

5. The ABCs of Petroleum Contracts: License-Concession Agreements, Joint Ventures, and Production-sharing Agreements

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It is in the interest of natural resource-rich countries to use their resources to obtain funds for social and economic development. To do so, many governments enter into contracts with foreign companies to develop and sell their oil or gas. Negotiating the right contract is vital to a government's efforts to reap the benefits of its natural resources.

This chapter will focus on the different types of contracts that are standard in the industry while also addressing the important public interest concerns that are too often neglected in contract negotiations. By reporting on these issues, the media can help inform public debate about what kind of contracts are best for their country.

Governments have three options to develop their natural resources: They can create state companies for exploration, development, and production, as in Saudi Arabia, Mexico,

Venezuela, Iran, and Oman. They can invite private investors to develop the natural resources, as in the United States, United Kingdom, Russia, and Canada. Or they can use a combination of these two systems, as in Indonesia, Nigeria, Azerbaijan, and Kazakhstan.

Contract terms determine how much a producing nation earns from its natural resources, and often, whether a government will have the regulatory authority to enforce environmental, health, and other standards that apply to the contractors.

A government is expected to use its regulatory power to protect the public interest—to ensure, for example, that oil spills don't damage public drinking water. Yet a host government is also expected to create a positive investment climate that promotes economic and job growth while establishing investment laws and penalties for their violation. Host governments need to learn how to balance these competing needs.

Further complicating matters is the fact that as a signatory to any contract, the government acts like a normal business seeking to maximize its revenues. This places the government in the awkward situation of having to regulate itself. Governments of resource-rich developing countries also face the challenge of negotiating with major oil companies, which have the advantage of employing hundreds of well-skilled legal representatives.

Another reason to focus on contracts is the opportunities for corruption that exist in the huge investment costs and vast profits involved in most energy deals. Because normally so little information is made public about negotiations and contract terms, there is potential for abuse on both sides of the table. Companies bidding for potentially lucrative deals have sometimes made illegal payments, often disguised, to government officials or their representatives to curry favor. It is difficult to determine whether a particular company was chosen for its competitive bid or competence, or its close relationship with a government official. If the government official is also the regulator, the opportunity for corruption is even greater. Criminal investigations involving this kind of corruption have been pursued in Angola, Congo-Brazzaville, Kazakhstan, and elsewhere.¹

Oil Contracts

Though contracts can vary widely in their details, all must establish two key issues: how profits (often called “rents”) are divided between the government and participating companies and how costs are to be treated.

What complicates negotiations is the high level of uncertainty caused by incomplete or even faulty information. Typically, neither the oil company nor the host government knows with certainty at the time of signing the contract how much it will cost to explore and develop a field, whether future oil or gas prices will justify that cost, or how much oil or gas there is in a field. Nine out of ten exploration efforts result in a loss.²

Companies will seek to protect themselves against possible losses, which drive up investors' internal costs. Contract negotiation requires skillful bargaining to find a reasonable and mutually acceptable balance between the interests of an investor and a government. Often, host governments turn to international financial and legal experts to advise them during these negotiations.

One of the first decisions that governments must make is to select the type of contractual system it will use to establish the terms of the development process: a concession or license agreement, a joint venture (JV), or a production-sharing agreement (PSA).

Each form of contract has its advantages and disadvantages, especially from a commercial point of view. The details of the contract can vary greatly even between similar types of contracts. To add to the confusion, the provisions of license-concession agreements and PSAs have also come to resemble each other. Governments and investors should release the terms of their agreements. If they decline to do so, questions need to be raised about the need for confidentiality since there is no intrinsic reason why such agreements should be kept from the public.

Concession or license agreements

Concession or license agreements have evolved considerably since their introduction in the early 1900s as one-sided contracts when many of the resource-rich nations of today were dependencies, colonies, or protectorates of other states or empires.

The modern form of such agreements often grants an oil company exclusive rights to explore, develop, sell, and export oil or minerals extracted from a specified area for a fixed period of time. Companies compete by offering bids, often coupled with signing bonuses, for the license to such rights. This type of agreement is quite common throughout the world and is used in nations as diverse as Kuwait, Sudan, Angola, and Ecuador.

Advantages: The advantages from a developing country's point of view are substantial. First, licenses or concessions are more straightforward than other types of agreements, especially if a public bidding system is used to set basic terms. The degree of professional support and expertise required is often less complex than that needed to negotiate joint ventures or production-sharing agreements. Yet sound financial advisers are still needed to structure the concession bidding system. An acceptable and reliable legal infrastructure, including a judiciary capable of interpreting complex agreements, is also necessary. With a well-developed legal system, as in most industrialized countries such as the UK, Norway, and Canada, a license or concession agreement can focus on the commercial terms without the burden of devising contractual provisions to fill in gaps in the legal system of the host country.

The financial and other terms of the license are set forth in an agreement draft-

Questions about License or Concession Agreements

If your government has entered into a license or concession agreement, there are a number of questions you can pose to better understand the situation. Some of these same questions are also applicable to JVs and PSAs.

- ▶ If the tender terms have not been made public, ask government officials for this information and also ask why the terms were kept secret.
- ▶ How long is the concession valid? How many companies bid? What has the successful bidder agreed to pay? Which outside experts advised the government in designing the concession license?
- ▶ How long is the work program and how much has the bidder agreed to invest? What environmental standards will be adhered to and what agency will police compliance with these standards? Will any residents be relocated to make way for the natural resource development?
- ▶ How will the proceeds be shared between the central government and the local governments?

Questions for Companies

- ▶ How much will be paid for the concession and to whom? Will the terms of the concession agreement be made public? Will company officials publicly confirm that they have not paid, in cash or in kind, any government official or his family or friends for the concession? What are the criteria for choosing local subcontractors?
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ed by the host government which should then be published and opened to a bidding process by competing companies. The successful bidder pays the bidding price—usually the license fee and/or signing bonus—and these fees are kept by the host government regardless of whether oil is found and commercial production takes place.

If commercial production occurs, the host government also earns royalties based on gross revenue and/or a profit tax based on net income, both of which are based on the quantity of production and the price at which the production is sold. All financial risks of development, including the costs of exploration, are absorbed by the successful bidder. In short, there are few serious financial or other drawbacks for the host government, other than the loss of opportunity or the loss of time if the bidding system does not attract an acceptable, financially strong, and technically competent bidder.

Disadvantages: The main disadvantage from a developing country's point of view, as well as from a bidder's perspective, is commercial. There is normally a lack of adequate knowledge about the potential of a concession area because seismic exploration has not been fully undertaken. The result is that the bidding system is often simply an auction.

Oil companies have no choice but to take calculated risks about what price to bid for a license. A company will be cautious in the amount it is prepared to bid since there is no guarantee the concession will cover the company's costs and return a profit. Where knowledge and facts are inadequate, the host government will not maximize its potential return from an auction system. Since the bidding documents specify a minimum work program—a prescribed period of time within which to make the corresponding investments or run the risk of forfeiting the license—potential bidders will naturally be more judicious and conservative in their offers.

For more information about concessions, refer to Box 1 at the end of this chapter.

