

"Much has been written about the topic of how oil wealth hampers economic development as well as the building of institutions, but this book will help introduce a much wider audience to this issue. Ross has produced a comprehensive examination of the oil curse, analyzing data from 170 countries. . . . [T]his is a valuable and accessible study of an important topic."

—*Choice*

"Michael Ross is an eminent political scientist, who distinguishes himself even further with this book. . . . Ross's book is readable, and provides substance and nuance to the basic underlying story that resource revenues are hard to manage."

—Mark Henstridge, Business Economist

"His study is nuanced, well documented and precise: he avoids the lure of statistical analysis where a huge database can lead to clichés and easy conclusions. Instead, his statistical analysis is always backed by qualitative comparative analysis. Ross successfully demonstrates what the 'oil curse' means, without falling into the trap of determinism. Instead, he offers alternatives. Oil exporting countries, and mainly oil exporters, should act upon them: with adequate policies, the oil curse can be reversed."

—J.M., *Global Journal*

---

## The Oil Curse

HOW PETROLEUM WEALTH SHAPES  
THE DEVELOPMENT OF NATIONS

*Michael L. Ross*

PRINCETON UNIVERSITY PRESS

PRINCETON AND OXFORD

## The Trouble with Oil Revenues

The spirit of a people, its cultural level, its social structure, the deeds its policy may prepare—all this and more is written in its fiscal history, stripped of all phrases. He who knows how to listen to its message here discerns the thunder of world history more clearly than anywhere else.

—Joseph Schumpeter, “The Crisis of the Tax State”

JUST AS PEOPLE are affected by the kinds of food they eat, governments are affected by the kinds of revenues they collect. Since most governments receive the same kinds of revenues year after year, it is easy to overlook their significance. Only when there is a sharp change in these revenues, such as when oil is discovered, does their underlying importance become clear.

Oil revenues are marked by their exceptionally large size, unusual source, lack of stability, and secrecy. These four qualities reflect both the historic organization of the petroleum industry, and the revolutionary changes of the 1960s and 1970s that transformed the oil-producing world.

### THE SCALE AND SOURCE OF OIL REVENUES

The petroleum industry generates a lot more government revenue than other kinds of industries. This makes the governments of oil-producing countries bigger than the governments of similar countries without oil.

Consider Nigeria, which became a major oil producer after the conclusion of the Biafra War in the late 1960s (see figure 2.1). From 1969 to 1977, the volume of oil that Nigeria produced grew by 380 percent, while the real price of oil almost quadrupled. The Nigerian government's total revenues—from oil and all other sources—rose from \$4.9 billion to \$21.5 billion over these eight years, after accounting for inflation. At the same time, government spending rose from about 10 percent to more than 25 percent of the Nigerian economy. Not only did the

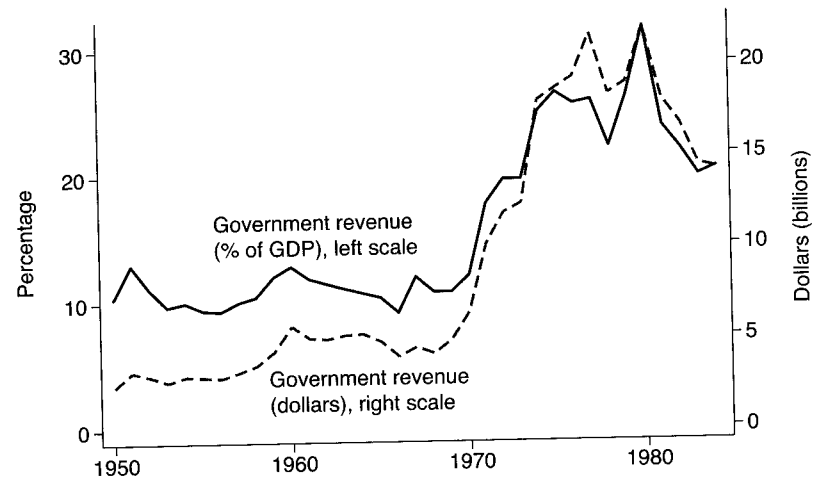


Figure 2.1. Size of the Nigerian government, 1950–1984

Sources: The figures on government revenues in dollars are from Bevan, Collier, and Gunning 1999; the figures on government revenues as a fraction of the GDP are from Heston, Summers, and Aten, n.d., table 6.2.

