

Oil and Gas in Federal Countries¹

Introduction

Natural resources are important to the politics and economics of many countries, and oil and gas stand alone amongst natural resources in their significance globally and for such a large cross-section of countries. In many countries oil is at the centre of national politics and economic policy, but managing oil wealth presents challenges that have sometimes made it more a curse than a blessing. The success of a country in meeting these challenges will depend on many factors, including the nature of its political institutions, one of which can be a federal system.

The world's federations represent a large share of global oil and gas production, with nearly half of all oil – and over half of all natural gas – production taking place in federal countries. While this paper looks at petroleum resources only, the issues it examines are similar to those with other non-renewable mineral resources.

Federal institutional arrangements can be critical in influencing a country's management and revenue regimes for oil and gas. Federalism empowers both regional governments as well as the national or federal government. As petroleum resources are typically very unevenly distributed amongst the regions of a federation, the allocation of power and the sharing of revenues can have major consequences for those who live in petroleum rich regions, as well as for those in the rest of the country. While all federations have a constitutional division of powers between at least two orders of government, there can be great difference in terms of the extent of decentralization. In fact, many non-federal countries are, in governance practice, more highly decentralized than recognized federations.

Federalism and petroleum resources can be a volatile mixture. Federations are based on a division of powers among governments, including the power to control or raise revenues from

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non-renewable resources. In petroleum rich federations, there are often tensions over the resource – vertical tensions between different orders of governments, as well as horizontal tensions amongst producing and non-producing regions. And while constitutions may establish a framework for these powers and responsibility, it will be politics that determine how the tensions play out.

This paper will examine three key questions about oil and gas resources in a federal system: who owns the resource, who manages the resource, and how the revenues are collected and shared. Attention will be paid to the constitutional considerations, as well as the administrative and fiscal arrangements that are developed in order to efficiently manage the exploitation of the resources. The final section of the paper will offer snapshots of how twelve federal counties manage their petroleum sectors, detailing the particular constitutional, management and fiscal arrangements around oil and gas, both onshore and offshore.

Constitutional Framework: Who owns the resource?

Federal systems have constitutional division of powers between two (or more) orders of directly elected government. Federal constitutions dictate ownership of the oil and gas resources, and also allocate management and fiscal responsibilities in relation to the petroleum sector. But constitutions operate within a broader political, economic and social context, so their rules can be interpreted, bent or changed to reflect the larger forces operating in the society. Some federal constitutions were written before the emergence of the petroleum industry or any focus on subsurface resources, while others reflect clear consideration of the issue by the constitutional drafters: the former tend to favour constituent unit control, while the latter tend to favour central control. Whatever the constitution provides, the issue is whether the assignment of responsibilities is in agreement with the political forces active in the country or whether it is in tension with them. In the latter case, politics can be expected to challenge the practical meaning of the constitution: it may be that the federal government plays a larger role in relation to the sector, or that the oil-producing constituent units manage to win a management role or a special share of resource revenues. In other words, constitutions matter, but they are only part of the story.

Inhabitants of producing regions may feel strongly that they have some proprietary claim—whether in the constitution or not—while national politicians and citizens and other regions may equally feel that the resource is a national treasure and should be shared. In some federations, there is a consensus—one way or the other—on this issue, while in others it is hotly disputed. While many fiscal federalism feel that central control of petroleum management and resources is preferable in a federation, this argument may be stronger when the resource is more important

relative to the economy and for total government revenues. In other words, the trade-off will depend on particular country situations.

The older federal constitutions, dating from the eighteenth and nineteenth centuries, were written before the “age of oil”, when sub-surface resources of all kinds were either ignored or of largely local interest. These older constitutions tended to give responsibility for such resources to constituent units, often because the federation had been formed by a “coming together” of previously independent colonies or states, which brought their resources into the union with them. The more modern constitutions, particularly those which reflect a national revolution or the emergence from twentieth century colonial rule, tend to favour strong federal governments with significant powers over the resource sector.

Administrative framework: Who manages and develops the resource?

While ownership may be clearly defined by the constitution, management of the resources in many cases can be a shared responsibility, or an exclusive power of the “non-owning” government. Although it is easy to assume that constitutional “ownership” of natural resources by an order of government determines, or is at least closely related to, the management of the resource and its revenue benefits, this need not be the case. In federations, there is no consistency in how ownership of natural resources is assigned to orders of government and the legal, financial and political significance of ownership can differ greatly

While the primary responsibility for natural resources may be constitutionally with one order of government in a federation, there can be other powers assigned to the other order of government that also bear on resource management, e.g. environmental regulation, surface land use, or revenue raising. Moreover, constitutions can be subject to shifting interpretations over time, and even amended if they stand in the way of strong political forces.

