payments.
- Resource revenues are a depleting asset and should not be treated the same way as income or other current revenues.

- When resource rights management and relevant revenue-raising powers are decentralized, the constituent units need an incentive of net fiscal gain if they are to have appropriate taxation and royalties; otherwise, they will undertax and seek to extract benefits in other ways.

Against:

- Federal governments are better able to manage the major swings in revenue from the petroleum sector than are constituent unit governments: they have a broader fiscal base, easier access to debt markets, and more flexibility in spending than constituent units normally do.
- When the petroleum sector is a major part of a country's economy or a major source of government revenues, the management of the sector and its taxation will have a major bearing on macroeconomic policy of the whole country, which is the responsibility of the federal government.
- Assigning too much revenue to resource-producing regions in a federation could lead to major fiscal disparities between constituent units. Such disparities could be inequitable and could also cause economic inefficiency if resource-rich regions are able to use their fiscal advantage to lower taxes and enhance services, thus leading to a "fiscally induced migration" of people and capital.
- A dollar from resources is not fundamentally different from a dollar from other sources. If there is concern about a depleting capital asset, the resource revenues could be assigned to a wealth fund, but income from that fund should be treated like other income.
- Producing regions receive nonfiscal benefits, such as employment and investment, from the resource sector and do not need special fiscal benefits.

Economists tend to argue for strict limits on treating resource revenues as special; however, the politics of many countries have often resulted in many fiscal benefits accruing to producing regions.

Comparative Experiences in the Allocation of Resource Revenues in Federations

Federations vary in terms of

- Which order or orders of government impose specific levies on the petroleum sector;
- Whether the distribution of petroleum revenues (or particular kinds of petroleum revenues) is determined in whole or in part by the principle of derivation, and, if so, what the legal basis for this distribution is; and
- Whether or not the distribution of petroleum revenues to constituent units influences the distribution of other centrally raised revenues to them.

The answers to these questions vary not just between federations, but also, in some cases, within a federation if different revenue streams (for example, onshore versus offshore petroleum revenue) are treated differently.

Table 10.1 shows how varied and complex fiscal arrangements concerning the allocation of revenue powers over and benefits from petroleum can be. The table

TABLE 10.1 **Petroleum Revenue Determination and Allocation in Federal Systems**

Country	Levies Determined by	Derivation Applicable	Impact on Allocation of Other Revenues	Importance of Petroleum Revenues
Argentina				
-onshore	Provinces plus federal government (export tax until 2017)	Yes for provincial revenues; federal revenues into national budget	No impact	Moderate nationally; high for producing provinces
-offshore	Federal government	N/A	N/A	Nil at present; recent call for exploration bids
Australia				
-onshore	State-levied royalties; federal Petroleum Resources Rent Tax (PRRT)	Yes for state royalties; federal revenues into general budget	Yes, full impact: these revenues are included in the calculation of state fiscal capacity, a key determinant of federal transfers	Low for producing states and nationally (but other resource revenues are moderate to high)
-offshore	Federal PRRT (beyond three miles) and state royalties inshore	As above.	N/A	Low
Bolivia	Central government	Yes for royalties, but very little for direct tax on hydrocarbons	No	High nationally; very high for producing departments
Brazil				
-onshore	Federal government	Yes; federal revenues, four-way allocation to federal government, producing states and municipalities, and other states and municipalities	No	Moderate nationally; high for key producing states and municipalities
-offshore	Federal government	Divided into deemed zones for adjacent states and municipalities, then four-way allocation as above	No	As above
Canada				
-onshore	Provinces	Yes: provinces keep their own revenue	Yes and no: onshore and offshore resource revenues can reduce equalization payments for eligible (poorer) provinces but have no impact on other federal transfers	Moderate nationally; high for producing provinces
-offshore	Provinces (within federal framework)	Yes: provinces keep their own revenue	As above	Low nationally; high for Newfoundland