Joint ventures

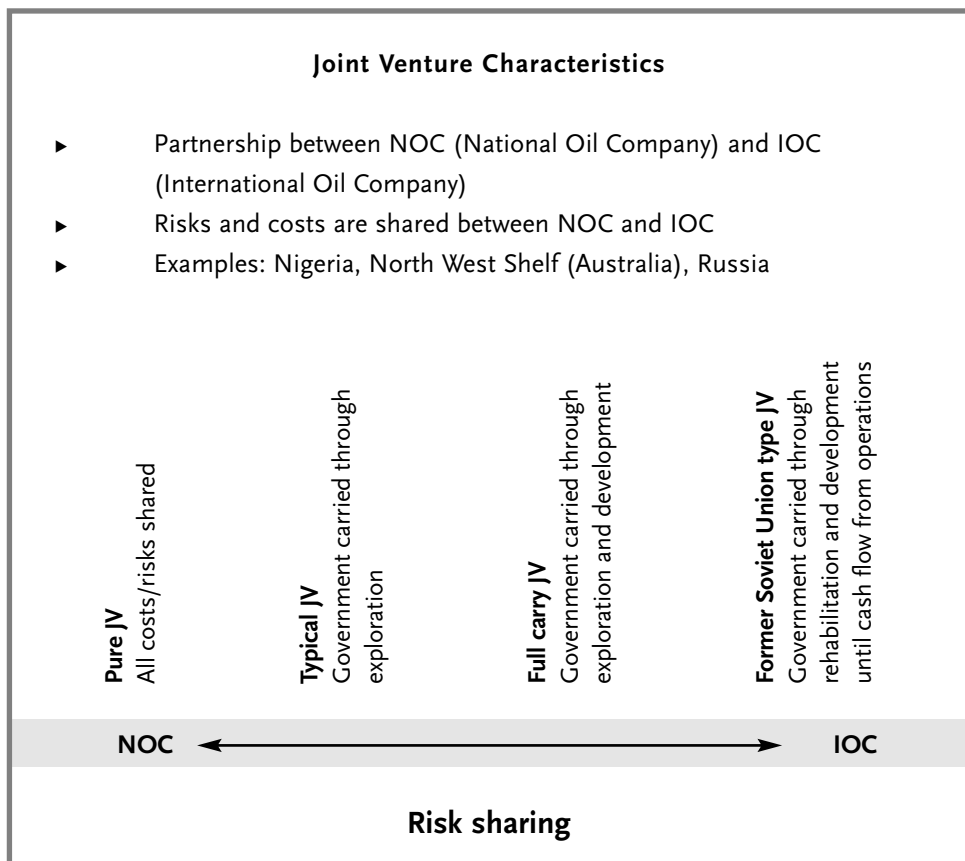
Joint ventures (JVs) defy ready explanation and definition because there is no commonly accepted definition or meaning. A JV simply implies that two or more parties wish to pursue a joint undertaking in some still to be clarified form. A "joint venture can be best understood by comparing it to a modern-day marriage. . . . There is a courtship period. . . . Parties to a joint venture need to know and understand each other's goals, interests and ways of doing business. Without such understanding, it is impossible to draft a workable prenuptial agreement (i.e., the joint venture agreements). . . . The low success rate of modern-day marriage applies equally to corporate joint ventures."³

Given the open-ended nature of this type of structure, it is not surprising that JVs are less commonly used as the basic agreement between an oil company and a host government. Nigeria was an exception: The national oil company favored this format

until it could no longer meet its share of the JV's financial commitments. Now, new agreements in Nigeria are mostly PSAs.

It is in the nature of the JV that the list of issues to resolve is long. Because a JV demands that the parties do things jointly, by not resolving material issues prior to entering into a JV, the parties only postpone a potential disagreement or a stalemate, especially if a JV is a 50–50 deal. JVs require painstaking negotiations over an extended period of time to ensure that all matters are thoughtfully addressed and that the parties agree on how to work with each other.

Advantages: The only advantage of a JV for a government is that it is not alone in the decision-making and responsibility for a project. It can count on the expertise of a major oil company. It will also share the profits, on top of any other remuneration like taxes or royalties.



Disadvantages: Sharing has a downside. Risks and costs must also be shared, making the host government a direct and responsible participant in the natural resource extraction. Responsibility also brings with it potential liability, including for environmental damage.

TIP SHEET

Questions about Joint Ventures

The mere introduction of the term “JV” should provoke journalists to question government and oil company officials.

- ▶ What is the exact purpose of the JV? Is it for exploration, development, and/or operation?
 - ▶ What will each party contribute, e.g., cash, know-how, and/or management? What will each party receive? What is the responsibility of each party, e.g., operation, sales, and/or government coordination?
 - ▶ How long is the JV to remain in existence? What are the agreements that constitute the JV—e.g., establishment agreement, which sets forth the JV governance provisions; operating agreement which sets forth, among other things, how the oil field operations are to be managed?
 - ▶ How is the JV to be terminated or dissolved? Can one party take over the rights of the other party, and under what circumstances?
 - ▶ Why was a joint venture format chosen? The decision to use a JV demands an explanation, if not a justification, of why the host government has agreed to assume and accept the sharing of risks, and the consequent financial liabilities. Every term of a JV is freshly drafted and negotiated; full scrutiny is required of almost every single provision.
 - ▶ What is the government receiving in exchange for taking on these extra risks and liabilities?
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The main disadvantage is that the JV format is inherently ambiguous. It can complicate and intensify negotiations. A JV offers no natural advantage over any other form of agreement and will probably require more extended negotiations. In short, a JV will require much more legal advice from experts in petroleum contracts, which will cost the government and companies more. In addition, JVs take a long time to negotiate.

Production-sharing agreements

The production-sharing agreement (PSA) was first used in 1966 in Indonesia. Even though Indonesia had proclaimed its independence in 1945, foreign oil companies' activities were still based on the *Indische Mijnwet*, the mining law of the Dutch colonial period.⁴ As nationalist sentiment grew, this license concession method was discredited as a legacy of imperialistic and colonial periods. The government refused to grant new concessions and introduced the "Indonesian formula," now widely known as the PSA, in which the state would retain ownership of the resources and negotiate a profit-sharing system. At first, foreign companies firmly resisted this change, afraid it would create a precedent that would affect their concessions elsewhere. However, independent companies entered into PSAs and the majors had no choice but to follow.⁵ PSAs spread globally and are now a common form of doing business, especially in Central Asia and the Caucasus.⁶

The PSA recognizes that the ownership of the natural resources rests in the state but at the same time permits foreign corporations to manage and operate the development of the oil field.⁷

Under a PSA, an oil company carries most financial risks of exploration and development. The state also faces some risk. Often the national oil company joins the consortium as an interest holder in the PSA, contributing some of its profits as "share capital" to the consortium that is developing the area granted under the PSA. Often the host government has the cost of its initial contribution "carried" by the other companies. This carried cost will be repaid to the companies from the host government's future profits under the PSA.

If the government does not agree to contribute to the share capital, then the oil companies will try to negotiate a greater share. The exact split is a result of hard bargaining since there are no scientific determinants of what an appropriate or reasonable split should be.

The financial terms of the PSAs are similar to those of the license agreement, although the differing structures may lead to different commercial results. The host government often earns a signing bonus, although this is regularly waived or traded for a greater share of future profits. The oil company is first entitled to cost recovery for both current operating expenses, expenses for materials consumed or used in the year in which they were acquired, and capital investment—expenditures for assets such as buildings,

PSA Characteristics

- ▶ Started in Indonesia in 1960
- ▶ Work commitment
- ▶ Bonus payment
- ▶ Royalties
- ▶ Recovery of production costs (Cost Oil)

Profits – Cost Oil = Profit Oil

- ▶ Profit oil split between company and host country
- ▶ Overall share of the host country depends on bargaining
- ▶ Developing countries now prefer PSAs

equipment, and computers, which have a longer shelf life. Cost recovery for current expenditures is immediate, in the year in which the expenditure is incurred, and cost recovery for capital investment is spread over a number of years. There are gray areas, where accountants can reasonably reach different conclusions as to whether certain items, such as books and tools, should constitute an operating expense or a capital cost.

