

CHAPTER 2

What Is the Role of the State?

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ABSTRACT

In their dealings with the global extractive industries, national governments frequently fail to get full value for their resources. The key problem is that private-sector parties have interests to maximize their revenues and to minimize those accruing to the country. Full privatizations of rights to oil and gas wealth have been marked by some of the worst abuses, with governments getting the worst deal. For countries with high-quality public management, and where there are not particularly difficult extraction problems, national oil companies should often play a central role in managing resources. Others face the difficult choice of trying either to improve public sector management or to rely on an imperfect and possibly corrupt public sector to define relationships with a private sector whose goal runs counter to that of the public interest—minimizing payments to the public. Even in these cases there are a number of important guidelines that governments can follow to ensure they get better value for their assets: Institutions should always be strengthened *before* engaging in privatization; patience should be practiced—it is sometimes better to keep oil wealth in the ground than to sell it badly; provisions should be identified for contract renegotiation *ex ante*; contracts should be minimally complex and evaluated on the basis of the incentives they generate and their performance under different scenarios; finally, the timing of payments should be a function of the ability of the state to bear risk. Whatever the approach, the aim of government decisions should be to ensure transparency, ownership, and fairness.

INTRODUCTION

In the first chapter of this volume, we identified one of the central problems underpinning the resource curse: Too often countries do not get the full value of their resources. Consider a government genuinely interested in using its good luck of an abundant resource endowment for the benefit of its people. But first it must somehow extract the resources from below the ground and sell them. To do that, it will have to rely on public employees and/or private contractors. It can hire the private contractors to undertake specific tasks, or it can sell them the natural resource in return either for a fixed amount or a royalty on whatever is sold. Many of the parties upon whom it must rely, however, have another objective: maximizing their own income or well-being, which in turn means minimizing the amount paid to the government. This is a natural and inevitable conflict of interest. Both in the public and private sectors, there are many who would also like to use the country's wealth for their own private purposes. Thus, a key challenge any government faces is to work out how to engage with these other actors, whose objectives inevitably differ radically from its own.

In this chapter, I focus on one issue that is particularly relevant to answering the question: How should governments work with the private sector to maximize the total (expected present discounted value of) revenue it receives from its natural endowment?

The traditional saying *caveat emptor*—let the buyer beware!—puts buyers on notice of the natural risks they face in buying goods in the marketplace. This chapter adds a new maxim: Let the owner beware! Be skeptical of those offering to manage your resources or to buy them from you. Their objective is not to increase your well-being, but theirs. And too often, the conditions that are required to be satisfied so that you can “trust the market” are not satisfied.¹ There is another maxim: “A fool and his money are soon parted.” This is an even stronger warning to the publics in resource-rich countries: *It is all too easy for politicians to connive with those in the private sector to take from you what is yours.* This maxim may be less catchy but no less important: When it comes to natural resources, even a reasonably informed citizenry and their money can soon be parted.

THE PROBLEM OF CHEATING

The prospects of cheating are very real and great, and can arise at every stage of the transaction. The government may get less for the lease than

it should—there may even be attempts to restrict competition in bidding. Whatever the contract that has been signed, corporations are tempted to cheat—to pay less than they are supposed to—because the amount of money that can sometimes be made by doing so is so large. The occasions to cheat arise not just in developing countries. In the 1980s I worked on a case involving cheating by the major oil companies in Alaska. This oil-rich state had a mineral lease requiring the oil companies to pay it 12.5 percent of the gross receipts, less the cost of transporting the oil out from the far-flung site at Prudhoe Bay on the Arctic Circle.² By overestimating their costs by just a few pennies per gallon (and multiplying those pennies by hundreds of millions of gallons) the oil companies would increase their profits enormously. They could not resist the temptation.

They also found other ways to cheat, such as selling their oil to their own subsidiaries, recording a lower than fair market value (see chapter 4); or using other subsidiaries to ship their oil out and then reporting a fictionally high shipping cost. Each piece of the cheating puzzle was hard to detect, and government prosecutors had to analyze thousands of transactions—at a cost of tens of millions of dollars. In the end, there was no doubt that cheating had occurred—and on a massive scale. There followed a series of settlements involving a who's who of global oil companies—including what are now BP, ExxonMobil, and ConocoPhillips—for an amount in excess of 6 billion dollars.³

Alabama successfully brought an even more outrageous case: *State of Alabama v. Exxon Mobil Corp.*⁴ At suit was whether or not Exxon could deduct production costs from royalty payments as well as deduct gas used to fuel the wells. The contract very clearly stated that they could not. Moreover, internal Exxon memos presented at trial suggested that they were aware of this and that they had conducted a cost-benefit analysis of the likelihood of getting caught. The court found for Alabama, awarding \$11.8 billion in punitive damages and \$63.6 million in unpaid royalties.⁵

While such possibilities exist in the United States, many more possibilities for cheating exist in countries where institutions are weaker.

In this chapter, I provide some guidelines for governments attempting to navigate in this difficult environment; I describe the various ways that countries can be, and have been, deprived of the true value of their resources; and I show what can be done to reduce the risk of being cheated.

If there is a single message of this chapter, it is this: There is no easy way out of this problem. Privatization—the process of turning over natural resource assets to the control of the private sector—is *not* the answer, or at least it is not necessarily the answer. But while there is no simple solution, some governments have done better than others in obtaining for their citizens a large fraction of the value of their resources. This chapter describes some of the things governments can do to increase that fraction, including strengthening institutional structures *before* engaging in privatization, holding corporations to higher standards, and carefully evaluating contract terms.

PRIVATIZATION AND PROBLEMS OF AGENCY

The central problem facing resource-rich countries may be easily stated: Various individuals wish to divert as much of that endowment as possible for their own private benefit. Modern economic theory has analyzed the generic problem of inducing agents (here government officials) to act in the interests of those they are supposed to serve (the principals, here citizens more generally). Agency problems arise whenever information is imperfect, and hence there is a need to emphasize *transparency*, or improving the openness and availability of information in the attempt to control corruption.⁶

Information is not the only way by which agency problems might be mitigated. Constraints can be imposed on actions that can be undertaken. Constraints on decision-making processes might affect the magnitude of the distortions that arise—for instance, requiring multiple approvals might increase the number of people who have to be bribed to get resources at below-market prices. The more people involved, the greater the probability that at least one is incorruptible (at least at going prices), thereby decreasing significantly the risks of corruption.⁷ With the cost-benefit calculus for corruption changed, there might be less corruption.⁸

Every interaction opens up scope for an agency problem (and corruption is only one form that agency problems take). There are agency problems within firms, within the government, and in the transfer of assets from government control to the private sector. The entire set of rules governing the extraction of natural resources affects the magnitude of the agency problem—and the benefits that accrue to society from that country's natural resources.⁹

THE GENERAL PROBLEM OF DIVERSION

A look at experiences around the world shows a rich catalogue of ways by which resources get diverted and in which, in accomplishing the diversion, economic efficiency is impaired. In many developing countries, government-run oil companies have been marked by high levels of corruption; even when there is no overt corruption, those running the oil companies often pay themselves and their workers above-market wages—resulting in less money left over for the rest of the country. In countries with high levels of unemployment, the government-run oil companies become bloated with employees, a sort of welfare program directed disproportionately at the well connected.