The key resource management powers include the issuance of licenses with the associated conditions to explore and develop the resource, but other jurisdictional handles can be important in the management of the resource. Most notable are land use permits, which can give constituent unit governments a role in some decisions, and regulations around environmental protection and local benefits. Thus, in a number of federations where one government controls the main resource management powers, the other order of government may have some role in

regulating petroleum activities. It should be noted that these secondary powers are usually used for their intended purpose, and not as a backdoor to managing the resource as such. Thus they have not constrained the lead of the government—whether federal or constituent unit—that is the resource manager to pursue its policies, so long as certain standards relating to land use, the environment and perhaps local benefits have been met.

Onshore:

In most federations, the “ownership” of sub-surface resources is established in the constitution, but this can be different from the powers of resource management and resource revenue determination and collection. The table below shows that ownership of onshore resources is with the constituent units in most federations, but with the federal government in Brazil, Mexico, Nigeria and Venezuela. The United States is an outlier in that ownership of onshore resources can be either state or federal, depending on whether the land is state or federal, and ownership of subsurface resources is typically private when under private land. Russia and Pakistan are also exceptions in that ownership is deemed to be joint amongst the federation and the constituent units.

Table 1: Onshore Ownership, Management and Revenue Assignment for Petroleum in Twelve Federations

Country	Ownership	Resource Management	Resource Revenue
Argentina	provinces	provinces	provinces/federal
Australia	states	states	states
Brazil	federal	federal	states/federal/municipal
Canada	provinces	provinces	provinces
India	states	federal	federal/states
Malaysia	states	federal	federal/states
Mexico	federal(nation)	federal	federal
Nigeria	federal	federal	federal/states
Pakistan	joint	federal	provinces

Russia	joint	federal	federal
United States	states/federal/ private	states/federal	states/private
Venezuela	federal	federal	federal

A government’s ownership of the resource does not necessarily mean it will have control over the resource or be the principal beneficiary of the resource rents coming from its resource. In eight of the twelve federations, the principal responsibility for resource management goes along with resource ownership, but in four cases it does not: in India and Malaysia, the federal government manages the resource owned by the constituent units, while in Pakistan and Russia, the jointly owned resource is managed by the federal government. Ownership is obviously not an absolute and means quite different things in different federations.

While it can be a complex matter to calculate the precise sharing of resource revenues amongst governments in a federation (and this can be changeable as prices and policies evolve), the basic picture for each country emerges fairly clearly. The table shows that in only six of the twelve federations does the government which is the resource owner usually receive the principal share of resource revenues, excluding normal taxes on the sector that other industries would pay. In India, Malaysia, and Russia, the federal government receives the larger share (or virtually all) of onshore resource revenues even though the resource is owned by the constituent units or jointly (as in Russia). The situation is exactly the opposite in Brazil and Nigeria, where the states (and in Brazil, the municipalities as well) receive a larger share of resource revenues than does the federal government, despite federal ownership, with the producing states being especially favoured. Similarly, the US federal government, which has large land holdings in certain states, has given up its resource revenues to the states where these lands are located.

Offshore:

Table 2 shows that this separation of ownership, management and revenue benefits continues out into the offshore regions. In all federations, the federal government is deemed to own (or perhaps “effectively own” given the stipulations of the UN convention on the Law of the Sea) the offshore, including the vast economic zone, because the offshore lies outside the boundaries of the constituent units. Thus constitutional control of the offshore rests with the federal governments. This is true even in Malaysia despite the ownership of the offshore by the Borneo states and in Pakistan, which recently approved a constitutional change to joint ownership.

Legislation can also be used to devolve management of offshore regions. In Canada, the federal government in Canada has ceded effective management and the revenues of its offshore resources to the two provinces with offshore production. Australia has developed a joint management regime for the offshore, though the federal government retains ownership. While US states have no control of the offshore, several states have been successful in forcing offshore moratoriums by denying effective land access. In Brazil, the federal government owns and controls the offshore, but the states (especially the adjacent states) and municipalities get most of the revenues.

Table 2: Offshore Ownership, Management and Revenue Assignment for Petroleum in Twelve Federations

Country	Ownership	Resource Management	Resource Revenue
Argentina	federal	federal	federal
Australia	federal	joint	federal
Brazil	federal	federal	states/federal/municipal
Canada	federal	provinces/joint	provinces
India	federal	federal	federal
Malaysia	federal/states	federal	federal
Mexico	federal	federal	federal
Nigeria	federal	federal	federal/states
Pakistan	Joint	federal	federal
Russia	federal	federal	federal
United States	federal	federal	federal
Venezuela	federal	federal	federal

Fiscal framework: How are revenues collected and shared?