Nigerian government expand quickly; it expanded more quickly than the rest of the Nigerian economy.<sup>1</sup>

Azerbaijan and Equatorial Guinea became significant petroleum exporters in the early 2000s, at the same time that oil prices were rising. From 2001 to 2009, the value of government expenditures rose by 600 percent in Azerbaijan and 800 percent in Equatorial Guinea, after accounting for inflation.<sup>2</sup>

Because governments often conceal the true scale of their oil revenues, it is hard to accurately measure the state's size in oil-producing countries. But even bad data—which almost certainly understate the actual size of oil-rich governments—are suggestive. Figure 2.2 displays the oil incomes of 134 countries (on the horizontal axis), and the estimated size of their governments, as a fraction of their country's economy (on the vertical axis). As the upward-sloping line indicates, the more oil a country produces, the larger its government.

<sup>1</sup>Bevan, Collier, and Gunning 1999.

<sup>2</sup>Before accounting for inflation, government spending in Azerbaijan rose twelvefold and about thirteenfold in Equatorial Guinea. These estimates are based on the IMF's 2005 and 2010 article IV reports for the two countries.

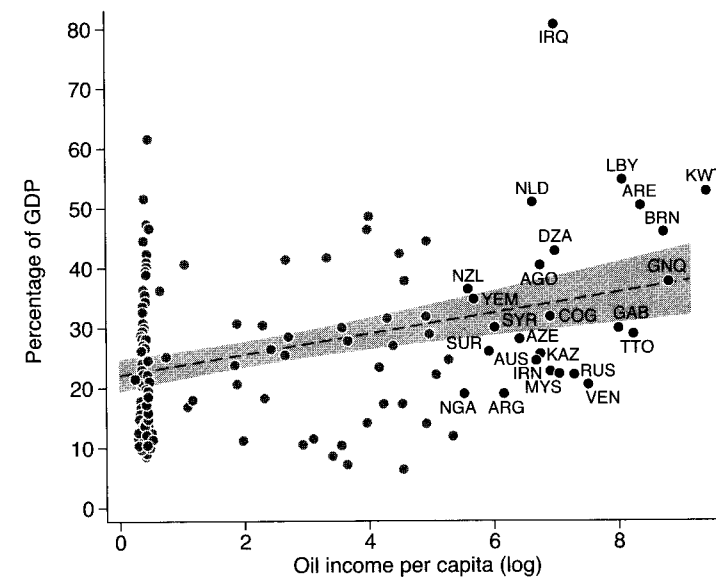


Figure 2.2. Oil and the size of government

The vertical axis shows the size of government revenues as a fraction of a country's GDP.

Source: The data on government revenue are from IMF article IV reports, for the most recent year (between 1997 and 2007) for which data are available; the figures on oil income are for the same year.

How much of a difference does oil make? One way to answer this question is to compare the governments of oil-producing countries with those of neighboring states with similar incomes but no oil (see figure 2.3). In these examples, the oil-funded governments are from 16 percent (Azerbaijan versus Armenia) to 250 percent (Algeria versus Tunisia) larger than the neighboring states without oil.

Another way to answer this question is compare the size of government in countries with significant oil income (which I define as a hundred dollars per capita in a given year, using constant 2000 dollars) with those that earn less, using simple cross-tabulations (see table 2.1). Again, the oil-producing states have dramatically larger governments—about 45 percent larger, on average.<sup>3</sup>

<sup>3</sup>In this table, and all subsequent tables with cross-tabulations, I use standard difference-of-means tests to indicate whether the oil-producing states are significantly different from the non oil-producing states.

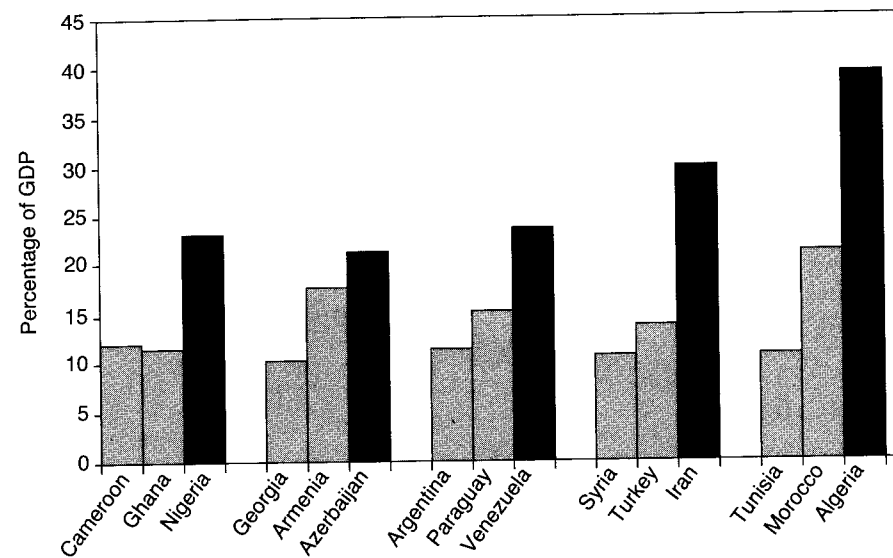


Figure 2.3. Government size in selected oil and non-oil states

The bars show the size of each country's government as a fraction of the country's economy. The darker bars are oil-producing states.