Much of the public discourse has focused on government corruption—the attempt by government officials to divert as much as possible for their own use. This has led many (including the international financial institutions) to encourage privatization—turning over, in one way or the other, the development of natural resources to the private sector. Two decades ago, at the beginning of the wave of privatization, it was hoped that privatization would solve these problems. The private enterprises would have an incentive to be efficient. Especially if the resources were put up for auction, the winner would be the firm best able to extract resources; economic efficiency would be assured, at the same time that government revenue was maximized. But what has happened in the last two decades has made it abundantly clear that privatization does not eliminate scope for corruption, or more generally, eliminate agency problems. There are agency problems within private firms, just as there are in government enterprises. This is especially the case in those countries without good corporate governance (which means almost all developing countries). Those controlling the corporation (the company's officers) typically have the opportunity to divert the company's resources to their own benefit—and they not infrequently take advantage of that opportunity. Indeed, because public scrutiny of corporations, even public corporations, is typically less than public scrutiny of government enterprises, the scope for diversion is all the greater.¹⁰

We are concerned here, however, with the impact of these agency problems on the revenue obtained by the government. Privatizations typically entail not only a one-time payment from the private sector to the government but also an ongoing stream of payments, in the form of taxes. Leasing tracts of land entails further streams of payments, in the form of royalties. In many cases, government is a (minority) shareholder in the corporation

given the right to extract the oil or natural resources. Each of these arrangements entails different potentials for “diversion” and different agency problems, and there is potential for diversion at each stage of the transaction, for example, both at the time the contract is signed and at the time it is implemented. When, for instance, private corporations in which the government is a minority shareholder are entrusted to develop a mine or oil field, there is a standard set of corporate governance problems: the abuse of minority shareholders by the controlling shareholder, or of shareholders by the “manager.” Often, for instance, the company hires a foreign firm to “manage” the oil well. The question then is: What is the appropriate compensation? Even if the manager is directly compensated appropriately, he may pay a related third party more than fair market value for services—diverting value away from the government.

Even when the only ongoing relationship involves taxes or royalties, there are problems, as the company may attempt to cheat, hoping that if the amounts per barrel are small enough, they will go undetected. But pennies a barrel times hundreds of millions of barrels adds up. In the beginning of this chapter, we described two episodes of such cheating in the United States.

ADAM SMITH, THE INVISIBLE HAND, AND DIVERSION

It should have come as no surprise that privatization failed to solve the problem of resource diversion: profit-maximizing private enterprises naturally seek to minimize what they give to the government for their rights to control the use of the asset.¹¹ Modern capitalism is, by and large, based on a simple calculus: Each individual is concerned with how much he can get for himself. Under highly restrictive (never satisfied) conditions, Adam Smith was right that the pursuit of self-interest leads, as if by an invisible hand, to economic efficiency; but more generally, it may not. Adam Smith and his followers assumed perfect information; or at least that there were no agency problems (see Arnott et al. 1994; Greenwald and Stiglitz 1986). In many cases, the pursuit of self-interest (greed, by any other name) by American CEOs, investment banks, and accounting firms has not led to efficient investment, though some individuals have themselves been amply rewarded. And, so far at least, few have wound up paying any criminal penalties (for an extended discussion, see Stiglitz 2003).

It is standard doctrine, at least among American economists and in much of the business community, that firms should maximize the stock

market value.¹² Almost every business school teaches that this is what managers are supposed to do. If they do not, they will be punished, either by being dismissed by their shareholders or by being taken over.¹³ These doctrines have strong implications: If a firm can get control of oil at one-tenth of the market price by paying a \$10 million bribe to a government official, a firm maximizing shareholder value should do so, so long as the expected penalties (the probability of being caught for violating the Foreign Corrupt Practices Act multiplied by the expected size of the fine if one is caught) are not too great.¹⁴ If a mining company can somehow get out of a country without having to pay the full costs of cleanup, it should do so; if it is necessary to bribe some government official, or to make a campaign contribution, then that is just a necessary business expense.¹⁵

While some Western firms would shy away from the crassness of the behavior just described, the market economy rewards it. If a country auctions off its natural resources, the firm willing to pay the highest price is not necessarily the firm that is most efficient in extracting the resources. Rather, it might be the one most efficient in having the government pick up the cleanup costs, for example, minimizing the bribes required.

And few Western firms would shy away from active involvement in politics, in making campaign contributions (“investments” from which they expect, and typically do get, returns).

PRIVATIZATION AND THE SCOPE FOR DIVERSION

Privatization actually increases the scope (opportunities and incentives) for corruption, by increasing the potential for connivance between government officials and others for diverting resources away from the public good. The returns to corruption are higher and there is now a much wider range of hard-to-detect mechanisms for diversion. Prior to privatization, government officials can divert only a fraction of the flow of revenues; with privatization, government officials today can divert a fraction of the total value of the resource—the present discounted value of the future flow of revenues. The greater payoff for corruption provides greater incentives for corruption—and the record shows that individuals do respond to incentives. As we shall explain below, privatization often affords enormous opportunities for apparently legal (though typically nontransparent) ways of driving down the price paid for the resource.

The problems detailed in the paragraphs that follow are, for the most part, jointly problems of the private and public sectors—the agency

problems in the two reinforce each other. The private sector exploits the public sector agency problem, the fact that the interests of the government official do not coincide completely with those he or she is supposed to serve. Even if the corporation, as a matter of official policy, does not seek to exploit the public sector, standard compensation schemes in the private sector provide incentives for their “agents” to do so.

EFFICIENCY

While the discussion in this chapter centers on the problem of maximizing the revenue accruing to the government, and focuses in particular on the problem of diversion, it should be clear that this is not a zero-sum game. It is not *just* a matter of diversion. In the process, resources often are not used well; resources may be extracted too quickly, without due attention to environmental consequences. Taking the wealth generated out of the country to protect it from recapture may have large macroeconomic consequences.

By most accounts, Norway’s state oil company was both efficient and incorruptible; probably few countries have been able to realize for its citizens a larger fraction of the potential value of a country’s resources. In the case of Norway, institutional change may make little difference in either direction; elsewhere, however, such opportunities for resource diversion may be quickly seized upon.