Resource revenues can be collected in many ways: through corporate income taxes, royalties, licence fees, land use fees, export taxes, and various special charges on the sector. While royalties are normally considered a payment to the resource owner, in some federations there are royalty payments that flow (directly or through sharing rules) to governments that do not own the resource, and the resource owner may not set the royalty rate. In countries where national oil companies are important (or even a monopoly), they may be subject to their own fiscal regime and make some payments to government through dividends.

While one order of government may determine and collect petroleum revenues, it may not necessarily be the main beneficiary of these revenues, because of larger fiscal sharing arrangements and/or specific rules for sharing resource revenues. The rules for the allocation of these resource revenues can reflect constitutional provisions, the broader culture around fiscal sharing and equalization in the federation, and even the depth of regional divisions (where historical political or economic tensions may make the producing regions less inclined to share). In short, there are a wide variety of instruments and arrangements used in the collection of resource revenues by the two orders of government in federations.

1. Derivation

Derivation refers to the percentage of the revenue that producing states retain from petroleum resources produced in the state. As federations differ not only in their allocation of revenue powers between the two orders of government (e.g. in ability to determine royalties and profit taxes) but also in the rules of allocation of those revenues collected by the centre, the principle of derivation may play a role in the allocation of some revenues to constituent units. In Brazil, for example, producing states get a share of all resource revenues based on derivation, while in India and Malaysia they get a share of royalties only, and in Russia the producing constituent units get no share of resource revenues collected within their boundaries but do get a share of income taxes, based on derivation. So the derivation principle varies not only in the extent of its application, but also in the form.

2. Assignment and use of revenue powers

Rules on who can impose particular taxes or levies on revenue sharing can affect the incentives of the different orders of government to adopt or favour the use of certain taxes. For example, if a federal government is obliged to share taxes of a certain kind with constituent units but not to share those of another kind, it will have an incentive to make greater use of the latter because this will increase its own, non-sharable revenues.

Central governments can also use broad fiscal tools to strengthen the national petroleum sector. Although import charges and quantity constraints on petroleum imports are now infrequent, in the past they played an important role in aiding the petroleum sectors in the United States and Canada in the early post-war decades by shoring up prices at a cost to consumers and to the benefit of oil companies and the producing states and provinces. They have also been used by some developing countries, such as India and Pakistan, as a source of fiscal revenues and a way to protect the local industry. While they put an extra burden on consumers, they can accelerate development of domestic production and raise the revenues of governments from the upstream sector.

In some federations, significant resource rents never appear in the fiscal accounts of governments. This can happen because the revenues get diverted into “off budget” accounts or held by a state-owned national oil company. It can also arise when domestic oil and gas retail prices are held down, so that resource rents are not collected by governments, but rather distributed to consumers as subsidies. Such practices can be important in federations where the federal government is meant to share resource revenues with the constituent units because it can significantly shrink the shareable pot or where constituent units have direct access to resource revenues, e.g. royalties, and find that their potential take is reduced by low prices. Of course, in some countries there is a desire to protect very vulnerable poor people from high costs for fuel, despite the fact that controlled prices can result in distortions in federal fiscal arrangements for resource revenues.

3. Competition for resource revenues

Another issue which can arise in federations where both orders of government can impose levies on the petroleum sector is whether they compete or cooperate. In cases where the constituent units own the resource and levy royalties and license fees, the federal government, where authorized, can impose a levy (such as an export tax), permitting it to capture part of the resource rent. As this creates a lower price for the resource at the wellhead, it can lower royalty revenues for the sub-national governments and create political tensions within the federation, particularly

if the constitution does not require that the federal government share this specific tax revenues with producing units, or in the general fiscal transfer scheme. In other cases, orders of government will cooperate to incentivize resource development and exploitation; for example, through offering temporary taxation exemptions for specific industrial activities.

Sharing revenues: Are resource revenues special?

Federations have different philosophies regarding revenue sharing in general and resource revenue sharing in particular, but all federal governments share certain revenues with the constituent units or make transfers to them, which may be conditional or unconditional. In many federations the constituent units are heavily dependent on transfers from or tax sharing with the federal government, but in some others, the constituent units are largely self-financing. Some federations are strongly equalizing—in that they try to ensure that all constituent units meet at least a national standard in terms of their fiscal capacity, after transfers—while others tolerate major fiscal disparities. In addition to the general approach to revenue sharing, some federations have special arrangements for sharing—or not sharing—resource revenues.

A key question in either kind of regime is how to treat the allocation of natural resource revenues and whether they should be treated differently from others. In particular, should the constituent units where petroleum or other natural resources are produced be given a special fiscal benefit because of the resource extraction within their territory?