Source: The data on government revenue are from IMF article IV reports, for the most recent year (between 1997 and 2007) for which data are available.

Thanks to the scale of these revenues, petroleum wealth also has a powerful impact on the source of the government's funding. Most governments are funded by taxes. But as a country's oil wealth grows, its government becomes decreasingly reliant on taxes and increasingly reliant on "nontax revenues." Table 2.2 displays the link between a coun-

TABLE 2.1  
Size of government, 2003

The numbers show the total government revenues as a percentage of GDP.			
	Non-oil producers	Oil producers	Difference
Low income (below \$5,000)	21.2	27.7	6.5**
High income (above \$5,000)	32.8	44.6	11.8*
All countries	23.5	33.2	9.6**

\*significant at 5%

\*\*significant at 1%

Source: The calculations are based on IMF Article IV reports for 2003; for countries where these figures are missing, I used the most recent prior year for which IMF data were available.

TABLE 2.2  
Taxes on goods and services, 2002

The numbers show the taxes on goods and services as a percentage of government revenue.

	Non-oil producers	Oil producers	Difference
Low income (below \$5,000)	32.8	24.9	-7.9**
High income (above \$5,000)	29.6	24.1	-5.5*
All countries	31.6	24.5	-7.1***

\*significant at 10%, in a one-tailed t-test

\*\*significant at 5%

\*\*\*significant at 1%

Source: Calculations based on data from World Bank n.d.

try's oil industry and its government's dependence on taxes. In both low- and high-income countries, and in both autocracies and democracies, oil producers are about 30 percent less dependent than non-oil countries on taxes on goods and services.

It may seem unremarkable that when countries are more reliant on oil revenues, they become less reliant on taxes. But this understates the impact of oil revenues. The oil industry generates more revenues than other industries of similar size, and when governments receive more oil revenues, they tend to respond by collecting less revenue from taxes. As a result, the governments of oil-producing countries are not merely dependent on petroleum revenues; they are disproportionately dependent on them, and disproportionately liberated from taxes.<sup>4</sup>

If governments received funding from all industries in proportion to their contribution to the national economy, the government's finances would mirror the composition of the economy. If one-quarter of the nation's income came from oil, for instance, so would one-quarter of the government's revenues. But this is almost never the case, as figure 2.4 shows for the leading thirty-one hydrocarbon-rich countries. On average, the oil sector makes up 19 percent of the economy in these states, but funds 54 percent of the state's budget.

The link between higher oil revenues and lower taxes should not be surprising. Governments find it bureaucratically easier and politically more popular to collect revenues from their oil sectors than to collect taxes from the population at large. It also makes economic sense, at

<sup>4</sup>See Bornhorst, Gupta, and Thornton 2009; McGuirk 2010. This also means that governments in oil-producing countries would be even larger than they are if they kept taxes at "normal" levels.