table continues next page

TABLE 10.1 Continued

Country	Levies Determined by	Derivation Applicable	Impact on Allocation of Other Revenues	Importance of Petroleum Revenues
India				
-onshore	Federal government	Yes: states get federally determined royalties, but the federal government keeps other, larger imposts	No: state royalties have no impact on revenue sharing or other transfers from the federal level	Low nationally; moderate in one or two states
-offshore	Federal government	No share to adjacent states	N/A	Low nationally
Indonesia				
-onshore	Central government	Yes: producing regions and provinces get a share; special shares for Aceh and Papua	Yes: some offset through general transfer	Low to moderate nationally; low to very high for producing regions
-offshore	Central government	No except for Aceh	N/A	Low nationally; has been high for Aceh
Iraq	Federal government and Kurdish government	Not formally: federal revenues distributed to regions on the basis of population. KRG illegally kept some revenues from its own production	Federal government periodically withheld payments to KRG in response to KRG's illegal oil exports and withholding of some revenues	Very high for all governments, both producing and nonproducing
Malaysia				
-onshore	Federal government	Yes: states get 5 percent royalty onshore, though this is a very small share of total petroleum revenues	No: royalty payments do not influence other transfers	Low to moderate nationally; low for producing states
-offshore	Federal government	Depends: Borneo states get royalty from entire offshore production; other states do not	As above	As above
Mexico				
-onshore	Federal government	Limited: producing states receive very minor payments in certain conditions	No impact on other federal transfers	High to moderate nationally with offshore; low for producing states
-offshore	Federal government	No sharing of offshore revenues	N/A	With onshore, high to moderate nationally

table continues next page

TABLE 10.1 **Continued**

Country	Levies Determined by	Derivation Applicable	Impact on Allocation of Other Revenues	Importance of Petroleum Revenues
Nigeria				
-onshore	Federal government	Yes: producing states get 13 percent of revenues; the balance goes to the federal government	No	With offshore, very high nationally and for producing states
-offshore	Federal government	States get 13 percent from most, but not all, adjacent offshore production	No	As above
Pakistan				
-onshore	Federal government	Yes: most petroleum revenues (out to three miles) go to producing provinces	No impact on other transfers	Low to moderate for producing states; very low for federal government
-offshore	Federal government	No	N/A	No production
Russian Federation				
-onshore	Federal government	No, but derivation does apply to corporate and personal income taxes	N/A	High nationally
-offshore	Federal government	No	N/A	Low to moderate nationally
United States				
-onshore: state land	State governments	Yes: states keep revenue	No: the United States has no integrated sharing or transfer regime but many conditional transfers	High for some producing states
-onshore: federal land	Federal government	Yes: federal government gives states large share of revenue	As above	As above
-offshore	Federal government	Very limited revenue to adjacent states	N/A	Low nationally and for states
Venezuela	Federal government	No, whether onshore or offshore	N/A	Very high nationally.

Note: KRG = Kurdish Regional Government; N/A = not available.

is necessarily at a high level of generality. The following discussion elaborates a little on the situation in various federal or devolved regimes.

Argentina: The federal government introduced a heavy export tax from 2002 to 2017, which effectively took about two-thirds of petroleum revenues, even though the provinces own the resource and levy a royalty on production. The provincial take of petroleum revenue was further reduced when the export tax caused domestic oil prices to drop.

Australia: Australia has what is perhaps the most equalizing fiscal regime of any federation: federal revenue sharing and transfers take account of all state revenues as well as the different cost structures associated with each state's delivery of a standardized bundle of public goods. Thus, although states keep onshore revenues, they get little net fiscal benefit from them. This process may incentivize them to focus more on stimulating activity than on trying to raise their own petroleum revenues through royalties. Despite state ownership of onshore resources, the federal government has introduced a petroleum resource rent tax, which applies within the states, to collect a portion of the rent.

Bolivia: Bolivia had a major debate on whether to federalize its government, which the relatively affluent petroleum-producing regions strongly supported. After an extended political process, the country's new constitution is formally unitary, with the central government controlling petroleum management and revenue distribution. There are elected departmental governments: the few producing departments receive 12.5 percent of the main petroleum revenue, while the much more populous nonproducing departments receive 31.25 percent. This arrangement benefits the producing departments, especially those with small populations (Just Quiles 2013).