In federations where ownership of natural resources is held by constituent units, some will claim that this should give them a material advantage, as ownership usually does. However, it is apparent that issues of ownership do not necessarily translate to management and revenue authority, as there are cases where constituent units have successfully petitioned for a special share of federal owned revenues raised within their borders or in the adjacent offshore areas. Producing regions may also wish to claim a special share of revenues as compensation for local environmental damage, for infrastructure costs associated with servicing the industry, and for the investments needed to prepare for the time when the resource is depleted.

Opponents to this claim could point out that if there is concern about a depleting asset, let the resource in the ground be converted to capital in the bank which provides a continuing stream of income. They would note that producing regions usually enjoy significant employment and investment benefits and do not need special fiscal benefits in addition. They could also make a case that horizontal fiscal imbalances between rich and poor constituent units in a federation

could become economically distorting if resource rich regions receive too much net benefit and are able to offer significantly more attract combinations of enriched government programs and lower taxes. .

Experience suggests that these philosophical and technical arguments often matter less than the political culture and traditions of the federation. Regional claims to a special share will be stronger depending on supportive constitutional provisions, strong regional identities, and other constraints on centralization. Some federations that have sharing of centrally collected revenues invoke the “derivation” principle to justify giving a special share of resource revenues to producing regions

The sharing of petroleum revenues is not usually very contentious in federations where they are a small part of total government revenues. To the extent that it has been an issue, it has often been pushed most by the producing regions which are seeking to protect or maximize their local benefits. Thus the American producing states were able to win the right to petroleum revenues from federal lands within their boundaries. Similarly, two of Canada’s small Atlantic provinces were given the right to offshore petroleum revenues, due to their relative poverty and astute and timely political maneuvering. The successes of state governments in India, Pakistan and Argentina in winning fiscal concessions at different points from their central governments also reflect what can be the advantage of small, concentrated interests in a context where the stakes are relatively minor at the national level.

Managing the Broader Economic Impacts of the Petroleum Sector

Federations which are heavily dependent on petroleum revenues face a different order of challenge from the others in terms of macro-economic management given the volatility and uncertainty of these revenues. In addition, there are some constituent units in other federations which can also face special challenges of fiscal management associated with their high dependence on petroleum sector revenues.

These challenges include how to deal with the “oil curse” or risk of “Dutch disease”, whereby other sectors are crowded out. Having a large petroleum sector can be a real asset, and not a curse, if countries have good quality governance, focus on developing a medium to long-term investment policy, and pursue a wider economic diversification. But good governance is not always easy in developing countries with a dominant oil sector, which can be an invitation to waste, corruption, cyclical swings and excessive dependence.

A central difficulty for fiscal planning is the uncertainty of petroleum prices and revenues. Government spending in resource dependent economies tends to be pro-cyclical and

destabilizing because of the enormous pressures to spend during commodity booms. Booms are followed by painful busts, with major fiscal cuts. Petroleum rich federations can face the added problem of uncoordinated fiscal policies amongst the central and constituent unit governments and this can be aggravated if transfer regimes are poorly designed.

In federations, fiscal arrangement can also provide lower level governments with more stable revenues than central governments. In many federations the constituent units have limited access to debt, while the federal government is better placed to undertake counter-cyclical fiscal management. Constituent units also tend to have more stable spending responsibilities, e.g. on basic education and social services. Thus the design of transfer regimes to the constituent units is important: where transfers are significant, they should be relatively predictable and constant for base programs.

In federations where the resource revenues are collected by the federal government, and shared with the regional governments, federal budgets will be based on a projected price for oil and gas. This projected price will determine the initial allocation of petroleum revenues to the constituent unit. When pricing estimates are low, it can result in an increase in the federal government discretionary use of excess or “unexpected” petroleum revenues, some of which can be used to pay down national debt, to build up savings funds, and to fund special projects. Supplementary transfers to the state governments, to compensate for the low budget projections, can happen later, but intentionally under-projecting resource pricing can, in some cases, distort the budgeting process of sub-national governments, and create political tensions around revenue-sharing.

One mechanism that can smooth out the uncertainty of commodity pricing in the budgeting process is a stabilization fund, which is set up by a government or central bank to insulate the domestic economy from large influxes of resource revenue. Revenues above the projected price in the annual budget are directed to the fund, and can be accessed if revenues fall below the budget projections. While the primary motivation of such a fund is to maintain a steady level of government revenue in the face of major commodity price fluctuations, when designed properly for a federal system, it can also have an important role in predictably distributing excess revenues to sub-national governments.