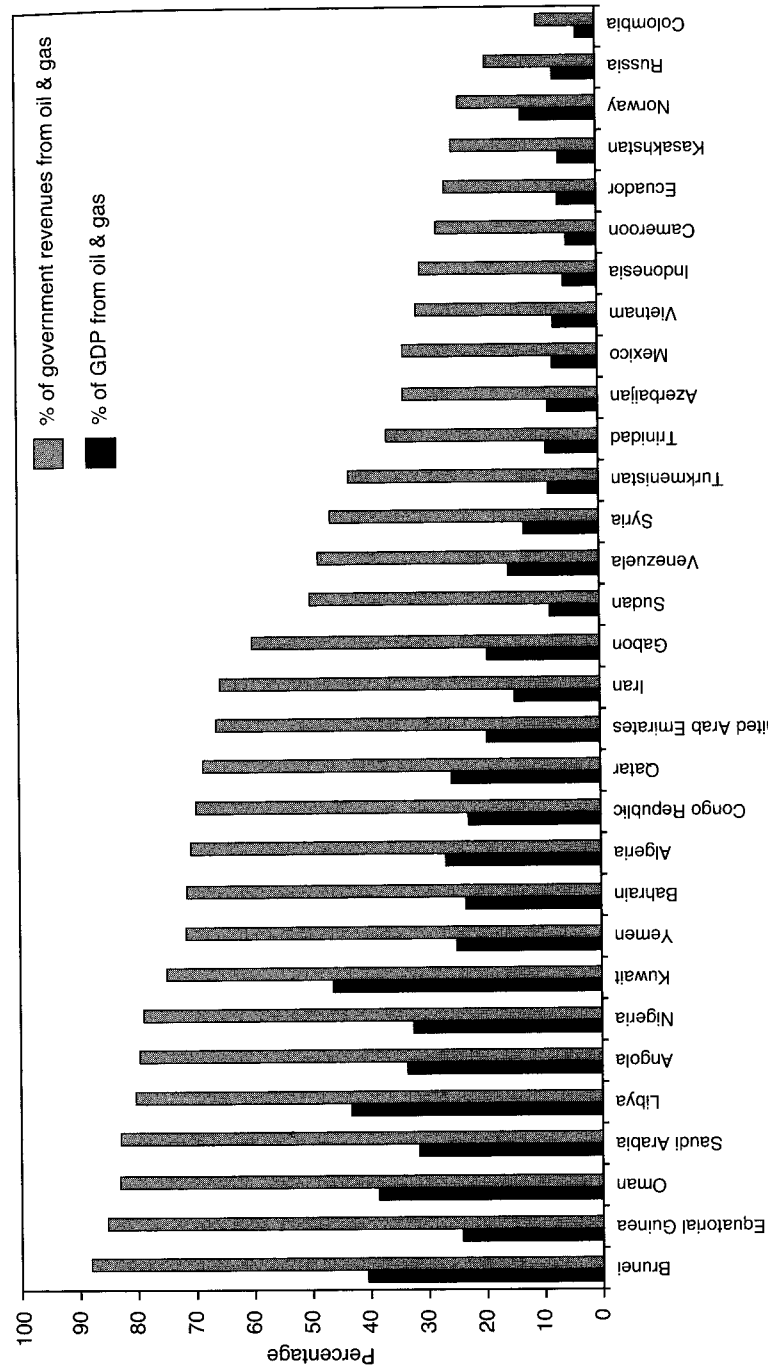


Figure 2.4. Petroleum in the economy and government, 2007  
 The dark bars show the value of petroleum as a fraction of the economy; the light bars show the value of petroleum revenues as a fraction of all government revenues.  
 Source: Bornhorst, Gupta, and Thornton 2009.

least up to a point. When the treasury is brimming with oil revenues, the government can transfer some of these funds to the public by cutting taxes. As we will see in later chapters, though, the government's dependence on oil revenues has far-reaching consequences for a country's politics and economy.

The distinctive size and source of oil revenues have their origins in the same unusual features of the petroleum world: the government's ownership of petroleum reserves; the industry's extraordinary profits, which since the 1970s have been largely captured by governments; and the industry's relatively small *direct* impact on the rest of the economy.

#### Government Ownership

In almost all countries, petroleum reserves are owned by governments. State ownership affects both the size and source of oil revenues. It gives governments a much larger claim on the industry's revenues, and allows them to collect these revenues directly, without having to tax private-sector companies.<sup>5</sup>

Governments have claimed ownership of mineral rights since at least the time of the Roman Empire, when mines and minerals belonged to the state by right of conquest. The Roman tradition of state ownership took root in early modern Europe, mostly through a series of royal decrees: in the German region by Frederick I, the Holy Roman emperor, in the twelfth century; in Britain, by King Richard I and King John in the late twelfth and early thirteenth centuries, and a 1689 act of Parliament; in Spain, through the 1383 decree of King Alfonso XI; and in France, through long-standing traditions that were codified in the Napoleonic Law of 1810.

This heritage is still reflected in the term "royalty," which according to the *Oxford English Dictionary* means both "the prerogatives, rights, or privileges" of a monarch, and "a payment made . . . by a producer of minerals, oil, or natural gas to the owner of the site."

When the modern age of oil production began in the early twentieth century, government ownership of subsoil minerals was well established in Europe. The British Crown already claimed ownership of gold and silver deposits; with the Petroleum Act of 1918, it established ownership of all petroleum deposits as well. From Europe, the principle of

<sup>5</sup>For heuristic purposes, I assume that governments collect all of their oil revenues through non-tax instruments like royalties, concession fees, and transfers from their national oil companies; in reality, governments also earn money from their oil sectors by taxing the private companies that work in the oil business. I return to this point in chapter 7.

sovereign ownership was passed on through colonial rule to the legal codes of countries around the world.<sup>6</sup>

Today, only one country allows the widespread private ownership of oil reserves: the United States.<sup>7</sup> When miners flocked to California during the gold rush in 1849, the United States had no applicable mining laws. To protect their rights and regulate disputes, miners had to establish their own rules. State and federal laws gradually recognized these local claims and regulations, and codified the right of anyone who improved a mine to purchase its title from the government at a reasonable price. This “bottom-up” process led to a system that is unusually favorable to private ownership and unique among the world’s major oil producers.<sup>8</sup>

### Generating Rents

While government ownership is important, it may or may not lead to large nontax revenues. Governments sometimes own other types of enterprises like steel factories and automobile plants that lose money. But thanks to the availability of extraordinary profits, or *rents*, the government’s ownership of oil can be astoundingly profitable.