What remains after companies have used annual earnings to repay themselves for their operating expenses and their capital investment, as depreciated in that year, is then shared according to the agreed percentage division with the host government.⁸ The foreign company is required to pay taxes on its share, but these are often waived by the host government and included in the company's portion of the agreed percentage split.

PSAs have developed in such a way that today there are many different versions resembling each other only in the basic concept of sharing. This variation is not surprising as they are a product of intense negotiations and the concerns and interests of each party naturally differ with the circumstances.

The complexity of a PSA depends on the soundness of the legal infrastructure of a state. For example, if a country does not possess basic rules governing petroleum operations, the issues normally covered by such a law will have to be addressed in the PSA. In short, the less reliable and/or predictable a state's legal system the more issues must be covered and specified within a PSA.

Advantages for a host government: All financial and operational risk rests with the international oil companies. The host government does not risk losses other than the

Bonuses

- ▶ **Signature bonus**
Paid upon contract signing
- ▶ **Discovery bonus**
Paid upon first discovery
- ▶ **Production bonus**
Paid when production reaches a specified level
 - ▶ Unpopular with oil companies
 - ▶ Oil companies prefer higher income taxes

cost of the negotiations (mainly fees paid to advisers). At most, the host government loses an opportunity but suffers no material loss if an exploration or development project fails. Should a project not be pursued in accordance with the terms of an exploration or development program, a government can still, if the PSA is drafted well, cancel or terminate the deal or bring in another oil company. A host government has the added advantage that it shares any potential profits without having to make an investment, unless it agreed to do so.

If the PSA is enacted into law, it provides legal security for international oil companies—a novel approach used by Azerbaijan and other former Soviet republics. But from the point of view of a government, such an approach turns a contract, which is a flexible instrument that can be changed simply by the parties, into an “inflexible” law, which can only be amended with the approval of parliament. In many cases, the PSA is superior to, or trumps, all other present and future laws with respect to the matter addressed in it. The result is that the government effectively surrenders its right to adopt new laws and regulations in the public interest if such laws or regulations should adversely impact any rights of the oil company under the PSA.

Disadvantages for a host government: The theoretical flexibility of the PSA as an all-in-one document is also a disadvantage. It puts a premium on very professional negotiations and the government having access to technical, environmental, financial, commercial, and legal expertise. In structuring the financial provisions, the government must undertake to assess the reserve potential of the oil fields, even though accurate information may not be readily available. In fact, a host government often has considerably less data and technical and commercial knowledge than the oil companies.

Most importantly, if the host government will obtain a significant portion of its share or compensation directly through profits, the PSA puts the government in con-

flict with itself. It has to balance the desire for higher profits with the enforcement of environmental and other regulations. The cost of environmental compliance cuts into profits. Also, the lower the amount of a company's profits, the less taxes it will pay to the government. However, through the terms of the PSA, the host government is at least passively a decision maker in the development of the oil fields.

At the same time, a host government has granted oil companies, through the PSA, a say in the enforcement of environmental and other standards, when these standards have been incorporated as contractual provisions. A contractual provision can be more easily contested, and even violated, than a statute or regulation. The reason is simple. Breaching the provisions of the PSA, even an environmental provision, is only a contractual violation. The violating party will normally be required only to rectify the breach, perhaps even pay damages. Only if a serious or material breach has occurred is termination of the agreement a possibility.

Moreover, a breaching party could argue that its breach came as a direct result of the action or inaction of the other party. A breach of a contractual provision is an extension of the contract negotiation process, a renegotiation, albeit more acrimonious. By contrast, the violation of a legal statute is an offense, subject to legislatively approved sanctions and penalties and even public condemnation. A contractual breach is a private affair.

In addition, if a PSA has been enacted into law by a country's parliament, it limits the flexibility of both parties and any changes require parliamentary approval. As the PSA is also a contract, ambiguities will have to be mutually settled by the government and the oil companies. By making the PSA a law, as well as a contract, the government has in part transferred some of its responsibilities to the oil companies and surrendered considerable flexibility.

Furthermore, making contracts into law creates a legal infrastructure of one-off, exceptional situations; the investment climate of a nation suffers accordingly. By adopting PSAs into law, Azerbaijan has little possibility of developing a coherent and comprehensive legal system because the PSAs will remain exceptions to any more general or principled laws. In short, the PSA is a form of positive legal discrimination or favoritism for the oil companies. Other investors, whether in tourism, banking or large-scale agriculture, will invariably lobby the host government and parliament for similar special treatment. The net result is legal confusion and a general disrespect for the law.

The government's take

Many contracts require companies to pay the host government a signing bonus. Subsequent bonuses may be contingent on reaching certain stages of exploration or development.

Local investment provisions in a contract may actually be quite costly for a host country because oil companies will request concessions in the PSA for this form of pri-

Government Take in Onshore and Deep Water Conditions⁹

(expressed in percentages)

Country	Onshore	Deep water
Portugal	43.2	39.7
State of Louisiana	69.3	47.2
Thailand	67.0	57.5
Nigeria	84.8	64.2
Malaysia	89.4	68.1
Indonesia	89.8	81.1

vate subsidization of local industry. Most of the time, it is simpler and more transparent for a government to use part of its proceeds to train workers or provide commercial credit for local entrepreneurs.

Since the government is typically the owner of the resource, it is legitimately entitled to keep the major share of the rents. This portion that the government keeps, or the “government take,” depends on a number of factors, including how risky—financially, commercially, politically, and environmentally—the investment is for the companies; the availability of alternative projects for those companies on a world-wide basis; and the prevailing oil market price at the time of negotiations.

The level of government take can increase with a project’s profitability. Thus, where the investment is successful, government revenues can increase without negatively impacting incentives to explore and to produce. In practice however, it appears difficult to design a tax system that adjusts perfectly to the rate of return actually achieved on investment in a project.

The rents from a petroleum deposit cannot be determined in advance so a company will be concerned not only about the overall impact of the tax regime, but also by the way in which the tax burden will be imposed at different points in the field’s life (the tax structure).¹⁰

In order to understand why the level of government take is what it is, the characteristics of each field must be taken into account: Onshore or offshore? Shallow or deepwater? The country’s geological history is also important: Large and relatively mature oil sectors as in Norway? Smaller or newer oil fields as in Azerbaijan? The riskier the investment, the greater the share of profit demanded by companies.

Questions about Production-sharing Agreements

In addition to some of the questions asked about license agreements, journalists should ask government officials how the investors were identified and chosen.

- ▶ Was there a competitive bid?
- ▶ What types of payments will the government receive? Will there be bonuses? When will the bonuses be paid and for what amount?
- ▶ What other types of payments will companies make? What are the conditions? Will the companies be paying taxes, and if so at what rate? Will they pay royalties once production begins?
- ▶ Are the companies obliged to invest in local communities where they operate, for example, by building schools or hospitals? Will local laborers be engaged? Will they be trained? And if the answer is yes, will the government give tax or other financial concessions for such a commitment? Is this commitment an expense to be deducted from profit or a one-to-one credit against tax obligations?
- ▶ How will profits between a host government and the oil companies be shared?
- ▶ How will the costs of environmental damage be treated? Are they a deductible expense? Are they deductible under all circumstances, including negligent conduct by the oil companies? Will the oil companies alone be responsible for such costs? (If the government shares the cost of environmental damage, and its portion of the profit is accordingly reduced, lax enforcement of environmental regulation is often the result.)
- ▶ Ask the government, as well as oil company representatives, to detail local content contractual requirements. (PSAs often contain provisions requiring a specified share of materials and supplies be procured from domestic suppliers. The selection criteria for domestic suppliers should be transparent to ensure that the system is not vulnerable to bribery or nepotism.)