Brazil: Brazil has a regime that strongly favors not just producing states, but also "producing municipalities," including those with revenues from their adjacent offshore areas. With major new offshore oil discoveries, the allocation of fiscal benefits—particularly between producing states and municipalities and nonproducing ones—became a major issue in Brazilian politics. In 2012, representatives of nonproducing states in Congress forced through a new law (over the veto of President Rousseff) that would raise the percentage of petroleum revenues given to nonproducing states and municipalities while lowering the percentage given to producing states and municipalities and, to a lesser extent, to the federal government. In an appeal to the country's supreme court, the producing states asserted that this law was unconstitutional; in the meantime, the rules remain as they were.

Canada: Canada has an equalization program that is designed to lift its poorer provinces to a national standard. However, this program does not bring richer provinces down to a national standard, and richer provinces receive most federal transfers on the same basis as do poorer provinces. On occasion, high petroleum production and prices have caused the per capita fiscal resource capacity of producing provinces to approach twice that of nonproducing provinces. The federal government, with limited access to petroleum revenues (mainly through the corporate income tax, and without a special levy on the sector), has not been able to significantly reduce the disparities between producing and nonproducing provinces, especially during periods of high oil prices.

India: Despite state ownership of petroleum resources, the much larger share of petroleum revenues flow to the central government, where they are pooled with other revenues for general sharing without reference to derivation. India does not have a formal equalization system, although its revenue sharing reduces disparities. Producing states have complained about their small fiscal share of onshore revenues and lack of a share of offshore revenues.

Indonesia: Indonesia has separate rules for allocating oil revenues versus gas revenues: for oil revenues, 84.5 percent goes to the central government, 3.1 percent goes to the provinces, and 12.4 percent goes to the districts; for natural gas revenues, 69.5 percent goes to the central government, 6.6 percent goes to the provinces, and 24.5 percent goes to the districts. In both cases, the share going to the districts is allocated half to the producing districts and half to the rest. This arrangement produces major fiscal disparities between districts and provinces. As part of the peace deal in 2005, Aceh was to receive 70 percent of petroleum revenues for nine years and then 50 percent after that. Papua and Papua Barat, which have much smaller production, will receive 70 percent for 25 years before dropping to 50 percent (Agustina and others 2012).

Iraq: Petroleum arrangements were left ambiguous in Iraq's hurried completion of its federal constitution in 2005. Since then, the federal government has controlled the petroleum sector outside of Kurdistan, while the Kurdish government has controlled it within that province. Kurdistan was meant to send 83 percent of its oil revenues to the federal government, and in exchange, it was to receive 17 percent of the federal budget, equivalent to its share of the population; it produces about 10 percent of the country's oil. This arrangement was frequently violated by both sides, but in December 2014, the Iraqi and Kurdish governments agreed on a cooperative arrangement regarding petroleum exports from Kurdish-controlled areas and revenue sharing. However, since the failed Kurdish referendum in 2017, the federal government has taken Kirkuk, which accounts for half of Kurdish oil production, and it has dramatically reduced the Kurdish Regional Government's share of federal revenues, leading to a major fiscal crisis in the KRG.

Malaysia: Because Malaysia's states are very weak fiscally compared with those in most federations, their share of royalties, while only a small part of total petroleum revenues, has been important to producing states, and these states are seeking to enlarge their share. Petronas, the national oil company, is the major source of petroleum revenues for the government, and the major lack of transparency in its system has been a central issue in the recent change in government; charges have been pressed against the outgoing prime minister.

Mexico: Mexico has always had a highly centralized regime, with the states fiscally dependent on the federal government. However, producing states receive almost no advantage from production, except for small amounts under limited conditions. For many years, the central government decided what revenues it would take from the national petroleum company in a nontransparent manner. It has recently moved to a transparent fiscal regime for petroleum.