Corruption, Transparency and Accountability

Corruption is frequently associated with resource wealth, especially oil and gas, because it is easier for elites to siphon off large resource rents than to do so with taxes raised from the population. As well, resource companies can be very complicit in corruption as they compete for

access to the resources and seek favourable terms. Corrupt practices include not just private enrichment but also diverting public funds into electoral fraud and illicit party funding. These realities raise the questions of whether federations are more prone to corruption than unitary regimes. Do resource-rich economies (unitary or federal) require a more transparent and accountable form of democracy, with particularly strong checks and balances?

Transparency and accountability are closely linked, but distinct, concepts. Transparency relates to the quality and scope of information available on the conduct of government, whereas accountability is a relationship between government office holders (whether the executive or legislative branch) and those who have oversight of them, whether voters or other office holders. Transparency is a necessary condition for satisfactory accountability. Accountability in federations is of the executive to the legislature, of elected politicians to their electors, and (on occasion) of constituent units to federal governments (e.g. with conditional grants).

While it is hard to generalize about federalism and corruption, it is clear that petroleum wealth increases the risks of corruption, especially in poor societies with limited political accountability. When decentralization is associated with enhanced political accountability, it is strongly correlated with reduced levels of corruption. Transparency International does an annual report which ranks the countries of the world in terms of perceived corruption and federations appear throughout the list, from the best to the worst, suggesting they are no more or less corrupt than unitary regimes.

In fact, the revenue sharing implicit in a federal system can place an additional pressure for transparency, from the subnational governments. While unitary regimes can have various institutional checks and balances to promote transparency and accountability *within* a government, federations can confront the issue of such arrangements *between* governments. As many federations share certain federally imposed and collected revenues with the governments of the constituent units, the governments of the constituent units have an interest in there being transparent reporting on relevant federal revenue collection. At the same time, federal governments have little authority to review how sub-national governments spend their unconditional transfers. Rising resource revenue wealth may create pressures for federations to consider new approaches to transparency and accountability. One model is Brazil's approach of a federally imposed regime requiring fiscal accountability from sub-national governments. Another alternative could be based on mutual checks and balances. Federal governments would give the constituent unit governments a role in ensuring that federal accounts are truly transparent, which would protect the constituent units' rights to revenue shares, while in exchange the constituent unit governments would accede to rigorous transparency with respect to procedures regarding their accounts.

Oil and Gas Management in Federations: Snapshots from around the world.

Just as there is no single model of federal governance, each federal country has developed its own system to manage, develop and share the revenues of its petroleum sector. While there are certainly geographic, economic and cultural similarities between many of the countries, it is clear that any lessons to be gleaned from these federal experiences must be understood and placed within their specific historical context. The following snapshots are by no means intended to provide a complete picture, but rather to sketch an outline of how the resources are owned, managed and shared.

Argentina

As the fourth largest oil producer and second largest natural gas producer in Central and South America, Argentina plays a significant role in the regional hydrocarbons market. At the end of 2011, Argentina had proved oil reserves of 2.5 billion barrel and natural gas reserves of 0.3 trillion cubic metres. In 2011, Argentina produced 38.8 billion cubic metres of natural gas, and an average of 607,000 barrels of crude oil per day.

Mineral rights, including rights to oil and gas reserves, are vested in the nation or in the provinces (depending on their location) and are severable from the general ownership of property. According to the federal Constitution as amended in 1994, natural resources, including hydrocarbon reserves, belong to the provinces in whose territories they are located. In 2007, jurisdiction over all oil and gas fields located in the territories of the provinces, including the territorial sea up to 12 marine miles from the shore, were transferred by the nation to the provinces where the fields are located. Petroleum reserves in the Argentine continental shelf and beyond the 12 miles remain the property of the nation and are subject to exclusive federal jurisdiction.

While the provinces own the resource and levy royalties and license fees, the federal government has used its power to impose an export tax, capturing a good part of the resource rent using an instrument whose revenue proceeds it need not share with the provinces (unlike most other taxes). This has resulted in a reduction in royalties going to the provinces, and contributed to a growing level of intergovernmental tension between the federal and sub-national governments.

Australia

Australia has both offshore and onshore oil and gas resources located throughout the States and the Northern Territory. The oil and gas industry is a major contributor to the Australian economy. Oil production in Australia has increased gradually from 1980, peaking in 2000, and is currently in decline. Australia has vast natural gas accumulations – nearly 70% of the world's natural gas capacity currently under construction is in Australia (approximately 400 trillion cubic feet of estimated reserves.)

Each State and Territory government has jurisdiction over petroleum reserves within their territory. Consequently, the relevant Governments control the regulation of petroleum exploration and production in Australia, not private landowners. Australia has developed a joint management regime for the offshore, though the federal minister retains primacy.