- ▶ How will income and costs be calculated and shared between the companies and the government? (What companies include as expenses can have great consequences on how much the host government earns. In Alaska, legal challenges against the companies' accounting practices brought the state an additional \$6 billion in revenue.¹¹)
- ▶ What are the rates of depreciation, and how do these compare to depreciation practices in other countries? How is the price of oil calculated?

If the PSAs in your country are not public documents, ask the government and company representatives why they refuse to share this information with the public. (Some countries, like Azerbaijan, make PSAs publicly available, but only because those PSAs have been enacted into law and therefore must be published.¹² However, most countries keep these contracts confidential.)

- ▶ If the PSA has been adopted as a law by parliament, does it take precedence over existing and/or future environmental and safety regulations? What are the consequences if the country later adopts stricter regulations concerning oil and gas operations? Are the added costs of compliance for the companies deductible as expenses or does the government have to compensate the oil companies?
- ▶ Does the contract require companies to pay a penalty for damage to the environment? (Some natural gas contracts require companies to pay a price for gas flaring, which contributes to greenhouse gas emissions.)

Certain Contractual Provisions

The concession or license agreement and the PSA have certain provisions in common as they focus on the same subject matter albeit from a different perspective. The following sections examine some of the more common provisions.

Parties. The choice of parties to any agreement should be examined carefully, especially when the parties are from different nations and when one of the parties is a government or a public institution. To the extent that a host government is a direct party to an agreement, it accepts direct responsibility and unlimited liability. But it may limit its liability by engaging one of its own enterprises as a contractual party. There is often confusion between those two related—but separate—legal entities where the state-owned enterprise is perceived as the executive arm of the government.

For example, a host government may agree to provide sufficient electrical power for a project and if it fails to do so, it can be held liable. But if the national electric company, even if wholly owned by the government, agrees to provide the power, then only the electric company will be liable for failure to perform, and only its assets can be seized to cover compensation costs. In general, it is advisable for the government to never serve as a direct contractual partner in a commercial agreement, although this is not always possible. In oil deals, national oil companies often serve as intermediaries for the government.

For these and other reasons, a government should separate its commercial activities from its governmental or regulatory functions. It should not assume contractual liability for exercising regulatory functions.

The oil company partners in any deal with a host government will usually create a subsidiary to serve as party to the agreement. This type of subsidiary will have limited or no assets of its own, and it will not be able to rely on the financial resources of the parent company to stand behind its commitments, especially in regard to damages resulting from environmental pollution. Host governments should require a guarantee from the ultimate parent company of the subsidiary so that the host government has a reliable contractual counterparty with the resources to cover potential liabilities.

Accounting Methods. In order to determine profits, there must be a decision on accounting methodology. The United States, UK, and France each have their own national accounting standards, and the International Accounting Standards Board is in the process of drawing up international accounting principles. Accounting standards leave room for discretion and interpretation, and can lead to serious disputes.¹³

Moreover, accounting standards do not have provisions prohibiting any particular type of expenses. Consequently how certain expenses are to be treated should be clarified in the contract.

Intercompany pricing—what firms with a common owner or common control charge each other for services and goods—is a particularly difficult issue for which accounting standards provide only guidance and no definitive resolution. Intercompany pricing can inflate costs and decrease government compensation.

Recovery of Costs. Companies' costs are important for host government revenues because the taxes that companies pay and the royalties they share with the government are based on the companies' profits. How companies account for their costs determines what profits they report.

There are two types of costs: current operating costs and capital investment costs. Current costs are expensed in the year in which they are incurred and represent an immediate deduction from gross income and an immediate reduction in profits. Capital investment costs are long term and can be depreciated over a set period of time. From a government's perspective, the longer the rate of depreciation, the higher its share of the profits during the time period. A company, on the other hand, will seek to recover its costs as quickly as possible through a more accelerated depreciation. Thus, the terms that the companies use for depreciating assets can have a significant impact on government revenues.

Whether every expense is valid is a different matter. For example, are bonuses paid to expatriate employees as compensation for working in the host country a valid expense? Is the import of a foreign wine for expatriate employees a necessary expense? Should air travel be limited to economy class? A detailed expense policy is necessary.

Capital investment, whether for drilling rigs and other longer-life or "permanent" investments, is significant. Since they are useable over an extended period of time, they should be depreciated or expensed over time. The oil companies prefer to recover these costs immediately and expense them fully in the year in which they are incurred in order to lower profits for that year and pay less tax and less profit to the host government. If the government allows a rapid depreciation of capital investment, an oil company has less to lose should it decide to discontinue operations. After all, the company will already have recovered the majority of its costs.

Taxation or Compensation. The question of how to tax production is an extremely important issue as income earned from the production and sale of a natural resource often accounts for the biggest portion of the government budget. But if the government taxes too much, it runs the danger of pushing companies out of the country to areas that offer better terms.

There are several different types of taxes the government can apply. The first is a profit tax that can come in the form of a corporate income tax or can be subsumed as part of the amount the government agrees to take from any profits. Tax inspectors col-

lect data on production and sales volume data and the price at which the product is sold, and the inspectors audit company expenses. Oil sold to a company's subsidiary in another country may be priced lower or higher than prevailing market prices. In countries where tax administration is weak, this kind of transfer pricing can create opportunities for tax evasion.

Another tax often imposed on oil companies is a royalty, or excise tax, which is normally a percentage of the value of the production, although it can be a set fee based on volume or quantity. This tax is often imposed on top of other taxes. Governments like these taxes because they are easy to administer, in contrast to the corporate income tax, and their collection does not have to wait until the project becomes profitable. On the other hand, these taxes can be inefficient because they tax production without any regard to profit. When the project is marginal or not competitively profitable, the royalty or excise tax may discourage further investment.

Bonuses are another source of revenue that are easy to administer. A host country can require a one-time payment before the company starts exploration (signature bonus), or continued fixed payments once production reaches certain levels (production bonus). Bonuses are fixed payments and do not take into account the success of the project or its profitability; they are usually tax deductible.

Norway designed a sophisticated system that adapts relatively well to the stage of development of a project, and awards the government a significant share of the oil rents. The tax rules are based on the ordinary corporation tax (28 percent) and the addition of a special petroleum tax (50 percent). Both taxes are based on the companies' net profits, and all expenses relevant for the activities on the Norwegian continental shelf are tax deductible. Investments are favored by a high depreciation rate. In addition, an uplift allowance lets a company deduct 30 percent more than it invests against the special tax. For example, if capital expenditure is \$100 million, the company can recover \$130 million. Thus, the Norwegian petroleum tax system is favorable for marginally profitable projects because the uplift allowance will shelter profits from the full effect of the special petroleum tax.¹⁴ But it should be noted that Norway has extensive experience in managing a natural resource tax system.

Environment. Each government has an obligation to protect its environment. However, where environmental standards are covered by PSAs and license-concession agreements, environmental rules and regulations can be ambiguous, giving oil companies the right to interpret, negotiate, or even veto, albeit indirectly, environmental standards. For example, the PSA for Azerbaijan's major oil development project allows the contracting companies to discharge air emissions "in accordance with generally accepted international petroleum industry standards and practices." The problem is that there are none!