In most industries, firms typically earn a “normal” profit, determined by the laws of supply and demand. If their profits were much below this normal rate, some of the firms would leave the industry, which would raise profits for the remaining firms. If their profits were much above the normal rate, new companies would enter their industry to compete for these exceptional returns, which would drive profits down to normal levels. Companies in the oil business, however, can

<sup>6</sup>Elian 1979; Bunyanunda 2005.

<sup>7</sup>Not all US reserves are privately owned. The government owns the offshore oil reserves, which account for about a quarter of US production. Reserves beneath public lands can also be government owned.

Jones Luong and Weinthal (2010) point out that there are important differences in ownership patterns across countries. I return to the issue of ownership and privatization in the concluding chapter.

<sup>8</sup>On the evolution of US mining laws, see Libecap 1989. As Gavin Wright and Jesse Czelusta (2004, 11) point out, this does not mean that the United States had a well-functioning system of mineral rights:

Much of the best US mineral land was transferred into private hands outside of the procedures set down by federal law. Nearly 6 million acres of coal lands were privatized between 1873 and 1906, for example, mostly disguised as farmland. Most of the iron lands of northern Minnesota and Wisconsin were fraudulently acquired under the provisions of the Homestead Act.

earn rents—profits above and beyond production costs, where the costs include a normal rate of return on the capital invested.

There are two broad conditions that generate rents in the petroleum or any other extractive industry. One is favorable geography, which gives some producers access to cheaper and better-quality oil than their competitors. Some reserves yield oil of relatively low quality at a high price and earn only a normal profit, but others yield high-quality oil at a low cost and hence will generate “differential” rents for the owner.<sup>9</sup> Since there is a limited supply of fields with low extraction costs and high-quality oil, new companies that enter the petroleum business cannot easily obtain these rents.

Producers can also earn “scarcity” rents when the demand for oil temporarily outpaces the supply. In theory, the supply of oil will eventually catch up with the demand, or the demand will eventually fall to meet the supply. But these adjustments can take years, either because oil supplies are growing scarce, or even if they are not scarce, because the price elasticity of the supply is relatively low, meaning that it takes a long time for producers to deliver more oil to the market in response to higher prices.

Figure 2.5 shows the magnitude of these rents in 2008 for eleven leading exporters. The black bars show the average cost of producing a barrel of oil, and the gray bars show its approximate price on the world market, reflecting differences in each country’s oil quality. At the end of 2008, average extraction costs per barrel ranged from about US\$1.80 in Saudi Arabia to US\$31.40 in Canada, while prices ranged from US\$38 in Canada to US\$53 in Nigeria. The difference between these two figures was the rent, which ranged from about US\$6 per barrel in Canada to US\$42 per barrel in Nigeria.<sup>10</sup>

Scholars have long been fascinated by rents. In *Principles of Political Economy*, John Stuart Mill suggested that the concept of rent

is one of the cardinal doctrines of political economy; and until it was understood, no consistent explanation could be given of many of the more complicated industrial phenomena. The evidence of its truth will be manifested with a great increase in clearness.<sup>11</sup>

<sup>9</sup>This type of rent—produced by innate differences in the quality or production costs of a good—is sometimes called “Ricardian” rent, since it was first described by nineteenth-century economist David Ricardo.

<sup>10</sup>The estimates of rents are admittedly rough; these figures are based on data produced by Kirk Hamilton and Michael Clemens (1999), and updated to account for inflation.

<sup>11</sup>Mill [1848] 1987, 16:3. Many social scientists argue that the pursuit of rents is the root of much evil, including economic waste, corruption, and violence. See, for example, Krueger 1974; Buchanan, Tollison, and Tullock 1980; Colander 1984. It is easier to construct theories about rents, however, than to test their validity.