Norway’s story is important (see chapter 4) because it destroys the shibboleth that efficiency and welfare maximization can be obtained only through privatization. Nor is Norway alone. Malaysia also makes claim to being the global champion and argues that its state-run oil company is able to garner for Malaysia a larger fraction of the value of that country’s oil resources than it could have otherwise achieved.¹⁶ The very process of privatization introduces a major opportunity for resource diversion, and those arguing for privatization must show that the losses from maintaining the resources within the public sector are greater than the combined losses associated with the transfer and the losses from agency problems after privatization.¹⁷

MECHANISMS FOR DIVERSION IN PRIVATIZATION

There are basically four (sometimes interrelated) mechanisms for “corrupt” privatizations, besides the obvious ones—just giving the resource to one’s cronies, or, as in the United States, having a first-come system in which

those already in the field are in a better position to grab the resources. First, reduce competition; second (particularly relevant in economies in transition when capital markets were not well developed), channel funds to favorites; third, provide favorites with inside information about the value of what is being sold; and fourth, enforce terms asymmetrically.

LIMITING COMPETITION

When competition for the resources is limited—and especially when it is known that it is limited—then the prices that prevail will be lower. There are three ways of limiting competition. The first is suddenly to put up for lease a large number of tracts—increase the supply so that the bidding on each tract is limited. This is what President Reagan did in the early 1980s. It was like a fire sale—as if the government *had* to get rid of its holdings *immediately*. But in fact, there was no reason for it; it was not as if the oil was going to disappear, or as if the United States needed to raise cash quickly. On a very large fraction of tracts, there was only one bidder (and, of course, the oil companies knew this). In a study I conducted with Jeff Leitzinger (1984) we quantified the impact on the price the government received. The government got a fraction of what it would have earned had the tracts been put up in a more orderly process, and the extra profits went into the coffers of the oil companies.¹⁸

There are several things the government can do to *increase* competition and to mitigate the magnitude of the asymmetries of information and their consequences. One approach is to require all companies to disclose their geological information concerning the tract and provide all bidders with information from that pre-bidding exploration that is publicly funded, which should be undertaken more extensively.¹⁹ Checkerboard leasing (such as undertaken by Alberta, Canada) may allow more relevant information to become available before bidding, again resulting in government receiving more for its tracts.

Another way is to design the auction in ways that reduce the consequences of information asymmetries and thus increase the magnitude of competition. For instance, royalty bidding (in which bidding is over the percentage of the value of production to be given to the government) may produce significantly greater competition than bonus bidding. First, under royalty bidding, information asymmetries about the quantity of oil matter less (more important are information asymmetries about the magnitude of the costs of extraction). Second, bonus bidding favors large companies

that can afford to make large up-front payments. Up-front bonuses constitute, in effect, a loan from the oil company to the government—the government gets money up front, which the oil company recovers later through sales of oil. While the current government benefits from money that otherwise would accrue to successor governments, the interest rate implicit in the loan is typically higher, sometimes much higher, than that at which the government can borrow abroad.²⁰ Third, bonus bidding favors larger, more diversified firms that are better able to bear risk, since, under bonus bidding, the risk (concerning the price of oil, the amount of oil, and the costs of extraction) is imposed on the bidder.²¹

Royalty bidding has one major disadvantage: a larger royalty rate reduces the incentive for companies to invest *ex post*, and may result in premature shutdown of wells as extraction costs rise; in contrast, the signature bonus is a sunk cost and does not distort subsequent investments.²² The problem of premature shutdown has especially become a source of concern; but contractual arrangements, entailing reducing royalty rates at later stages of production, have been devised that have mitigated, if not eliminated, the problem.²³ Of course, if there were little uncertainty over the value of the resource, and capital markets were perfect (so there would be no discrepancy between the government and corporate borrowing rates), then this advantage of bonus bidding would predominate over the disadvantages noted earlier (see chapter 5). But realistically, there appears to be a strong presumption in favor of royalty bidding.²⁴

The processes for limiting competition through the design and scale of the auction and the disclosure of information, which we have described in the case of the United States and other developed countries, are far more subtle than those often employed in developing and transition economies. When corrupt officials wish to limit competition, they may simply design qualifying conditions that allow only preferred bidders to compete.²⁵

Not surprisingly, large multinationals have opposed reforms that would increase competition and lead to higher overall payment, and they have by and large prevailed.²⁶ The bonus bidding system still prevails, and there is limited pre-bidding disclosure of information.²⁷

CHANNELING FUNDS

In the economies in transition in the former Soviet Union, another approach was often used in corrupt privatizations. The government did not allow foreign bidders, and at the early stages of transition, few domestic

bidders had large resources of their own. The ostensible solution for firms then was to borrow from a bank. But in some countries, the government still controlled the banks—and so it could determine who got the money to bid and how much money they got. One pocket of the government was giving money to another pocket through an intermediary. There was no net transfer of cash to the government; the situation was only slightly different from what would have happened if the government had bought the mine or oil field from itself. That slight difference had enormous consequences, however. By going through the private intermediary, the government's equity position was converted into a creditor position. If the government had received fair market value, it would simply have entailed a transfer of risk. Yet, the government did not receive fair market value. Moreover, because it was easy for the buyer to default, there was not even any transfer of risk. It was simply a transfer of the upside potential to the private party.

I illustrated the point in the context of countries in which there are state banks, but matters differ little if the government controls the licensing of private banks. The granting of a license, with lax regulation, is granting the right to print money—or in this case, to determine who is able to bid for the government's resources. (Even with some regulation, government can affect who wins in that it can determine at whose bank deposits are put, and therefore who has the potential for making loans.)²⁸

There is a clear implication. If privatization is to occur in countries in which there are limited numbers of private parties capable of bidding for the resources in a bonus bid, then: (1) bidding should be converted to royalty bidding—augmenting the argument for royalty bidding given in the previous section—and/or (2) foreign bidders must be allowed. Alternatively, the privatization should be postponed until there are enough viable bidders within the country to give rise to a competitive auction.

ASYMMETRIC INFORMATION

We have already noted the adverse consequences of asymmetries in information. It is not just that those who have inside information know what to bid. The effect is more subtle: When some have an informational advantage, the others, knowing that they are informationally disadvantaged, bid less than they otherwise would. They suffer from a version of the “winner's curse”—the fear that they will win only if they bid too much, in particular, only if they bid more than the “informed” bidder (see chapter 5).²⁹ As a result, companies shave their bids down; the insider, knowing

this, can, on average, obtain the asset at a lower price—meaning the government receives less.

Such problems of asymmetric information are likely to arise in many oil-producing developing countries. They are obviously particularly likely to arise if those involved in management of the enterprise when it was run by the state are involved in one of the bidding consortiums.