Moreover, if an environmental standard is simply a contractual provision, then

companies, together with the government, are also interpreters of that provision and effectively can exercise a veto. It is standard for an agreement to provide that parties shall mutually interpret or agree on the meaning of unclear terms, which means the consent of both parties is required.

Developing countries, if they are lax on environmental standards and their enforcement, indirectly subsidize the cost of a commercial commodity by permitting their environment to be despoiled.

Environmental standards are generally higher in Western countries, but there is no rational reason why they should be, especially in the oil and gas industry, where the commodities are in such demand. The problem arises when oil companies, avoiding the stringent environmental standards in one state, take advantage of more lenient legislation in other countries to discharge, for example, their toxic drilling mud.

Oil companies prefer to pay a relatively low penalty for noncompliance with environmental standards rather than invest in costly pollution monitoring and control. Fines should be high enough to act as a deterrent. Companies usually have an obligation to restore the area upon completion of a project. While some countries like Germany strictly enforce this, other nations employ less stringent requirements.

Work Program. A work program detailing a company's exploration or development plan can be murky, often hiding behind technical and financial considerations, including how to drill in deep water or earthquake areas. In that regard, questions concerning how to best protect the natural environment also become an issue, partially because of the cost of installing the necessary protective equipment.

Often an oil company will slow down certain projects it deems too expensive, especially in comparison to other projects that it may be developing in another part of the world. As such, the host government should insist on a work plan that specifies clearly the circumstances under which a project could be delayed or even discontinued and the circumstances under which it may not.

Stabilization. Stabilization provisions protect oil companies from governmental or legislative changes affecting any contract term and grant them compensation from the host government for any added costs due to future legislative changes, unless otherwise agreed.

Originally, stabilization clauses addressed specific political risks that could affect the contract. In developing countries, the greatest worry was that the host government would nationalize the investors' assets or terminate the contract by unilateral decision.

In the 1970s, there were several disputes between foreign investors and Libya following the nationalization of the oil companies' interests and properties in that country. The arbitrating court decided that Libya's unilateral decision to nationalize

the oil companies' interests was a breach of contract that gave rise to liabilities and required remedy.

A stabilization clause is extremely disadvantageous for the government which "agrees" to it because it freezes the legal and regulatory situation of the country for an extended period of time and requires the government to pay compensation if changes affect an investor.

The stabilization clause must be closely analyzed from a time perspective: what does it mean today and what will it mean tomorrow?

Price. How the market price of oil is determined is critical as it directly impacts the compensation of the host government, whether in the form of taxes or profit sharing. The only objective method to calculate the selling price of oil is to start with the price established by the spot market in the particular region. Platts, an oil pricing service owned by McGraw Hill, publishes a comprehensive list of commonly traded crude oils and their daily market prices. Normally, a contract would specify what prices would serve as a benchmark.

What should never be accepted without question as an acceptable contract price is the price paid between related companies because that price is determined internally and will not necessarily reflect market rates.

A related company is not just a company that is partially or wholly owned by the same company. It can also be a company that has contractual or other ties with the selling party, relationships that are not necessarily public or obvious. The danger for governments that tax companies based on what the companies report as the price of oil sold to subsidiaries is that this price may be well below market rates. Even a marginal difference in price per barrel, can make a considerable difference overall.

Termination. A contract needs to address under what circumstances an agreement can be terminated. Agreements can be terminated, for example, for repeated environmental violations. Termination should also result if companies are no longer developing the field. At that point the host government could transfer the contract to another company that is still willing to develop the field.

Outside Experts. In negotiating contracts, developing countries usually must rely on foreign experts, including, ironically, some from the international energy companies. Relying on oil and gas companies for their expertise is inevitable as no number of government officials, even if they had the expertise, can oversee every aspect of natural resource development. Outside experts must be evaluated, selected, then managed and directed. A nation's experts need to be truly independent so they can be true advisers and advocates.

Conclusion

As oil contracts are necessarily complex and can be subject to abuse and corruption, these contracts, as well as any subcontracts and any regulatory terms, should be fully disclosed and made public. Only then can the public effectively judge the efficacy and soundness of these agreements and the decision-making of public servants and government officials.

6. Protecting Developing Economies from Price Shocks

Randall Dodd

The fact that resource wealth can hamper economic development is by now well known. Less well known are the possible policy measures that governments can take to make oil revenues more stable and to promote economic growth and development.

Briefly restated, the resource curse occurs when a country's abundance in natural resources causes a distortion in its economy resulting in its resources being used less efficiently and leading to lower investment and growth prospects (especially in manufacturing and other tradable goods sectors). The economic distortion can surface in the form of corruption, an overvalued exchange rate, excessive foreign borrowing, unsustainably high wages, and profligate spending by governments. These challenges are described more fully in chapter 2.

Solving these economic problems will usually require governments to adopt and maintain good financial management.¹ Other policy solutions might entail the use of special financial institutions and financial instruments. This chapter focuses on these financial institutions and instruments that can be helpful in managing one of the great

challenges facing economic development: how to manage the commodity price volatility in a country that is dependent on revenues from the sale of its natural resources.

The price of oil and gas is highly variable and does not necessarily follow normal business cycles. This variability creates an economic cost that is borne by the government as well as the private sector. It makes planning extremely difficult for governments when their revenues are highly dependent on natural resource revenue.

Oil Revenue Dependence for Some Major Exporters, 2000

Government hydrocarbon revenue as a percent of total revenue

Angola	90%
Equatorial Guinea	88%
Oman	85%
Nigeria	82%
Saudi Arabia	79%

Source: IMF staff estimates and U.S. Energy Information Administration

Variability in commodity prices makes it difficult to maintain budget discipline. When resource prices suddenly rise, governments tend to increase spending, and this can lead to inflation and waste. Even more damaging is when prices suddenly fall. Governments then face the choice of either cutting spending, raising taxes or finding some alternative source of revenue, or borrowing. Each has its own risks. Cutting spending and raising taxes is difficult to do quickly, it creates a contractionary force in the economy, and it usually falls disproportionately on women and the poor. It can also lead to political unrest. Borrowing abroad is neither cheap nor easy because it occurs at a time when the government's revenues from oil or other resource wealth are low and its creditworthiness poor. In short, prudent fiscal budgeting under this kind of volatility is difficult. It requires governments to build their entire budget around an assumption about the price of oil that could prove entirely wrong.

There are numerous financial institutions and instruments that can reduce governments' exposure to the risk stemming from this price volatility. Financial institutions such as stabilization or savings funds can act as a reserve to cushion the budget. Alternatively, hedging instruments such as futures, options, and other derivatives can protect governments by shifting some of the risk to investors willing to bear it. Reducing risk, however, comes at the cost of giving up some revenues when the price of oil or gas is unexpectedly high, and governments are not always politically ready to give up that windfall.

Policy Remedies

In his novel *East of Eden*, the American writer John Steinbeck described the unreliability of natural resource wealth generated by farming. He described how the rain would come in cycles with several wet years followed by several dry years. During the wet years the land was rich and fertile, and the people grew rich and prosperous. During the dry years the land was bare and desolate, and the people became poor and often moved away. He concluded: “And it never failed that during the dry years the people forgot about the rich years, and during the wet years they lost all memory of the dry years. It was always that way.”

But it does not have to be that way. Appropriately designed and implemented public policies can stabilize the income from resource wealth so as to avoid these types of problems and promote prosperous—rather than unproductive—behavior.