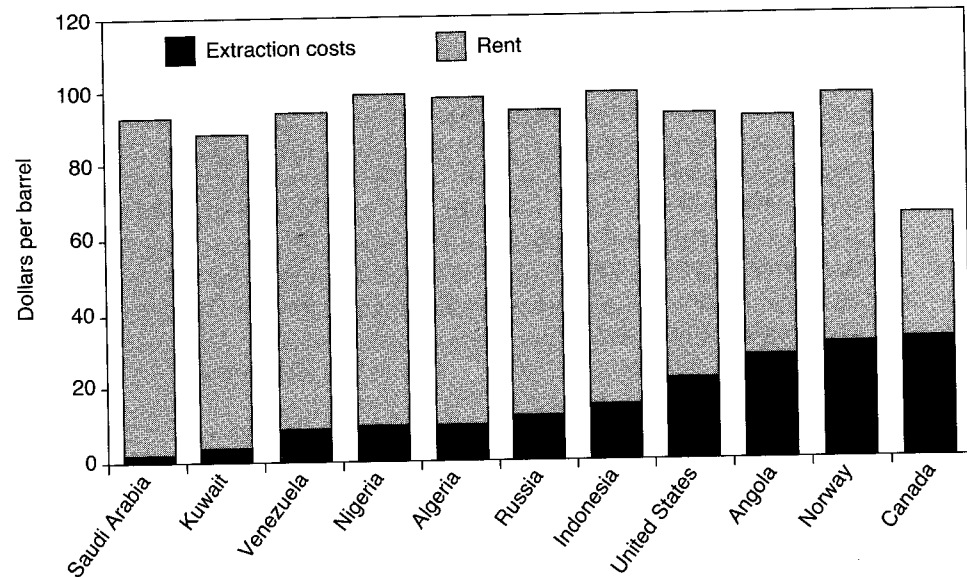


Figure 2.5. Oil prices and oil rents in selected countries, 2008

The height of the bars represent the price of exported oil from each country in January 2008. The darker sections show the extraction costs, and the lighter sections show the rents.

Sources: The oil prices are taken from the Energy Information Administration Web site, available at <http://www.eia.doe.gov> (accessed January 25, 2009); the extraction costs, adjusted for information, are taken from Hamilton and Clemens 1999.

Much of the politics of oil is shaped by the struggle between oil companies and governments for control of these rents. According to long-established principles, rents that come from the sale of an asset should belong to the asset's owner. I may hire a company to transport my collection of gold coins, which I store in a bank vault, to my house, but this does not entitle the transport company to keep some of the coins, once I pay the normal transport fee. Similarly, a government may give a company the right to extract oil from state-owned reserves, but this does not entitle the firm to retain any oil rents.

Before the changes of the 1960s and 1970s, the size of the oil firms and their ability to collude made it almost impossible for governments to collect the rents from oil companies that by right should have gone to the state. In theory, governments could have used market competition to force companies to pay rents—for example, by auctioning off concession rights to the highest bidder. In practice, the major oil companies

refused to bid against each other, leaving host governments with little choice but to sign unfavorable contracts.

The oil companies had another advantage: their size and secrecy gave them innumerable ways to conceal their revenues from the government. The major companies were vertically integrated, meaning that they controlled every stage of the oil business: the same corporate entity that pumped crude oil out of the ground in one country would also transport it around the globe, refine it into gasoline, and ultimately pump it into the consumer's gas tank in another. This made it relatively easy for the companies to hide extra profits through transfer pricing—shuffling their revenues from an arm of the company that was subject to the jurisdiction of the host government to another arm that was not.

This allowed the major oil companies to earn exceptional returns on their investments in the non-Western countries. According to one estimate, in the mid-1950s the major oil companies were earning net profits of 60 to 90 percent on their investments in the Middle East and East Asia *after* their payments to host governments. Another study, carried out by the US Department of Commerce, found that in 1960, US petroleum companies had earned after-tax profits representing a 50 percent return on the book value of their investments in the Middle East, and a 29 percent return on their investments in Venezuela.<sup>12</sup> By any measure, these companies made extraordinary profits from their operations in developing countries.

#### Capturing Rents

In the 1950s, governments in the developing world nominally owned their nations' oil wealth, but most received only a fraction of the available rents. Often they could not even control how much oil was taken out of their soil and exported overseas. All of this was changed by the wave of nationalizations that swept the global oil industry in the 1950s, 1960s, and 1970s.

The first governments to nationalize their oil production were Argentina (1910), the Soviet Union (1918), Bolivia (1937), and Mexico (1938). Yet before World War II, nationalizations were rare. As late as 1950, the Seven Sisters controlled 98 percent of the world's traded oil, outside the United States and the Communist bloc.<sup>13</sup>

<sup>12</sup>Hartshorn 1962.

<sup>13</sup>Levy 1982.