Such problems are easily illustrated by a case that arose in the United States in the privatization of the U.S. Enrichment Corporation (USEC), the government enterprise responsible for making enriched uranium, required by atomic power plants and in manufacture of atomic and hydrogen bombs.³⁰ In this case, the government official who headed USEC led the consortium that won the bid. Clearly it had an information advantage.³¹ Making matters worse, at the last minute, the U.S. government changed the terms of the bidding, putting into the deal more of its stock of uranium. The net effect was that, when the value of cash and uranium was netted out of the deal, as well as the commissions taken by the Wall Street firm that managed the privatization, the government got little for its business—almost surely a fraction of the present discounted value of what it would have received had it remained in the government's hands.

ASYMMETRIC ENFORCEMENT

Asymmetric enforcement of contract terms presents further problems. Most leases, for instance, have requirements that the lessee develop the field within a certain period of time. The value of the lease depends on how strictly such a requirement is enforced. If, for instance, there is price variability, then bidding on a lease with a high extraction cost (without such a provision) can be viewed as an option. If the price turns out to be high, the firm develops the lease; otherwise it does not. Even if the firm intends eventually to develop the field, if extraction costs are high, it pays for it to wait. If most bidders are bidding assuming that the contract will be enforced, an insider who knows that it will not be can easily win the bid—paying far less than the true value (given the lax enforcement).³²

EXPERIENCES WITH PRIVATE CONTROL AND ECONOMIC EFFICIENCY

Many of the advocates of privatization in the 1980s and 1990s were not much worried about corruption. They were often not even worried about

the government getting fair value for the resources. They were focused on efficiency.³³ They believed that once resources were turned over to the private sector, they would be efficiently utilized. Corrupt privatizations affected the distribution of income, but the advocates were little concerned with that.

But they were wrong in their conclusion that corrupt privatizations would lead to economic efficiency because they did not understand property rights as a social construct. Property rights can be secure only if they are viewed as legitimate. Illegitimately obtained property cannot be secure, and, from a societal perspective, corrupt privatizations generate illegitimately held property.

Those who steal property know that their rights to the property they control are not secure; and so too for those who knowingly buy stolen property. There is an important lesson in this: A successful market economy requires secure property rights; but, in a democracy, property rights can only be secure if they are viewed as legitimate. Property acquired through fraud or coercion has no real legitimacy. Discussions of the sanctity of property rights have to be accompanied by policies and actions that give widespread legitimacy to property holdings. Without that, the turmoil so prevalent in resource-rich countries will continue.³⁴

Those who obtained the property in the illegitimate privatizations understood this. Their incentive then was to exploit for themselves as much of the property as they could and to move it to a safe locale—outside of the country. Doctrines of free capital market mobility thus aided and abetted the diversion of the resources. With money fleeing the country, no wonder that many of the resource-rich countries did not obtain the benefits that one would have expected.³⁵

In the end, then, privatization did not always achieve even the modest objective of economic efficiency for four reasons:

1. Without long-run secure property rights (and, as I have argued, there *could not* be long-run secure property rights) there is an incentive to extract as much as one can as fast as one can—faster extraction than is efficient. (In the case of renewable resources, this may even entail pushing extraction beyond the level of sustainability.)

2. Without long-run secure property rights, incentives to make the complementary investments required for efficient extraction are attenuated.

3. Without long-run secure property rights, there will be reluctance on the part of lenders to provide capital to finance these complementary

investments—even if the putative owners had been willing to make those investments.

4. It pays for each market participant to take his money out of the country, even though social efficiency would have required leaving it in.³⁶

PRIVATIZATION AND INSTITUTIONAL STRUCTURES

There were further problems with the timing and manner of privatization. The International Monetary Fund (IMF), in Russia and elsewhere, had urged as rapid a privatization as possible. They worried that so long as resources remained under the control of government, the resources would not be efficiently utilized, and that there was scope for corruption. Yet, corruption was only one of the reasons these governments got so little for their resources. Bidders knew that the governments were under pressure to privatize quickly, so they bid more conservatively, knowing that the government's reservation price (the minimum price that it would accept) was low.

But there were further consequences of the pressure to privatize quickly: Fast privatization meant (in many countries) that privatization occurred before the institutional infrastructure—a developed legal system, a tax administration that could collect the revenues due, a corporate governance structure that could mitigate agency problems *within* firms, or financial institutions that could provide money to finance needed investments to realize the full value of the resources—was in place.³⁷ This, in turn, had several implications.

1. It meant that laws ensuring good corporate governance were not in place, so wealth was shifted from the corporation to those who controlled the corporation.

2. Many of the advocates of rapid privatization said that a rule of law would develop as those with control of resources would demand it. There was, however, no historical or theoretical basis for the claim. Quite the contrary: As Karla Hoff and I (2005) have shown, those who controlled the assets preferred to maintain a system that gave them more leeway to strip assets.

3. In the absence of the financial infrastructure, firms could not get access to the capital they required to improve the efficiency of resource extraction. Again, the balance was shifted toward stripping assets rather than building wealth, and all the other problems noted so far were thereby reinforced.

4. Privatizations occurred before the development of effective tax institutions, so one had the anomalous situation of the government turning over massive amounts of the country's most valuable resources to private entrepreneurs and yet having insufficient funds to finance basic social safety net and education programs.

Given all of these problems, it was perhaps no surprise that privatization failed to yield the benefits promised—a few people became very rich, but the country as a whole saw little benefit.

THE LESSONS OF RUSSIA

Russia provides a dramatic case in which the government has received but a pittance for the country's most important asset—its inheritance of natural resources. With the end of communism and the decay of an effective state, Russia, once a world superpower, became increasingly natural resource dependent—with, by some estimates, some 70 percent of its gross domestic product (GDP) related directly to natural resources.³⁸

In 1996, Yeltsin needed help getting reelected and a small group of “oligarchs” had the organizational and financial capacity to help him—in exchange for control of the nation's vast natural resources.³⁹ Yeltsin allowed them to take control of these resource assets *legally*, at prices that were but a fraction of the fair market value, and *using the very rules of the game that they had helped to make*. The critical events occurred in 1995–1996, in a sale that Crystal Freeland called the “Sale of the Century” (Freeland 2000). There were auctions. But the auctions were rigged. As a result, the oligarchs got that country's vast natural resources for a pittance—some senior government officials believe the amount “stolen” exceeds a trillion dollars.⁴⁰ If Russia was not under such pressure to privatize, it could have rejected the bids. In the rush to privatization, those controlling the bidding process “disqualified” many of the bidders, ensuring that the competition was limited. No safeguards were set up to ensure that the country was receiving full value for its money: The IMF put conditions on speed, not on how well the privatizations were conducted.⁴¹

The privatization in Russia set in motion a vicious circle. Even without corruption, as we have noted, rapid privatization means that governments receive less than fair market value for the companies they sell off. With corruption, the prices were still lower. Either way, the legitimacy of the transfer of public resources to the private sector was questioned. And

investors, those who had acquired the assets in the “illegitimate” privatizations, felt, quite rightly, that their property rights were not secure—a new government under popular pressure might reverse the privatization, or demand more money. Without a sense of security, new owners limited their investments and then took as much of their profits out of the country as they could—leading to further disillusionment with the privatization process, making property rights still less secure. Though Russia had been told repeatedly by its Western advisers from the IMF, the U.S. Treasury and elsewhere, that privatization would lead to growth and investment, the outcome was disappointing: Output fell by 40 percent. And there were massive capital outflows; one of the oligarchs, Roman Abramovich, famously purchased the Chelsea football team and numerous country estates in the United Kingdom (see, e.g., Garrahan and Ostrovsky 2005). Ordinary Russians, naturally, found it hard to see how this helped Russia’s growth.