Managing the Economic Impacts of Price Volatility

Variability in prices for natural resources can come from the opening of new oil fields, a relaxation of OPEC production quotas, or commercialization of new technologies that result in a price drop. Conversely, a restriction of OPEC quotas, political unrest in an oil-exporting country, rising demand for oil, war, terrorism, or nervousness among traders can all contribute to an increase in the price of oil.

One of the direct ways that price volatility can act as a curse to developing countries is through its impact on their government budgets. When the natural resource price rises, government revenues increase accordingly. Greater revenues from rising natural resource prices can be used to lower budget deficits, increase spending, or some of both. When the price falls the opposite happens and larger budget deficits are the most likely outcome. Unless governments find ways to mitigate this volatility, they are vulnerable to the “stop and go” pattern of pro-cyclical spending: governments increase spending when market prices for oil rise and cut spending when oil prices fall.

One immediate result of a sharp drop in resource prices is to reduce the ability of a developing country to make prompt payments on its foreign debts. In the autumn of 1998, after the price of oil fell from \$21 to \$13 a barrel over the previous nine months (a 38 percent drop), the Russian government declared a moratorium on foreign debt payments, triggering a financial crisis of global proportion.

Significant price changes can cause other important economic problems. Long-term plans can be disrupted; governments, businesses, and individuals can be forced

to curtail spending. This in turn will lead to fluctuations in other spending, investments, and living standards.

The table on page 91 provides examples of 10 countries whose Gross Domestic Product (GDP), export revenue, and government revenues are highly correlated with changes in the price of the country's major export commodity (second column). The data in the table are the correlation coefficients between changes in the international prices for the commodity, and changes in the countries' GDP, export earnings, and government revenue between 1989 and 2002 (export values are converted to U.S. dollars). The data show how closely these countries' key economic indicators are tied to international prices, over which the countries have little control. An additional example is Mexico where oil accounts for 10 percent of its exports but 40 percent of government revenues.

In order to protect themselves from these fluctuations in the price of their natural resources, developing country governments can use derivatives instruments to hedge against adverse price movements. Hedging is a means of sharing the risk of price volatility with investors. If government budgets are not protected from these price fluctuations, then the price changes are likely to be transmitted throughout the economy.

There are numerous ways that governments that rely on natural resource revenues can use hedging techniques to reduce their exposure to changes in the price of these commodities. The three key techniques are 1) stabilization and savings funds, 2) commodity bonds, and 3) hedging through the use of derivatives.

1) Stabilizing the Effects of Resource Wealth

Some of the ways in which natural resource wealth becomes a curse is through its impact on individual and government spending behavior, and its macroeconomic impact on exchange rates and international trade competitiveness. For example, a large inflow of foreign exchange can put upward pressure on the value of a country's currency in foreign exchange markets. This leads to a decline in the price competitiveness of the country's domestically grown and manufactured goods. The corresponding decline in the manufacturing and agricultural sector is known as Dutch Disease.

One way to prevent or substantially diminish the harmful effects of a sudden increase in wealth is by establishing financial institutions that will prudently manage the newfound wealth over time. Examples of such social trust funds are stabilization funds and savings funds.

Stabilization fund

The basic economic lesson for stabilization funds is as old as the Bible. The story of Joseph describes how Joseph advised the leaders of Egypt to conserve output during a

TABLE 1
Correlations with Major Export Commodity Price

<i>Country</i>	<i>Commodity</i>	<i>GDP</i>	<i>Exports</i>	<i>Revenue</i>
Burundi	Coffee	-0.55	0.44	1.00
Colombia	Oil	0.05	0.30	0.62
Ethiopia	Coffee	0.44	0.33	0.36
Ghana	Cocoa	0.75	0.22	0.72
Kazakhstan	Oil	0.65	0.90	0.44
Nicaragua	Coffee	0.48	0.40	0.48
Nigeria	Oil	0.30	0.66	0.11
Uganda	Coffee	0.65	0.52	0.64
Uruguay	Beef	0.20	0.00	0.45
Venezuela	Oil	0.01	0.71	0.50

— GDP and Revenue in real 1995 local currency values

— Exports in nominal U.S. dollar values

— International Financial Statistics, 1989-2002

Correlation coefficients measure the degree to which variables move together. A value of one means that the two variables move perfectly in tandem, negative one means that they move in the exact opposite directions, and zero means that they move independently of one another. A value such as 0.5 means that half the movement of one variable can be explained by or associated with a similar movement in the other variable. Thus if prices rise or fall by 10 percent then budget revenues can be expected to rise or fall by half that rate, or 5 percent.

period of seven bumper harvests—called the “fat” years—and then to dispense the inventory during future “lean” years. This inventory management stabilized Egypt’s income over time and contributed to its peace and prosperity.

Stabilization funds are designed to accumulate funds when resource prices exceed a target level and to dispense funds when the price falls below the target level. In doing so, stabilization funds take income away from current spending when high commodity prices generate windfall gains, and they make additional income available when low resource prices would otherwise create budget deficits. Consider the example of a government setting its benchmark price at \$30 per barrel of oil. When the price of oil is above \$30/barrel, the excess income will be transferred to the stabilization fund. When the price of oil falls below \$30/barrel, the difference will be transferred from the stabilization fund back to the budget.

In order to be effective, stabilization funds require two types of budgetary protections. The first is a requirement that surpluses in the stabilization fund not be used as collateral to increase borrowing and thereby offset the stabilization effect by increasing deficit spending. Without this requirement, government spending would not be damp-

ened during a boom period. There is little point in saving money if the government is simultaneously incurring debt as well as potentially paying interest that exceeds the returns it is making on its stabilization fund. The interest cost on the new debt would also put a burden on future income when commodity prices might not be so high.

The second protection, which is important when prices are depressed, is one that guarantees the fiduciary integrity of the fund so that it is not raided for short-term reasons. The stabilization fund is designed to pump designated amounts of money into the government budget when commodity prices fall below their target. But sometimes governments exert great pressure on fund managers for additional resources. In order to protect the fund's savings for future stabilization purposes, it needs to be managed by leadership that is professional, protected from immediate political pressures, and ultimately representative of the people served by the fund. One way of doing this is to have a commission or board appointed by the legislative body to terms of intermediate length that expire at staggered years in the future.

An example of a successful fund is Chile's Copper Fund. Established in 1985, its savings are held in an account at the Central Bank and its management comes from an independent board (which includes members from the state-owned copper corporation CODELCO.) It has been credited with helping the Chilean government avoid fiscal deficits. A poor example is that of the Macroeconomic Stabilization Investment Fund (FIEM) of Venezuela, where the lack of strict budget rules has allowed the government to borrow against accumulated assets in order to increase spending as well as to delay scheduled payments into the fund. The result is that the FIEM has only \$700 million in reserves² (even though oil prices have been very high), and that its effectiveness has been diminished.

In addition to stabilizing government budgets, a successful stabilization fund can also protect against Dutch Disease by preventing currency appreciation. This is accomplished by investing the fund's savings in foreign currency denominated securities in order to reduce the pressure to increase the value of the country's currency.

An effective stabilization fund can transform a nation's resource wealth into a stabilizing force in the economy. There is, however, a limit to this policy strategy. It is premised on the assumption that the "fat" years will come first. Unless the fund can borrow against future income, then it cannot begin to exercise a stabilizing influence on government budgets until resource prices have first exceeded the target level. Therefore the fund has the additional political burden of having to first act as a drag on the economy before it can act as a stimulus.