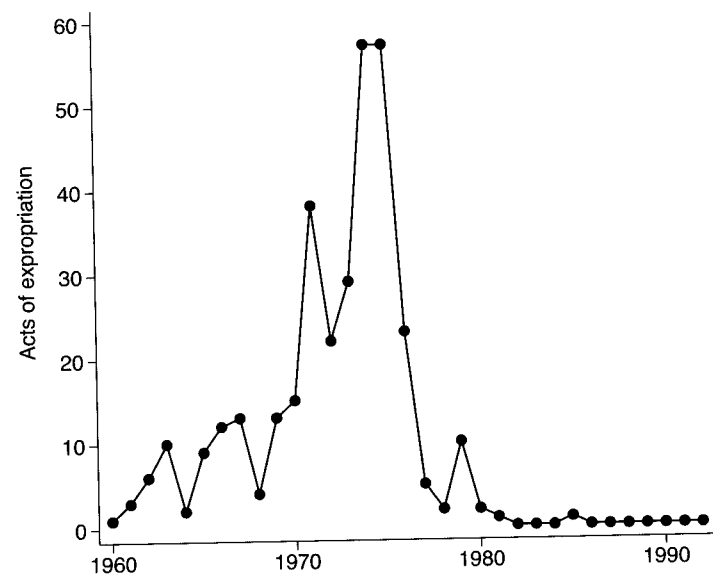


Figure 2.6. Government expropriation of oil companies, 1960–1993

The line indicates the number of significant “acts of expropriation” around the world during each calendar year, defined as “formal expropriation, forced sales, contract renegotiations, and extralegal interventions” in oil companies. A single company may be subjected to several acts of expropriation over time.

Sources: Kobrin 1980; Minor 1994.

Between 1950 and 1970, however, the balance of power between oil companies and host governments changed dramatically. As economic historian Edith Penrose wrote in 1976,

Exploration and production concessions granted in the early days have been repeatedly re-negotiated, invariably in favour of the countries; where the concessions covered a very large proportion of a country’s drilling area, they have been reduced in size; stiffer regulations respecting drilling requirements, reservoir maintenance and similar matters have been introduced; and financial arrangements of all kinds have improved in favour of the countries.<sup>14</sup>

The shift in power from corporations to governments culminated in a wave of expropriations, which peaked between 1971 and 1976 (see figure 2.6). By 1980, almost all developing countries had nationalized their petroleum industries and established national oil companies (NOCs) to

<sup>14</sup>Penrose 1976, 198.

manage them. According to Stephen Kobrin, “The net result was a revolutionary transformation of the international petroleum industry.”<sup>15</sup> After 1985, the number of new expropriations fell sharply, not because sentiments had shifted, but because in non-Western countries, the governments had seized most of the available oil-sector assets.

The nationalizations of the 1960s and 1970s allowed governments to capture a higher share of the oil rents. In the 1950s, most major oil producers had “fifty-fifty” arrangements with international oil companies, which were supposed to give each party half of the profits from oil sales. But thanks to their size and vertical integration, the companies could readily conceal their profits from the host governments—leaving the governments uncertain if the companies were meeting their commitments. According to one study, expropriations raised the government’s share of oil profits from 50 percent in the early 1960s to 98 percent by 1974.<sup>16</sup>

In gaining control over their oil industries, governments also gained control over the pace of oil production. The Seven Sisters had, in particular, stifled Iraq’s oil industry. Despite its remarkable petroleum reserves—second only in size to Saudi Arabia’s, and similarly cheap to extract—the foreign-owned Iraqi Petroleum Company (IPC) placed sharp limits on oil production in order to keep global prices from falling. After the Iraqi government nationalized the IPC in 1972, it more than doubled production over the next seven years.

#### WHAT CAUSED THIS WAVE OF NATIONALIZATIONS?

One factor was the rise of the nationalist sentiment in the developing world in the 1950s and 1960s that accompanied decolonization. These sentiments were entangled with antipathy toward foreign firms, whose local subsidiaries were often established during and closely associated with colonial rule. This made the nationalization of foreign oil companies popular.

In Mexico, for example, the expropriation of foreign oil companies in 1938 was received with such enthusiasm that the day it took place, March 18, has been celebrated as a holiday ever since. In 1951, Iranian prime minister Mohammed Mossadegh was compelled to nationalize the British-owned Anglo-Iranian Oil Company (AIOC) after his predecessor—who argued against nationalization—was assassinated. The takeover of the AIOC was greeted with exuberant celebrations and a special national holiday.<sup>17</sup>

<sup>15</sup>Kobrin 1980, 17. See also Jodice 1980; Minor 1994.

<sup>16</sup>Mommer 2002.

<sup>17</sup>Yergin 1991, 463.



Politicians linked to these nationalizations sometimes gained great acclaim. In Iraq, the takeover of the IPC was organized by the under-secretary general of the Revolutionary Command Council—Saddam Hussein—burnishing his public image and boosting popular support for the Baath Party. According to one biographer, the nationalization of the IPC became Hussein's "gateway to fame."<sup>18</sup>

Shortly after Libya's Muammar Qaddafi came to power in a 1969 military coup, he began to nationalize his country's oil industry. This led to a flood of new revenues, which allowed him to buy off powerful tribal chiefs, and fund his "revolutionary" agenda.