Because of Australia's strongly equalizing fiscal regime, the fiscal benefits received by petroleum producing states are effectively cancelled by the broader approach to fiscal transfers. The federal government makes transfers to the states based on an elaborate calculation of their fiscal capacity and their spending needs. Even the richest states receive the majority of their revenues from the federal government and the effect of federal transfers is to bring all states to essentially the same level based on a national standard of fiscal capacity and expenditure need. Thus for Australian states, having resource revenues can contribute to their degree of fiscal self-sufficiency, but it does not increase their long-term net fiscal capacity.

Brazil

The federal government is the owner of all mineral resources in situ (that is, before exploitation), whether the oil and gas is located onshore or offshore. In the case of offshore resources, the states (especially the adjacent states) and municipalities get most of the revenues.

Oil and gas exploration and productive activities are a federal monopoly, but these activities may be delegated by the federal government to state-owned or private oil and gas companies through the concession regime. Owners of private lands from which oil and gas are extracted have the right to remuneration equivalent to 1% of the annual oil and gas production.

Producing states get a share of all resource revenues based on derivation. The rents are shared in different proportions with these states and municipalities (70% of royalties; 50% of special entitlements; 48% of income tax) and only dividends from Petrobras (Brazil's largest mixed-capital petroleum company) are exclusive to the federal government. Sharing according to the derivation principle has contributed to a growing horizontal fiscal imbalance – petroleum revenues going to the states and municipalities have now grown to over \$7 billion, with over 80% benefitting two states, Rio de Janeiro and Espirito Santo, which are relatively well off compared to the average Brazilian state.

Canada

In Canada, the provinces own, manage and are the main beneficiary of onshore resources. The federal government collects revenues from income tax (projected to be around 50 billion dollars by 2020) while provincial governments collect royalties, license fees and other taxes (an estimated 70 billion dollars by 2020). Although the offshore resources are owned by the federal government, it has ceded by legislation (not constitutionally) the effective management and the revenues of its offshore resources to the two provinces with offshore production.

Canada has an equalization regime that brings the poorer provinces up to a national standard fiscal capacity. The fiscal advantage of petroleum rich provinces, notably Alberta, has normally not been so great as to cause a major political issue. However, the federation was put under considerable stress after the second oil shock in 1979 because of Alberta's soaring revenues which took its fiscal capacity to over twice the national average; the federal government brought in measures to try to gain access to the resource rents (largely through an unpopular export tax). This created severe political tension between Alberta and the federal government, and resulted in a 1982 constitutional amendment that prohibits the federal government from imposing export taxes on petroleum. However, the issue of fiscal balance between Canada's provinces has started to reappear with higher prices, the massive growth in Alberta's production, and the rise of new resource rich provinces.

India

In India, the Union (federal) government manages the onshore resources owned by the constituent units, and receives the majority of onshore resource revenues even though the resource is owned by the constituent units

Producing states received only a share of royalties, and the federal government determines the rate of this royalty. The federal government has an incentive to keep royalties low because they must be shared with the producing states. By keeping royalties low, the federal government has room to collect other levies that it need not share, such as the petroleum profit tax.

The sector is one of the larger contributors to the Indian treasury and an important source of revenue for both the Union and the states. By 2000, revenues to the Union from offshore and onshore oil and gas rose to a peak of 35% of non-tax revenues (about 7% of total revenues). Liberalization of the sector, and macro-economic diversification has seen this share decline to about 10% of the Union's non-tax revenues (2.5% of total revenues). The sector is also an

important source of revenue for some states. In 2005, shared royalties comprised up to 25 % of some producer states' own-source revenues.

Malaysia

In Malaysia, as in India, the constituent units own the onshore petroleum resource, but the resources are managed by the central government. As well, constitutional control of the offshore rests with the federal governments, despite the ownership of the offshore by the Borneo states. This strong centralization reflects the generally centralized character of the Malaysian federation, despite the provinces being “owners” of the petroleum resource. That said, there are other jurisdictional levers that can be important in the management of the resource, including land use permits, which can give constituent unit governments a role in some decisions.

In Malaysia, the federal government receives the larger share (or virtually all) of onshore resource revenues, and shares only the royalties with the producing provinces. The federal government determines the royalty rate (currently 10 percent) and the resulting royalty revenues are then shared equally between the producing state and federal government. Given that the states have such a small share of spending responsibility, even this small amount gives the three producing states a significant fiscal advantage over other states. They also benefit from other transfers that take into account their large area, lower level of development and small population, so that after all transfers, their revenues per capita vary from some 300% to 600% more than the average revenue per capita for the non-producing states.

MEXICO

Mexico has proven oil reserves of over 10 billion barrels (2013) and recent estimates of unproven reserves have reached over 125 billion barrels. Decreasing input and lack of investment has seen Mexico fall from sixth to ninth rank in oil producing countries, prompting the current government of Enrique Pena Nieto to introduce reforms to permit activities of national and international private sector parties in Mexico's hydrocarbon sector, which is currently prohibited by the constitution.