Savings fund

A savings fund is different from a stabilization fund in that its primary purpose is to save money for the future. It can either save for a "rainy day" when the government is in dire need of funding, or it can save for future generations. This is especially desir-

able for nonrenewable natural resources that might otherwise be exhausted by current generations. The assets in a savings fund form a trust, and the income on the trust can be paid out over time. One example is the Alaska Permanent Fund, created in 1977. By the end of 2003 it had accumulated over \$28 billion in assets. These assets generate income that is paid to all Alaskan citizens.³

2) Commodity Bonds

A bond (or note) is a debt security issued by a corporation or government in order to raise money. A conventional bond consists of regular annual or semiannual payments of interest (known as coupon payments) and a final payment of the entire principal upon maturity. For example, a 30-year, \$1,000 U.S. Treasury bond with a 5 percent coupon rate will yield semiannual coupon payments of \$25 (based upon 5 percent of the bond's principal) and then pay the full \$1,000 principal at the end of 30 years. The price of conventional bonds is determined by the present value of all the future coupon and principal payments. Since future payments are worth less than current payments and payments in the far future are worth less than those in the near future, the bond's value is determined by properly discounting the future payments so as to arrive at their present value.

Commodity-indexed bonds

Commodity bonds are different than conventional bonds because they are structured so that either their coupon payments or principal payment are adjusted according to a specific underlying commodity price. For instance, an oil commodity bond might have its principal set to equal 1,000 barrels times the market price of oil at the time of maturity. At \$25 a barrel it amounts to a \$25,000 bond. If the price of oil were to fall to \$20, then the borrower who issued the bond would only have to repay \$20,000. Thus the borrower will obligate to repay less money at maturity if prices are low than if prices are high—this shifts oil price risk from developing country borrowers to investors.

In the event the price rises, the same government will have to make higher payments. But presumably the government will be in a better position to make these larger payments because its claim on the income stream from the nation's oil exports also will be larger due to the oil price increases.

This type of commodity-indexed bond can be thought of as a conventional bond with an attached derivative that converts either the coupon or principal payments into payments based on the price of oil. The single principal payment would be the economic equivalent to a forward contract and the series of coupon payments would be the economic equivalent of a swap or a series of forward contracts.⁴

Commodity-linked bonds

Another version of a commodity bond links the coupon or principal payments to the price of the underlying commodity through an attached derivative called an option.⁵ An option generates a payment only if the price of the referenced commodity rises above (or alternatively, only if it falls below) a specified target price known as the “strike” or “exercise” price. For example, a call option on 1,000 barrels of oil with a strike price of \$50 a barrel will generate a payment equal to one thousand times the extent that the market price exceeds \$50.

In this case of commodity-linked bonds, the coupon or principal payments might be structured to fall if the oil price fell below the target or strike price but would not rise if prices exceeded the strike price. In order to shift the downside risk of oil prices to bond holders, the borrower would need to pay a risk or insurance “premium” to bond investors in the form of a high bond yield. Thus the bond’s price and coupon yield would reflect the fact that the borrower would be holding an option that allowed it to make lower payments in the event that oil prices fell below the strike price. The bond investors would pay a lower price or receive a higher coupon rate on the bond in exchange for their risk taking.

Commodity-linked bonds are usually of two basic types. Bonds with a “short” put option provision—as described above—give the borrower the right to pay the lower of a specified cash payment or one determined by the commodity price if the price falls below the strike price. This type of commodity-linked bond shifts the downside risk of resource prices to the foreign bond investor. Bonds with a “long” call option provision give the bond investor the right to the higher of a specified cash payment or one determined by the price of the commodity if the price exceeds the strike price. In this instance the bond investor would share in the upside gain from higher resource prices, and the developing country borrower would benefit by borrowing at a lower interest rate.⁶

While all these types of commodity bonds can serve to help developing countries to transfer some of their exposure to commodity price risk, it can be expensive. Commodity bonds, whether an attached forward contract or option contract, are more complex than conventional bonds. In financial markets, complexity is more costly than simplicity. Moreover, in the commodity-linked type of bond with a short option position, the options premiums are an additional expense—borrowers pay this additional expense in the form of higher coupon yields. In all cases, however, the developing country borrowers will pay higher yields on bonds that are more complex. Yields will be higher still on bonds that give the borrower the option to pay lower coupon or principal payments if the commodity price drops and that must be sold to the subset of foreign investors who are also willing to take on a long-term commodity price risk.

3) Hedging Using Derivatives

Stabilization funds and commodity bonds are two risk management strategies. Yet another policy approach, and one which addresses the problem more directly and does so with potentially less expense, is to use derivatives to hedge the commodity price exposure.

There are a variety of derivative instruments available in the market. Some are traded on futures exchanges (mostly futures and options type contracts) and others are traded in the over-the-counter (OTC) market (forwards, options, and swaps).⁷

While the exchange-traded contracts are mostly short-term, they can be effectively rolled over from one month to the next in order to provide an effective hedge over a long period of time.⁸ Roll-over involves selling a futures contract that expires in one month and then buying it back before it expires and selling another one that expires in the month after that. For instance, a hedger would start in January by selling a February oil futures, then buy it back before expiration and sell a March futures, then buy it back before expiration and then sell an April futures, and so on. This approach has its skeptics, who worry about the risks associated with the roll-over process. While roll-over risks, such as basis risk and market illiquidity, are real, they have proven over time to be small and manageable in comparison to the risk of not hedging. Moreover, many multinational oil corporations, global agricultural corporations, and other businesses regularly use this technique as an inexpensive and effective hedge against price risk.

An important variation on this approach comes from the Australian Wheat Board.⁹ It promises participating farmers a minimum price for their crops, thus essentially giving away put options to participating farmers, and then hedges its exposure to this agricultural program by selling wheat futures on futures exchanges. As recently as the late 1990s, the Australian Wheat Board was the largest participant in the wheat futures market on the Chicago Board of Trade.

Hedging with futures or forwards

Hedging works to reduce risk in the following manner. Consider the simple case of a country in which the production and export of oil amounts to the total national output and export volume. A 20 percent rise or fall in the price will raise or lower its output and exports by 20 percent. A country can hedge against this shock by taking a “short” position in oil. For instance, it can sell oil in the forward market. A short forward position requires that a certain amount of the commodity be sold for a specific price at a specific time in the future. If oil is sold forward on January 1 for delivery on December 31 at \$25 a barrel, then a \$5 decline in oil prices will generate a \$5 profit for every bar-

The Seesaw of Hedging

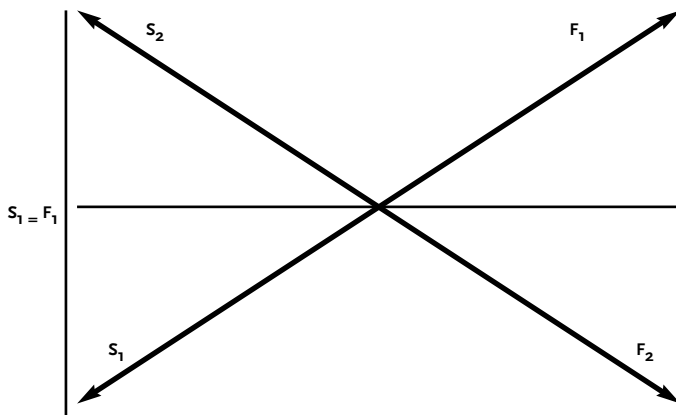
The following are examples of considered existing risks. Farmers face the risk that the price of their crop will fall between the time they have decided to plant and the time they harvest and get the crop to market. Governments of oil-producing nations face the risk that the price of oil will decline over the budget year whereas the governments of oil-importing nations face the risk of oil prices rising.