Russia has struggled to find a compromise so that the oligarchs who obtained the nation’s assets on the cheap might pay a certain amount, perhaps over time, in return gaining legitimacy for their ownership and security for their property rights. Though such a compromise could be of benefit not only to the oligarchs but also to the country—helping to stimulate investment—it has so far eluded Russia.

While Russia’s privatization has highlighted the problem, conflicts over the fairness of natural resource privatizations and contracts are endemic around the world. In the case of Russia, it was Russians stealing money from their own country; in most other cases, those extracting the resources are foreigners, which only heightens the tensions. Governments have been toppled because of this problem—as in Bolivia—and the sense of outrage has given support to populists, like Chavez in Venezuela. The ordinary citizens see rich Venezuelans and foreign companies benefiting from their wealth, but none of the wealth seems to trickle down to them. Chavez’s ability to renegotiate old contracts, to get better terms for his country, simply reinforced the belief that, in the past, they had been cheated.

RESPONDING TO THESE RISKS

Agency problems are endemic. They cannot simply be wished away. And there are no magic solutions. The hope that privatization would solve agency problems (including problems of corruption) was a dream only of those who did not understand the underlying economics.

But while agency problems cannot be eliminated, I have argued some contractual and institutional arrangements make them worse than others. As I noted, the reason that net profit contracts are not used—even though they might *seem* efficient—is that they exacerbate agency problems.

In the paragraphs that follow, I describe some of the steps (beyond those already discussed) that governments can take to mitigate these risks.

STRENGTHEN INSTITUTIONS BEFORE ENGAGING IN PRIVATIZATION

I explained earlier that it is no accident that privatization has been beset with so many problems. Privatization has often occurred before good institutions that can conduct, for instance, fair, competitive, and efficient auctions, are in place. And privatizations have also occurred before institutions that can collect taxes and enforce contracts are in place. This suggests that these governmental institutions need to be strengthened before engaging in privatization. Yes, there may be some losses of public revenues in the interim, but these losses (essentially of a short-run cash flow) pale in comparison to the losses that have occurred in the privatization process (which are related to the value of the *stock*, not just the cash flow).

But this raises a problem: If the government has developed these strong institutions, perhaps it is better for it to go one step further, and develop the institutions for oil extraction itself, i.e., develop efficient and honest state-owned enterprises for oil extraction, as Norway and Malaysia did (and as Chile did in the case of copper.) There is one marked advantage of this strategy: It avoids the agency problem of privatization itself, in the process of which the government may lose a substantial fraction of the value of the asset.

BE PATIENT: OIL DOESN'T DISAPPEAR

In the case of fields that have not been developed, there is a strong argument for waiting: the assets will not disappear. Indeed, if the price of oil rises over time, the value of the assets beneath the ground grows over time. Especially in cases where costs of extraction are currently high, and might be lowered over time with the progress of technology, the return to waiting may be higher than on any other investment the government might make.

Hotelling's analysis (1931) offers a framework for determining the optimum time to take resources out of the ground (see also chapter 6). In principle, the portfolio composition problem (whether to hold one's wealth as oil beneath the ground or as some asset above the ground) can be fully separated from the expenditure decision. But in practice, the two get linked. As mentioned in the Introduction to this volume, as the country sees its income rise (as a result of extraction) there will be pressure to spend the money. International advisers will emphasize that the country is not wealthier; it has just changed the composition of its asset base—but this argument may have only limited resonance with the electorate. This suggests delaying extraction of resources below the ground until the country can reinvest the resources well above the ground.

A further problem arises when it is known that the government—when it gets hold of the money from the extraction of the resources—will use it for its own purposes and not more broadly for the people. For instance, the government might buy arms to perpetuate its power. The people might benefit to *some* extent, but clearly not as much as they could or should. The prospects of the money being used better later may be greater than the prospects today, even after some time discount factor is taken into account. Again, patience is what is required. Institutional arrangements can be designed to help ensure the proceeds *do* help the people, but they are hard to enforce *ex post* and it is difficult to know what to do in the presence of a variety of forms of renegeing on the terms.⁴²

IDENTIFY PROVISIONS FOR RENEGOTIATION EX ANTE

We should recognize that when large deposits of oil or minerals are found, or when the price of the oil or mineral rises markedly in an unexpected way, there are likely to be incentives to renegotiate contracts, especially if the original contract is not subtle enough in identifying the different circumstances in which such renegotiation might be desirable. Inevitably, with fixed costs already invested, these renegotiations can put governments in a bind. If the private company doesn't accede to the demands, it loses the contract. By the same token, oil companies may claim that the quality of oil is worse than they anticipated, or costs are greater than they anticipated, and demand better terms, threatening to leave. Again, the country government is in a bind. If the company leaves, there will be a costly delay in bringing the oil on line, and any new company brought in

may demand terms not much different from those being demanded by the oil company. Often governments simply accede to the demands.

Every contract is subject to dispute, and this is no less true of oil contracts. In some cases, the company may have made investment commitments as part of terms of the lease (or sale). But when the commitments are made in terms of dollars invested, there might be non-arm's length accounting, with the company overvaluing the investments. On the other hand, there are a myriad of ways short of losing the contract in which the government can harass the contractor, many of which might not have been precluded by the contract. Since the discovery of a large find is likely to change the economic circumstances of the parties, producing both political and economic interest in a renegotiation, the parameters under which a renegotiation can occur should be identified *ex ante* so that agreements can be reached with less hostility than otherwise.

In the end, too often the country loses twice—first from the unfair contract or privatization, and second from political turmoil and adverse international attention from the investment community when an attempt is made to set things right.