Nigeria: Oil dominates government revenues in Nigeria, and the distribution of these revenues is a perennial political issue. The current system gives the producing states 13 percent of oil revenues plus all the other transfers that other states receive; therefore, there are huge fiscal disparities between Nigerian

states, with per capita differences as much as 15 times, depending on oil prices. Even so, the producing areas in the Niger delta have had poor economic and social development, partly because of bad local governance and corruption and partly because of federal neglect. The poor conditions in these regions have led to widespread crime and oil theft. The federal government has accelerated its direct efforts to aid development in the delta through special regional agencies (Osaghae 2013).

Pakistan: As part of far-reaching reforms to its federalism in 2010, Pakistan amended its constitution to acknowledge joint ownership of natural resources between the federal government and provincial governments. In addition, it was agreed that the producing provinces would receive all petroleum revenues. Pakistan is a small producer; therefore, its petroleum revenues are not important nationally. However, they are significant for Baluchistan, which has a small population and a large share of production.

Russia: Russia amended its constitution to deprive the petroleum producing "subjects of the federation"—which have huge territories but mostly very small populations—of any control over the petroleum industry or any special benefit from petroleum revenues. However, the derivation principle does influence the distribution of corporate and income taxes; therefore, the producing regions enjoy a significant indirect fiscal benefit because of high local corporate and personal incomes.

United States: Although the American petroleum industry is huge, it is a relatively small part of the country's economy, so revenues from the sector have not been significant nationally. However, revenues from the petroleum sector have been very important to several producing states, a few of which have had much higher fiscal revenues per capita than other states. The sharing with states of mineral revenues from federal lands within those states started in the 19th century and increased to a 50 percent share by 1970, with another 40 percent going into a fund for reclamation and infrastructure projects in 17 western states. Coastal states with offshore production receive only a modest share of offshore petroleum revenues, and they are campaigning for more.

There are a few general observations to be drawn from these experiences. Some countries, such as Argentina, Brazil, Canada, Indonesia, Nigeria, Pakistan, and the United States, have significant fiscal advantages for producing constituent units, while others, such as Australia, Bolivia, India, Iraq, Mexico, and Russia, do not. Pakistan moved recently to enhance the fiscal advantage of producing constituent units, while Brazil and Russia moved to limit it. The extent of fiscal advantage varies from country to country—from extremely high, as in Nigeria, to relatively modest, as in Pakistan. Australia is unique in the extent to which it "claws back" the fiscal advantage of producing states by reducing their other transfers. Canada and Indonesia also have some mechanisms that work in this way, but they are partial and have less effect.

Good Governance and Fiscal Probity

The presence of significant petroleum resources can offer major opportunities for betterment, but it can also add to the challenges of achieving good governance—both in controlling corruption and in managing a resource-based economy subject to volatile prices. While major principles of good

governance—including clarity on responsibilities, transparency, and probity—are well known, they can be undermined in the context of a highly profitable oil sector, and they can be even more difficult to manage in a devolved or federal regime. Some petroleum-producing countries have tried to address these challenges with special stabilization and savings funds; increasingly, federal regimes are adopting fiscal responsibility laws, as well as detailed provisions regarding financial governance, in their constitutions.

The notion of the "oil curse" has been discussed in earlier chapters. One dimension of this curse is the risk that petroleum revenues present for corruption, while a second, quite distinct dimension, is the challenges that a large petroleum sector can present for managing a diversified economy through economic cycles. Fortunately, "the resource curse is not inevitable: a range of countries with prudent and transparent management practices (including Botswana, Canada, Chile, and Norway) has benefited from resource wealth" (IMF 2007). The challenges of successfully managing resource revenues are greater in developing countries with large resource sectors. There can also be additional challenges if the political regime is significantly devolved, as in federal systems. The International Monetary Fund (IMF) and the World Bank have developed guidelines for good fiscal practices for resource revenue management. A review of some of the more important principles of these practices follows, with special attention paid to their application in a federal regime:

- The need for *clarity of roles and responsibilities*, including within the legal framework and the fiscal regime, and for transparency regarding revenue flows and borrowing as well as required expenditures by resource companies on social or environmental purposes and consumer subsidies without explicit budget support. Arrangements for assigning or sharing resource revenues between central and subnational governments should be well defined and should explicitly reflect national fiscal policy and macroeconomic objectives.