Hedging is best defined as the reduction of existing risks. In contrast, speculation is best defined as engaging in activity that adds to existing risk.

Existing price risk can be reduced by using derivatives to hedge—a process sometimes called risk management—by entering into a derivative contract that will offset losses on existing risk (and also likely offset gains on existing risks). The value of the derivative used for hedging should change by equal amounts—but in the opposite direction—from that of the existing price risk. For example, a country exporting a billion barrels of oil faces the risk of losing \$1 billion for each dollar decline in the price of oil. It can hedge that risk by selling oil futures on the New York Mercantile Exchange whose value will increase by \$1 billion for each dollar decline in the price of oil.

The relationship of the existing risk to the value of the hedge can be thought of as financial version of the child's seesaw or teeter-totter. One end rises in direct proportion to the other end falling; if no one moves then both ends are equal along a horizontal plane. The following graphic illustrates this concept by showing how when the value of the spot position, i.e., the crop or oil ready for export (S), rises, then the value of the futures position (F) falls, and vice versa. In both cases, the sum of the two positions remains the same at the fulcrum of the seesaw.

Hedging: Sum of change of existing price risk and hedge is zero, or $S = F$.



rel of oil covered by the forward contract. However, if the price of oil were to rise by \$5 per barrel, then it would generate a \$5 loss for every barrel covered by the contract.

Hedging will generate gains when prices fall and losses when prices rise, thereby offsetting the effects of a rise or fall in the revenue from resource sales. This will reduce the variability of budget revenues due to price volatility. This will help prevent pro-cyclical fiscal policy and allow the government to serve a more counter-cyclical role in stabilizing economic performance and promoting sustained growth. Moreover, everyone will know in January that the value of output and exports will be, for example, \$250 million by year's end; the government will know that it will have these funds available (no matter what happens to oil prices) to pay its foreign debt or other obligations.

Hedging through derivatives can be conducted with either futures, forward, or swap contracts.¹⁰ Both futures contracts and forward contracts are an obligation to buy or sell a specified quantity of a specified item at a specified price at a specific time in the future. The difference is that futures contracts are standardized, publicly traded, and cleared through a clearing house. A country's oil products may not be the same as the standard ones traded on most major exchanges. If the different grade of oil means a substantial difference in price variability, then the government may enter into a forward contract in the over-the-counter (OTC) market. These are customized contracts traded through derivatives dealers (usually major banks or broker-dealers). OTC transactions provide certain benefits: they allow parties to tailor contracts to their needs, and they do not require initial collateral or margin. OTC transactions also have some drawbacks: they do not occur on official exchanges and so they are less transparent and they are not guaranteed by an exchange clearing house—thus exposing the hedger to credit risk from the derivatives dealer. Also, the OTC market is not well protected against fraud and manipulation while the exchanges are policed by the government and the exchange itself.

The advantages of hedging through derivatives are that it is inexpensive, it is a reversible policy (that is, the government can decide to lift its hedge), and it does not depend on the “fat” years coming first. It allows the government to borrow through conventional debt instruments instead of paying a premium to tap into smaller pools of investors willing to invest in commodity bonds. Unlike stabilization funds, hedging through derivatives contracts neither tempt corrupt officials nor act as a target for those seeking easy funding for new or expanded programs. The disadvantage is that futures contracts give up the gains of price increases. A solution to this problem is to hedge over a limited two- or three-year horizon rather than a longer period or to hedge only 75 percent or 80 percent of the price exposure so that the economy “feels” some of the effects of the price changes.

Options hedging

If the government does not wish to use either futures or forward contracts and thus give up the potential gains from a sudden rise in oil prices, it can use options instead to buy itself “insurance” against a drop in prices.¹¹ With options, the government pays a premium to the option seller or “writer” that guarantees a minimum price for the oil. For example, a government may determine that it will run into serious financial difficulties if the price of oil were to drop below \$25/barrel. The government would hedge against this possibility by buying a “put” option with a strike price at \$25/barrel. If the price remains above \$25, then the option is not exercised; but if the price falls below \$25, then the options writer would pay the difference between \$25 and the lower market price of oil. This protects the government on the downside, and the investor would absorb the loss.

The option serves as an insurance policy against a fall in the price of oil, and so it follows that insurance against a highly volatile price is worth more than insurance against a very stable price. So the option’s premium is higher for more volatile commodities like oil than for less volatile items like short-term interest rates. This is akin to higher auto insurance rates for risky drivers. In order to attract investors to accept the risky side of this one-way bet, governments will need to pay a premium that reflects the risks from volatile oil prices. These options premiums can prove very expensive. The advantage, however, is that if the price of oil rises, the government will be able to reap the benefits.

Hedging experience

There is little public information about the extent to which petroleum-exporting countries use hedging instruments to mitigate their risk. While some oil producers, such as Mexico and the state of Texas have used such instruments successfully, market analysts agree that the use of hedging by developing countries is still rather limited.¹² There are a number of reasons why developing countries may refrain from government hedging, despite the financial advantages.

- ▶ The primary objection may be a political one. If a finance minister hedged against a low oil price through using futures contracts, and the market price of oil in fact rose, then the country would fail to reap the benefits and few people would commend the minister for his or her prudence. Instead, it would be politically difficult to explain why the government missed out on the higher oil revenues. Conversely, if the finance minister did not hedge, and the price of oil plummeted, the government could shift blame away from itself by blaming international markets. If the finance minister chose to pay a premium for put options to protect against unexpectedly low prices, the minister could be blamed for “wasting” money rather than spending it on more urgent social needs. In

- sum, governments may find it difficult to explain hedging policies to their public.
- ▶ Hedging can also be expensive. All derivatives transactions incur transactions costs that include commissions, paying the bid-ask spread to dealers, and the capital costs of posting collateral or margin. Also, options premiums can be very expensive and the expense increases with the volatility of the commodity price and the time horizon over which the government wants to hedge.
 - ▶ Hedging is complex and requires considerable skill and institutional capacity. Commodity risk management tools require a greater level of financial sophistication than that traditionally required by government officials. Expertise is required to understand the risk structure of transactions, to identify risk management strategies, and to enter into and monitor hedging transactions. This expertise is readily available, however, by contracting with commercial risk managers or through the technical expertise provided by institutions such as the World Bank and the United Nations Conference on Trade and Development.

Conclusion

While hedging can provide protection against commodity price volatility, it cannot prevent the problem of corruption, which is so common among petroleum-producing countries. One way to reduce the incidence of both gross fiscal mismanagement and corruption (meaning the outright embezzlement of funds and the misdirection of funds for political purposes) is to require a high degree of transparency in government budgets.

In order to put pressure on governments to make their budgets and budgeting processes more transparent, several hundred nongovernmental organizations have embarked on an advocacy campaign called Publish What You Pay to get corporations to report on their costs for royalties, rights, and all other payments to developing country governments for the extraction of oil and other minerals as well as metals. The campaign is designed to make both corporate reports and developing country budgets more transparent, exposing and diminishing instances of mismanagement and corruption.

While it is perplexing to think that wealth can become a curse, it is even more vexing to see so little done about it. All of the above policy remedies are both feasible and affordable, and none of them would pose a major policy challenge. Each remedy would benefit from further research and investigative reporting in order to discover more of the advantages and flaws as well as what could be learned from earlier experiments. The biggest political challenge is the widespread lack of understanding of the costs of doing nothing, and the lack of knowledge among policymakers about the merits of appropriate policy remedies.