AVOID COMPLEX CONTRACTS

A risk associated with complex contracts is that the true market value of the contract may be better understood by the oil companies than by the government (see chapter 4). For instance, if oil prices are highly volatile, and there is no due diligence clause for development, getting an oil lease is simply getting an option on the price of oil, and the price of the lease should reflect that option. A contract with a compulsory development clause would presumably lower the value of the lease—the contractor is forced to develop the lease at some time other than he would have chosen—but one needs to compare the extra development benefits with the loss of revenues. Contracts can be written that are sufficiently complicated so that it may be hard to tell whether there was a material breach; or provisions can be included that lead to breaches by both sides, making a determination of the fair resolution even more difficult.

There is a tension between the concerns just raised and those raised in the preceding section. Simple contracts, with few contingency clauses, are more likely to encounter circumstances in which there will be pressure to renegotiate.

Of use would be the development of a set of standard contracts, not written by the oil companies but by the oil producers, reflecting their experiences and attempting, in the best way they can, to guard against the various ways in which they have been cheated.

EVALUATE CONTRACTS ON THE BASIS OF THE
INCENTIVES THEY GENERATE AND THEIR
PERFORMANCE UNDER DIFFERENT SCENARIOS

Over the years, there have been a series of fads in extracting oil and other natural resources. There have been, for instance, various forms of contracting for the services provided. The general theory of contracting provides a lens through which these arrangements can be assessed—whatever the names attached to the arrangement—and calls attention to the fact that, so long as information is imperfect and contracts incomplete (i.e., always) issues of agency arise. Once the contract is specified, we can analyze payments in each of a different set of contingencies, and identify incentives and actions to which they lead. In short, we can, in principle, ascertain the fraction of the potential value of the resource that accrues to the government for a range of different price, quantity, or quality scenarios (see chapter 3).

MAKE THE TIMING OF PAYMENTS A FUNCTION OF THE
ABILITY OF THE STATE TO BEAR RISK

Different contractual terms provide money to the government at different times—and with different risk. As we noted, most bonus bidding puts money up front and imposes risk on the oil companies. For oil companies dealing with the United States, this is foolish and expensive: The United States can borrow far more cheaply than even the best of the oil companies, and it can diversify its risks far better. The implicit risk and time discount factors disadvantage government. This pattern may be reversed when it comes to a large oil company dealing with a small oil-producing country.

ENSURE AGAINST OIL RISK

Long-term oil markets, extending decades into the future, effectively do not exist. As a result, countries may wish to maintain their *real reserves* as

a form of asset protection—long-term risk management. This argument seems to have carried some weight in Bangladesh’s decisions concerning the speed with which to develop a field.

CONCLUSION

Modern welfare economics has provided us with tools with which we can assess alternative strategies for developing a country’s natural resources—the impact on “social welfare” (chapter 6). This is an approach which integrates the impact of natural resource extraction on the environment, on different groups within the country, as well as on subsequent generations. It incorporates macro- and microeconomics. It entails trade-offs, for example trade-offs between the magnitude of the agency problems, the risks of resource diversion, and exposure to risk. But for many applications, its comprehensiveness is matched by its cumbersomeness.

There are two simplified alternatives. One is to focus on how much the public has benefited from the sale, measured, for instance, by the present discounted value of revenues to the government.⁴³ The second is to measure the present discounted value of the change in the country’s GDP—*green* GDP, of course, not GDP as conventionally measured (for more on the importance of correct measures of GDP, see chapter 6).⁴⁴ Both of these are, of course, inadequate: The first because it puts no weight either on what happens outside the public sector or on what the government itself does with the money; and the second because it puts no weight on concerns about distribution (median incomes might go down even as total income goes up). But each is useful in highlighting the various abuses that can occur.

This chapter should have made clear that inevitably, in the contractual arrangements between a country and those who have the knowledge and skill to take the oil out, there arise a large number of agency problems. In addition, the form of the contractual arrangements may make some of the problems worse, while it mitigates others.

At this juncture, the research community has not provided a full compendium of provisions—with costs and benefits, successes and failures—in alternative situations. We noted, however, that among the most successful approaches are those of Norway and Malaysia, countries that decided to own and run their own oil companies, learning the requisite skills in the diverse areas of management and control from a range of oil companies.⁴⁵

Full privatizations—bonus bid, long-term leases to private companies with no government stake—have been marked by some of the worst abuses, with governments getting the worst deal (e.g., payments as a value of the oil).

For countries with high-quality public management, and where there are not particularly difficult extraction problems (such as those associated with deep water extraction), the route taken by Malaysia seems desirable. For others, the answer is less clear. They face the difficult choice of trying either to improve public sector management or to rely on an imperfect and possibly corrupt public sector to define relationships with a private sector whose goal runs counter to that of the public interest—minimizing payments to the public. Where possible, the path set forth by Malaysia is desirable—while initially relying on the private sector, a key objective should be the transfer of technology, skills, and understanding of organizational structures to enable the creation of an honest and efficient public sector extractive industry.

Whatever the approach, the following principles should guide the government:

Transparency: Open and transparent agreements, openly arrived at. Any oil firm not willing to disclose all terms of the contract, volumes extracted and prices sold, should be barred from operating within the country. Business secrecy is too often simply a cover for bad behavior. By the same token, when there are adjustments to the terms of the contract, they should be made in an open and transparent manner.

Ownership: The developing country should remain the ultimate owner of the natural resource. This means that residual rents and residual control rights should reside with the country. Of course, it may be in the interests of both parties to specify as clearly and extensively as possible what happens in various contingencies, but no contract can be fully complete.

Fairness: Natural resource rents belong to the country; foreign oil companies should get only a fair rate of return, adjusted for the risks they face. This means that the contracts should provide that increases in the price of oil or gas should go disproportionately to the developing country.

Earlier I described the principles that should guide the auction process, for instance, a strong presumption for royalty bidding, with the results of pre-bidding exploration publicly disclosed. When there is only one (or a few) bidder(s) on a tract, there should be real concern that the country

will not receive fair value for its resources. In some cases, it may be desirable to have bidding for particular services, rather than leasing the tract. The reforms described in this chapter will not be welcome by all: There are many who benefit from current arrangements. They will raise worries that development will be impeded or growth slowed. These are issues of political economy, discussed, for example, in chapters 8, 9, and 10. Suffice it to say here, reforms in political processes—including those relating to campaign contributions—might in the end be necessary to achieve some of the simple institutional reforms advocated here. But the argument that a strategy of privatizing the assets somehow avoids the need for such political reforms is inconsistent both with theory and experience.

For many of the developing countries, the central problem is not so much the lack of adequate foreign assistance but the failure of the international community to pay adequately and fully for the resources that they have taken from the country, and to provide money in ways which go toward the development and well-being of the people in the country. Much of the responsibility for ensuring that countries are fully paid and that resources are well used lies, of course, with developing country governments. But I have shown, in this chapter, that there are incentives on the part of multinationals that go in quite the opposite direction, and that, in the past, their actions have sometimes undermined democracies and contributed to pervasive corruption, one of the defining characteristics of those countries with the resource curse.