- The need for *open budget processes.* Budget frameworks should incorporate a clear policy on the rate of exploitation of natural resources within the context of overall fiscal and economic objectives. Resource-related revenue funds should have clear operational rules coordinated with fiscal policy, and the investment policies for such funds should be clear. The government accounting system or special fund arrangements should identify all resource-revenue receipts on a timely and public basis.

- The need for *public availability of information.* There should be transparent and comprehensive reporting on government finances, including on all assets and debt. The nonresource fiscal balance should be presented as an indicator of macroeconomic impact and sustainability. Debt reports should identify any direct or indirect collateralization of future resource production as well as any risks or obligations from debt. Estimates of the asset value of probable production should be clear, as should contingent liabilities associated with the resource sector. Finally, price risks and contingent liabilities' association with resource revenues should be explicitly considered in budget documents.

- The need for *assurances of integrity.* Audit procedures and internal controls should be clear. Tax obligations and rights should also be clear, and the scope for discretionary action by tax officials should be clearly defined. A national audit office should report regularly on revenue flows between companies and the government (IMF 2007).

These principles set a high standard that few, if any, countries fully realize. Moreover, complying with them, notably with those related to coordinated fiscal policy, will be especially difficult in a federation with highly devolved resource management and taxation. As outlined in this chapter, many federations have quite rigid rules on the sharing of resource revenues or of centrally imposed revenues in general. This rigidity can present challenges for macroeconomic fiscal management, in that revenue flows to the constituent units are not coordinated with fiscal policy. In principle, federations with revenue sharing could address this issue through an arrangement whereby resource revenues (or even revenues in general) are shared not only between the orders of government but also with a resource revenue fund (or funds—one for stabilization and one for savings). Russia adopted a stabilization fund in 2004, and this fund became a principal instrument for holding down excessive liquidity and lowering inflationary pressures at a time of skyrocketing petroleum prices. In 2008, the country shifted to a new approach whereby oil and gas revenues were accounted for separately from other revenues. Part of them, known as the oil and gas transfer, was included in the federal budget. The size of this transfer was set, and the balance of resource revenues went into a reserve fund or, above a certain threshold, into a national wealth fund (Kurlyandskaya, Pokatovich, and Subbotin 2012, 298–300). There is no such formal arrangement in Nigeria, and federal measures to hold back some portion of centrally collected revenues for various purposes, including for revenue stabilization, have been found illegal by the country's supreme court and are objected to by the states—but the federal government persists in doing so (Iledare and Suberu 2012, 240).

A number of federations have tried to address these issues of fiscal coordination through fiscal responsibility laws. Such laws can establish fiscal targets as well as procedural rules for transparency and accountability; they can include rules around borrowing and incentives for fiscal prudence (Liu and Webb 2011). Although such laws can be helpful, it can be difficult to get the political agreement necessary to put them in place. Cooperation is more likely to happen in the context of addressing a crisis, when the federal government must step in, as happened in Brazil in the 1990s. If a federal government makes large, discretionary transfers to the constituent units, it may use this concession as a lever to win their cooperation. However, when the overwhelming share of revenues going to constituent units are transferred through revenue sharing, the challenge of establishing fiscal responsibility laws can be especially acute, as has been seen in Nigeria, because the federal government may have limited leverage.

Transparency takes on additional importance in federal regimes with revenue sharing in that the constituent unit governments have a material stake in knowing exactly what revenues have been collected. However, no federation gives their constituent units a role in auditing the federal accounts; the national audit office typically is named by the national government, perhaps with parliamentary approval. In some federations, such as India, there is one national audit

office that serves both the national and constituent unit governments. This method has efficiency advantages but limits the extent to which constituent unit governments can interfere with the audit function—which has been a problem, for example, in Nigeria, where each state has its own audit office. Some of the newer federal-type constitutions, such as those of South Africa (Sec. 213–18) and Kenya (Sec. 220–29), give strong authority to the central government to establish rules relating to fiscal prudence.