Article 27 of the Mexican constitution specifies that title to all hydrocarbon resources in Mexico belong the Mexican nation, and no concessions or agreements (production sharing) will be granted or executed. Upstream, midstream and downstream petroleum activities are controlled by the Mexican federal government through the National Oil Company (Pemex). The Mexican state has sole authority to undertake exploration and production activities, which can only be performed by Pemex. However, Pemex can enter into exploration and production service

contracts with private parties to perform any kind of exploration and production services. These contracts do not grant these parties any right to the oil and gas, nor to book any rights over reserves. Legislation also dictates that compensation to contractors must always be paid in cash, and no payment in kind will be allowed. Compensation cannot be linked with Pemex's profit levels and cannot be a percentage of the sales of the crude oil extracted

Taxes and royalties from Pemex fund about 35% of the federal budget. Mexico's petroleum producing constituent units get very little fiscal advantage from petroleum production. The federal government pools normal resource revenues with other revenues and its transfers provide no special allocation of these to petroleum producing states. However, when petroleum prices are above the budget reference price, the producing states do receive a small extra share of petroleum revenues, but this has never been of more than marginal significance.

NIGERIA

The oil and gas sector remains central to the Nigerian economy and accounts for about 95% of the country's exports. Nigeria has 37.2 billion barrels of proven oil reserves, making it the largest oil and gas producer in Africa and the 11th largest in the world. Additionally, Nigeria has more than 187 trillion cubic feet of proven natural gas reserves, making it the largest natural gas reserve holder in Africa and the seventh largest in the world.

The Constitution gives the federal government the entire ownership and control of the petroleum resources (including oil and gas) in, under and on any land in Nigeria, as well as under its territorial waters. However, the state governments receive a larger share of resource revenues than does the federal government, with the producing states being especially favoured.

Producing states get 13% of resource revenues emanating from their territory and the adjacent shallow offshore areas. Remaining resource revenues are pooled with all other revenues and allocated according to population, equality of states, internal revenue generation, land mass, terrain and population density. The ultimate result is that the nine oil-producing states receive over 50% of all revenues and have an average per capita allocation 350% larger than the non-producing states.

The Nigerian experience, however, reveals that revenue sharing based on derivation does not necessarily lead to wise use of resource wealth. Many of the producing states in Nigeria have much higher revenues than other states, but have squandered their wealth through vast corruption and waste. The lack of accountability of state governments for their use of funds, is reflected in

low human development indices, a despoiled environment, substandard infrastructure and public services.

PAKISTAN

Pakistan produces about 60, 000 barrels a day of crude oil, but consumes over 400, 000 barrels per day, making it a very large net importer of oil. Recent discoveries have raised expectations that the country will become a larger player in oil and gas – the United States Energy Information Association recently announced an estimate of 105 trillion cubic feet (TCF) of shale gas and over 9 billion barrels of oil - far larger untapped reserves than previously known. Increased resource reserves will also increase macro-economic stability in Pakistan, as the current high level of dependency on oil imports and the subsidized domestic prices have posed the major challenge in managing fiscal cycles, rather than fluctuating revenues from domestic production.

Ownership of the onshore resource in Pakistan is deemed to be joint amongst the federation and the constituent units, although it is managed by the federal government. A recent constitutional change has also introduced joint ownership of offshore resources. Unlike many federations, where resource exploitation takes place in largely unpopulated regions, production in Pakistan is located in provinces that constitute a significant (but still minority) share of the population.

Pakistan shares certain federally imposed and collected revenues with the governments of the constituent units, and has been slowly correcting the vertical fiscal imbalance. In addition to this broader program of equalization, there is a transfer for resource revenues based on derivation. This includes the transfer of excise duty and royalty on natural gas to the provinces in which gas fields are located, and these transfers are not offset against any other revenue distribution mechanisms.

RUSSIA

Like Pakistan, resource ownership in Russia is deemed to be joint amongst the federation and the constituent units, but managed by the federal government. Central control has been asserted after a period of relative decentralization during the transition to democracy, with a progressive modification of the constitution over the last decade that gives the federal government overwhelming authority over the petroleum sector. There is a high regional concentration of resource distribution in Russia in which two tiny constituent units dominate the production of oil and gas respectively, explaining the centralization of government control and revenues in Moscow.

The federal government receives the larger share (or virtually all) of onshore resource revenues even though the resource is owned by the constituent units, and there is no sharing of revenues based on derivation. The constituent units where petroleum is produced get no resource revenues as such, but do benefit from the fact that the general Russian fiscal regime includes a derivation principle for sharing certain taxes so that regions with high personal and corporate income taxes—including the petroleum producing regions—enjoy an advantage. The net result, after factoring in federal equalization transfers, is that the few, small producing regions have revenues per capita comparable to those of Moscow and St Petersburg and as much as five times per capita those of the least endowed regions.