It is possible that countries with more resources could actually face better prospects for growth. But if this is to happen, at the very least, developing countries must get full value for their resources, and the money that is received for the resources must be directed at benefiting the country as a whole rather than particular groups only. The resource curse is not inevitable, and there is much that can be done—by developing country governments, multinational companies, and the international community—to ensure that all the people in those countries lucky enough to have an abundance of resources will in fact enjoy the fruits of that bounty.

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NOTES

1. The general set of conditions under which it is efficient for government to turn over a complex activity (like national defense or oil extraction) to the private sector is highly restrictive. See Sappington and Stiglitz (1988).

2. In addition, the oil companies were required to pay 10 to 15 percent of the value of oil produced in Alaska to the state as severance taxes.

3. See Fineberg (2003). In what came to be known as the “Amerada Hess case” for the first company on the list of 15 defendants, BP alone settled for \$185 million in royalties (in 1991) and \$1.4 billion in back taxes (in 1994), though the federal government provided substantial tax relief to BP that cut its settlement cost in half. For more on the BP case, see Corzine (1994). I served as an expert witness in the suit. For more background on the Amerada Hess case and its resolution, see Thomas (1995). Alaska was only the first of a long line of suits by states and the federal government alleging that the oil companies had cheated on hundreds of millions of dollars of payments. The government has already prevailed on a number of these cases. During the Clinton Administration, new regulations were issued to try to limit the scope for such cheating.

4. The decision in the case, *State of Alabama v. Exxon Mobil Corp.* (no. cv-99-2368), can be found at http://www.verdictsearch.com/news/docs/national-nwltr_120303/1.jsp.

5. An original ruling, requiring Exxon to pay \$3.4 billion in punitive damages and \$88 million in compensatory damages, was thrown out after the Alabama state high court determined jurors should not have been allowed to see a letter by an Exxon-Mobil lawyer discussing legal interpretations of the royalty agreement (see Davis 2003).

6. The problem of agency in the context of corporations was discussed in Stiglitz (1985) and Jensen and Meckling (1976). For a brief discussion of some of the subsequent literature, see Stiglitz (2000). The role of the failings in corporate governance in the lack of success in Russia’s privatization is discussed in Hoff and Stiglitz (2005).

7. A particularly useful device is constantly to rotate government officials, making it virtually impossible to bribe every official who might be involved in the transaction.

8. Another way of controlling agency costs is to limit the scope for conflicts of interest. When officials from the oil industry help formulate a nation’s energy policy there is an obvious conflict of interest: an energy policy that is good for the energy industry is not, in general, an energy policy which is good for the nation. Regulations on “revolving doors” are intended to circumscribe the extent of these conflicts of interest.

9. This is true whether done by a government company or a private company; if by a private company, whether it is given control over the assets or just given respon-

sibility for extraction with, say, a five-year contract. If the assets are turned over to a private firm, how the “sale” is conducted also matters.

10. On the other hand, the “owners” may have a stronger incentive not to allow the diversion. But if ownership is diverse, there is a public good problem in oversight (see Stiglitz 1985). The difference between incentives for oversight in the public and private sector may differ relatively little.

11. The objectives of the optimal contract are several. They include (a) paying the agent as little as possible for extracting the oil and (b) ensuring that the agent extracts the oil in the most efficient way so that the total present discounted value of the oil that is extracted is maximized and at as little cost as possible. Governments with tight budget constraints and limited ability to access capital markets may also worry about risk and time profiles of payments. If appropriate budgetary frameworks are not in place, even advanced industrial countries may worry about these variables.

12. I call these “doctrines” because, except under highly restrictive conditions, stockholder value maximization does *not* lead to (constrained) Pareto efficiency, and may not even be in the interests of shareholders (see, e.g., Stiglitz 1972; Grossman and Stiglitz 1976, 1977; Stiglitz 1982).

13. There are important limitations in the takeover mechanism (see, e.g., Stiglitz 1972; or Grossman and Hart 1980). Takeovers are subject to the free-rider problems. Moreover, there are many ways by which managers reduce the likelihood of takeovers, some of which are, in effect, value destructing (Edlin and Stiglitz 1995).

14. When there are criminal penalties, some monetization of the cost of those penalties needs to be included in the analysis.

15. The media have uncovered numerous instances of such bribery, with relatively few convictions. Among those receiving considerable attention in recent years is that of ExxonMobil in Kazakhstan (see, e.g., Catan and Chaffin 2003) and Freeport Mining in Indonesia (see Waldman 1998). In the latter case, the company openly admitted paying government (defense department) officials for services rendered (providing security protection for the mine), saying there was no alternative to relying on Indonesian military for security. Indonesian government officials also asserted that payments by companies to soldiers or police officers violated their laws (Perlez and Bonner 2005).

16. Malaysia has since corporatized its oil industry (with the government still remaining a majority shareholder). The change may have released Malaysia from some of the constraints imposed on a government enterprise. While the freedom may result in greater efficiency, it also may simply provide more opportunities for diverting resources to private use (including through paying corporate officials high salaries).

17. Agency problems are not the only reasons that privatizations sometimes fail—or at least fail to perform as expected. There are also problems of commitment. On the one hand, once the investments have been made, governments may attempt to renegotiate for better terms, threatening to take over the assets. To protect themselves, investors may extract resources more rapidly than is optimal. On the other hand, at some point, the oil or mining company may threaten to shut down operations unless better terms are negotiated. The problem for the government is that it may not know whether such threats are credible because it does not know the true operating costs of

the firm. For instance, if the costs really are too high, then it pays for the government to renegotiate to improve the incentives of the company. If it does not pay, however, the government could find some other firm to operate the well under the original terms. This last option, however, might not be feasible if *other* oil companies also do not know the extraction costs. Then, assuming there are fixed costs to entering into the contract, they might infer that costs are prohibitive from the very fact that the other company left. Making matters worse, in simple bargaining problems with imperfect information, it may even pay the oil company to shut down operations (effectively go on strike) to improve the terms of its contract, even when production would be profitable for the company. Such asymmetries of information mean that, even when *ex ante* markets were highly competitive, *ex post*, the existing operator has some market power. It is often hard to design renegotiation-proof contracts. Requiring companies to post large bonds may make it less likely for firms to engage in such behavior. But there may be a large cost to such a requirement because of what is sometimes called the double moral hazard problem; the oil or mining company may worry that, even if it behaves impeccably, some future government may impose conditions that make operations so unattractive that it will want to withdraw, thereby “unfairly” forfeiting the bond.