Summary Observations and Some Recommendations

A number of federal and other devolved systems of government have had to deal with the issues of oil and gas ownership, management, and revenue sharing. The approaches they have developed reflect their constitutional history (oil and gas may not have been an issue when the basic law was drafted), their political culture, and the importance of the resource itself within the national context. The federations with devolved management tend to be older federations in which the petroleum sector is central to neither the economy nor government revenues. Even so, in these federations, the federal governments have important fiscal and legal levers that they can use to influence the development of the petroleum sector. Federations in developing countries tend to have given almost all of the management instruments relative to the petroleum sector to the central government. In some cases, such as in Malaysia and Russia, the federal government captured these powers through legal or constitutional change when the industry was significant. Management control may be linked to ownership, but often it is not—especially in developing country federations.

In developing countries with federal regimes, there is a natural pressure to centralize management of the oil sector. Arguments for centralized management include that the issues surrounding oil production are complex and that big foreign oil companies are extremely sophisticated, so the limited human and financial resources of a country should be concentrated to build an effective central management capacity. Furthermore, if the resource is very large, it will necessarily be of national significance, justifying federal government leadership. However, centralization has too often been done with little sensitivity to circumstances in the producing regions. Producing regions naturally have a strong interest in petroleum exploration within their territory because of the potential impacts to the environment, employment, and society. Thus, there are strong reasons to find a way to give real voice in petroleum management to producing regions. The challenge is to find a workable balance, one that permits timely and effective decisions and avoids competition between governments using their powers for narrow partisan or personal gain.

Federations have very diverse approaches to revenue raising and allocation. In all federations, the federal government raises more revenues, through taxes and debt, than it spends on its own purposes; therefore, some federally raised revenues flow to the constituent units, through revenue sharing, fiscal transfers, or some combination of those. When revenue sharing is used, the allocation of revenues can be determined using various criteria, including need (or rough proxies for need) and derivation. However, the choice of these criteria by federations has been very political. When resource revenues have been isolated from

other revenues for sharing, the derivation principle has been given some weight. But many federations pool resource revenues with all other revenues for sharing—in which case principles other than derivation are used for allocation. Still others rely principally on fiscal transfers—in which case derivation is not applied (in fact, federal transfers can decrease when a constituent unit gains access to resource revenues).

Although the technical challenges concerning resource revenue sharing are less difficult than those around joint management, the politics surrounding this issue can be extremely contentious. There is a case for giving some extra fiscal benefit to producing regions, but this benefit should be given in a way that does not create major distortions between regions of the country. It is wise to avoid rigid formulas in constitutions, which may not prove appropriate in all contexts.

Although there are few hard rules, architects of federal regimes would do well to consider such basic economic principles as efficiency and equity, as well as the benefits of transparency and accountability, in designing arrangements around natural resource management and revenues. They will also need to consider the importance of the natural resource sector within the country and the broader political context or understanding on which the country may be based.

Notes

1. See Watts 2008, 8–9. Other characteristics of federations can include a second legislative house based on regional representation and an umpire of the constitution, normally a high court.
2. Such ownership also exists in Canada for lands transferred to the Canadian Pacific Railway to induce the building of that railway in the 19th century.
3. While the federal government regulates interstate pipelines, American states have some powers over the "siting" of pipelines, for example, the power to protect environmentally sensitive areas, as well as over the technical standards and construction of pipelines.
4. Australia's Petroleum Revenue Rent Tax is an exception; for information on this tax, see https://www.ato.gov.au/Business/Petroleum-resource-rent-tax/.
5. Germany is a rare exception among federations in that the richer provinces make transfers directly to the poorer provinces. These transfers supplement other revenues flowing to the provinces from the federal government as well as locally raised revenues. See Feld and von Hagen (2007, 143–46).
6. For a much fuller discussion of these methods, see Boadway and Shah (2009, 291–339).

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