United States

The United States is the third largest oil producer in the world and also produces significant amounts of natural gas. Practically all of these resources are consumed domestically, with the U.S. importing vast amounts of additional crude oil and petroleum products each year to meet demand. Although the upstream sector is a relatively small part of the national economy, the absolute size is huge.

The legal and fiscal regimes governing oil and gas extraction within the United States are varied. Oil and gas rights may be owned by private individuals, corporations, Indian tribes, or by local, state, or federal governments, and these rights extend vertically downward from the property line. Each level of U.S. government is authorized to levy its own taxes and, to an extent, apply its own laws and regulations to oil and gas activity. And although the federal government regulates oil, gas and mining company activities across the country, apart from corporate income taxes, the national government receives fiscal benefits only from resources located on federal lands

Although oil and gas laws vary by state, the laws regarding ownership prior to, at, and after extraction are nearly universal. An owner of real estate also owns the minerals underneath the surface, unless the minerals are severed under a previous deed or an agreement. Once severed from surface ownership, oil and gas rights may be bought, sold, or transferred, like other real estate property.

It is also a system with flexibility, in that producing states have been able to win the right to petroleum revenues from federal lands within their boundaries. Offshore, the federal government owns all resources, but several US states have been instrumental in forcing offshore moratoriums by denying effective land access.

Venezuela

Venezuela has the second-largest oil reserves in the world. The country is highly dependent on petroleum revenues, which the government relies on for an estimated 45% of its income. The extractive industries accounted for 95% of exports and 20% of gross domestic product in 2010.

The constituent units where petroleum is produced get very little fiscal advantage from petroleum production in Venezuela. The federal government typically bases the budget on low estimated prices, which determines the initial transfers to the states; there are supplementary transfers later, but the lag in payments benefits the federal government, especially when inflation is high.

Venezuela's Special Allocations Law provides for general equalization transfers to sub-national governments, as well as an additional redistribution of oil and gas revenues. The former is mandated by a Constitutional requirement that 20% of ordinary fiscal income (both oil and non-oil revenues) must be distributed to the states and the capital district, 30% in equal shares and 70% according to population. Additionally, the federal government is obliged to transfer at least 25% of the fiscal income from petroleum to state and local governments. Of this, 42% belongs to state governments, 28% to municipalities and 30% to community councils.

Conclusions

It has been observed that federations are not difficult to govern because they are federations, but they are federations because they are difficult to govern. As the quick overview of federal country experiences reveals, these difficulties are manifested in many different ways. Some are weakly democratic or have a very chequered history of power-sharing, while others are

established democracies. Some are quite homogenous, while others have deep fault-lines that require flexible solutions and evolving political compromise.

It is clear that a country's high dependence on petroleum creates a strong force for central control of the petroleum sector and federal dominance of fiscal management. On the other hand, federations where petroleum is less central to the national economy show more variety in the allocation of responsibilities between the centre and the constituent units and, in some cases, considerable tolerance of sub-national control.

A review of the tables reveals the varied approaches to the allocation amongst governments of the ownership of petroleum resources, and of responsibility for their management, as well as the determination and sharing of petroleum revenues. While heavy resource dependence usually results in governments playing the central role in managing and taxing the petroleum sector, it seems that this may be less important in those countries with a high standard of living in all regions, or where the sector is a relatively small part of the economy. In fact, permitting local control in such cases may be most appropriate; certainly it has worked in several federations. This flexibility in federalism may be a political virtue, in that it permits countries to configure ownership, management and revenue arrangements in different ways to reflect their circumstances or histories.

Sharing of resource revenues is handled very differently by different federations. While there may be strong arguments for not permitting very large fiscal disparities between regions of a federation, there is clearly political tolerance for some disparity in many federations. Federal arrangements in which petroleum-producing constituent units receive greater share of the benefit than non-productive units may reflect the historical origins of the federation, long-standing constitution arrangements, or a political culture which accepts the country's regional character. By contrast, some other federations have constitutions and a political culture where natural resources and their revenues, including petroleum, belong equally to all.

Federations by their nature are meant to balance national and regional interests and identities. Managing petroleum resources and sharing their benefits and costs must be part of the balance that each federation will find. To this, it is important to develop political processes and regulatory regimes which balance the national, regional and local interests in the activities and impacts of the petroleum sector. Achieving this successful balance will depend as much on the nature of the country—its diversity, its constitutional traditions, its wealth and institutions – as on the resource that lies beneath the ground.

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