18. I served as an expert witness in a suit by the State of Texas to try to stop Reagan’s fire sale. Even though we showed that the losses to the government—and the gains to the oil companies—were enormous, the court ruled that this was within the discretionary powers of the Administration (see Leitzinger and Stiglitz 1984).

19. Clearly, oil companies will resist this initiative, saying that if they are forced to disclose the information, they will reduce their bid. In equilibrium, one would expect, however, the increase in the amounts bid in the follow-on auction to more than offset the losses in the amount bid in the original auction. There may, however, be problems in enforcement.

20. This is especially the case for advanced industrial countries, like the United States; the corporate borrowing rate, which would typically be used in preparing bids, is considerably higher than the T bill rate at which the U.S. government can borrow, or the rate at which, say, the state of Alaska can borrow.

21. Note that beyond the effects on competition, by imposing the risk on the company, bonus bidding also lowers prices as private sector participants demand compensation for bearing this risk (a risk premium is taken out of the price).

22. There is a second disadvantage: With no bonus payment, a firm may bid aggressively on the royalty, viewing the contract as an option. If it discovers that the cost of extraction is low, it develops the field; otherwise, it abandons it. It has little to lose. In one sense, the government too has little to lose: The oil is not a wasting asset; it will still be there. With a performance commitment, the tract may be put up for rebidding. If the government is concerned with getting cash flow quickly, it can mitigate this problem by increasing the (fixed) up-front bonus that has to be paid, discouraging firms from simply viewing the bid as a low cost option.

23. That is, a contract can provide that when the production from the field falls below a critical level, the royalty rate is reduced. The problem arises even in the standard bonus bidding contracts, which typically include a fixed (limited) royalty rate.

24. There is another nondistorting contract—royalty on net profit. The problem is that it is difficult to observe “true” net profits, and with net profit contracts, the agency problems noted earlier become overwhelming.

25. There is a certain subtlety even here. Even in well functioning auctions, there may be a process of qualification to ensure that bidders can actually pay what they bid. This process of qualification can easily be abused, however.

26. As a result of the fire sales during the Reagan Administration, there were only one or two bidders on many of the tracts. Indeed, the General Accounting Office released a study in 1986 reporting that the fire sales had “significantly decreased competition and government bid revenues” for oil leases, estimating that the government had foregone \$7 billion in revenue it would have received had the auction been better designed. The oil industry responded by claiming that the fast and expansive sell-off of leases would accelerate the pace of oil production, so that “gains from early receipts of bonuses, rents, royalties and taxes will be more than sufficient to offset” the lost bid revenues (Shabecoff 1985).

27. In the case of minerals, the problems are more extreme, as evidenced by the Clinton Administration’s failed attempt to revise the leasing laws.

28. See Freeland (2000) for a discussion of the privatizations of resources in Russia, which entailed many of the problems discussed in this and the previous section. Many of the privatizations in Czech Republic were intermediated through loans from state-owned banks—banks were not privatized in the early stages of the transition.

29. The winners curse phenomenon was first noted by Capen, Clapp, and Campbell (1971) and the mathematics was analyzed by Wilson (1977).

30. There were strong national security arguments for privatization (see chapter 6 of Stiglitz 2002). I am concerned here, however, with the narrower issue of obtaining fair market value.

31. The other major bidder was the contractor that had run the facilities for USEC.

32. Even worse are situations of asymmetric enforcement. If some firm knows the government is less likely to enforce certain terms of the contract, it can bid more. The special relationship with the government is converted into an advantage in bidding, even if the government does not overtly intervene in the auction process.

33. For a more general discussion of these issues, see Hoff and Stiglitz (2005).

34. See Stiglitz (2006) and Hoff and Stiglitz (2005) for a more extensive discussion of these issues.

35. There are, in effect, significant externalities; with so many pulling capital out of the country, output and returns are lower. Even those who did not need to move their capital abroad to protect it might, under these circumstances, find it more attractive to invest their money in the booming economy of the United States rather than the depressed economy of Russia. This can be formally modeled as a prisoner’s dilemma Nash equilibrium: Pareto efficiency requires that all keep their money in the country; but it is in the interest of each to pull his money out. In other formulations, there is a coordination failure problem. There are multiple equilibria; one entails everyone pulling their money out, the other entails everyone leaving their

money in. The latter Pareto dominates the former. Changing the rules of the game—making it illegal to take your money out—essentially forces the economy into the good equilibrium.

36. There is a fifth set of problems related to the details of the contract. If the contract has a royalty provision which cannot be reset, then extraction stops when the net receipt by the oil company—net of the royalty payment—is zero; there is still a positive economic return to extracting oil.

37. See Stiglitz (2002) and Freeland (2000) for a more extensive discussion of Russian privatizations.

38. There are difficult problems in ascertaining the value, partly because of incentives (both for tax reasons and for reasons noted earlier) to report a lower value for the resources extracted than the true market value.

39. Actually, they were sufficiently astute that they provided little of their own money; mostly, they discovered how to use the government's own resources to get Yeltsin reelected.

40. I participated in a seminar with senior government officials in Moscow in March 1994, in which the central issue was about how to draw a line on the past. The officials shared a perception that between a trillion and a trillion and a half of assets had been stolen and, unless a significant fraction of that was somehow recovered, it would be difficult to move forward. The defenders of the theft point out that the assets would not have been worth so much, but for the efforts of the oligarchs to restructure them.

41. As always, matters are more complicated. The Russian government was also desperately in need of money. The government, however, was effectively forced to borrow from the private banks (much of the money in which came from deposits by government corporations). If the Central Bank had been allowed to lend the government money, or if the West had lent them more money in the short term, then the government would not have had to turn to the private banks in what looked like little more than a charade intended to mask the turning over of vast amounts of public resources to private hands.

42. The case of Chad (where a trust account was set up, but the government renegeed on the agreement not long after oil revenues started to be generated) is telling. This is an argument for why it may be a mistake for multilateral institutions to help countries governed by corrupt dictators. Even though the country is desperately poor it would nonetheless likely be better off waiting.

43. Obviously, since different strategies of development entail different risks, and the proceeds are stochastic, a more refined analysis would take into account (with appropriate shadow prices) this variability. What matters is not just what actually happened, but also what might have happened.

44. One should really focus on green net national product—not the adjusted output produced within the country but the income (increment of wealth) of the citizens of the country. When countries sell their assets to foreigners at below fair market value, their national wealth is diminished. In many cases where this happened, governments spent the proceeds on consumption, and the country experienced a mini-boom. In other words, it appeared that privatization led to an increase

in GDP. This highlights how different measures can give different perspectives on the benefits of a so-called reform.

45. Chile's government seems similarly to run its copper mines efficiently, and to receive a large return—larger than it receives (on a comparable basis) from the privatized mines.

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