For all of their popularity, these nationalizations would not have been possible without a second development: the decline in the bargaining power of the major oil companies. Until the early 1960s, few governments dared challenge the oil majors, which tightly controlled the global oil trade. Any government that asserted control over its country's oil industry would be unable to sell its oil abroad, since the Seven Sisters controlled almost all distribution and marketing channels. Governments that nationalized paid a heavy price. After Mexico nationalized its oil industry in 1938, international companies boycotted its crude, denied it the use of tankers, and refused to sell it, a critical additive for gasoline.<sup>19</sup> When Iran nationalized the AIOC in 1951, it was slapped with a crippling embargo, and after two years of refusing to yield, the Mossadegh government was overthrown by a coup led by the US and British secret services. After the shah was restored to power, he effectively reversed the AIOC's nationalization.<sup>20</sup>

But in the 1950s and 1960s, the bargaining power of the major oil firms began to deteriorate. One reason was the rise of "independent" oil producers that reduced the market share of the oil majors; these included Getty Oil, Standard Oil of Indiana, the Italian state-owned ENI, and the Soviet Union. Equally important was the rise of smaller companies that could provide governments with specialized exploration, drilling, and engineering services that were once only available from the Seven Sisters.

Another factor was the 1960 founding of OPEC. At first, OPEC members simply shared previously secret information about their contracts with the oil companies. Over time they developed coordinated negotiating strategies, which ultimately improved the terms of their contracts.

Also important was the growing reluctance of the major Western powers—the United States, France, and Britain—to use military force to protect their economic interests abroad. The joint US-UK operation

<sup>18</sup>Coughlin 2002, 108.

<sup>19</sup>Krasner 1978.

<sup>20</sup>Mahdavi 2011.

to overthrow Iran's Mossadegh government in 1953 was considered a success at the time. But the next two decades witnessed humbling military setbacks for the major Western powers, including France in Vietnam and Algeria, Britain and France in the 1956 Suez Crisis, and the United States in Vietnam and Cambodia. By the late 1960s, the Western powers had grown reluctant to send their troops abroad to protect friendly regimes or overthrow hostile ones.

Finally, the bargaining position of the host governments improved over time thanks to the unusual qualities of the oil business. The extraction of oil requires large up-front investments, which are used to purchase highly specific assets—things like concessions, wells, pumping stations, and pipelines that cannot be easily moved to other places, or used for other purposes. Once companies make these investments, it becomes prohibitively expensive for them to withdraw, since they would have to leave these investments behind.

This presents companies with what economists call a "time-consistency" problem. Before the initial investments, companies are in a strong bargaining position and can negotiate highly favorable contracts with host governments. But once they make their investments, companies lose much of their bargaining power—leaving host governments free to abrogate any contract terms they dislike, with little fear that the companies will withdraw their investments.<sup>21</sup>

As long as the oil majors had exclusive control over the shipping and distribution of oil, and were backed by the military power of their home governments, they retained enough bargaining power to enforce their contracts with governments. When the rise of the independent oil companies broke the oligopsony of the Seven Sisters, and the Western powers grew reluctant to use force abroad, however, there was little to stop the host governments from breaking their contracts with the oil majors, and replacing them with their own national oil companies.

Since the 1970s, national oil companies have dominated the global petroleum supply. A handful of countries—notably Mexico and Libya—expelled foreign companies and foreign workers, and ran their petroleum industries with little international assistance. Yet in most countries the international oil companies (IOCs) continued to play a role, thanks to their access to capital, technical skills, and international marketing networks.

Today the relationships between NOCs and private companies vary widely in form.<sup>22</sup> In a handful of countries—mostly in the Middle

<sup>21</sup>Raymond Vernon (1971) refers to this problem as "the obsolescing bargain."

<sup>22</sup>For a discussion of the many forms that these contracts may take, see Johnston 2007. Paul Stevens (2008) suggests that there have been cycles of resource nationalism, especially in the Middle East.

TABLE 2.3  
World's largest oil and gas firms, by market capitalization, 2005

Rank	Company	Ownership	Market capitalization (US\$ billion)
1	ExxonMobil	Private sector	349.5
2	BP	Private sector	219.8
3	Royal Dutch Shell	Private sector	208.3
4	Gazprom (Russia)	Hybrid	160.2
5	Total	Private sector	154.2
6	Petrochina	State controlled	146.6
7	Chevron	Private sector	127.4
8	Eni	Private sector	111
9	ConocoPhillips	Private sector	80.7
10	Petrobras (Brazil)	Hybrid	74.7
11	Lukoil	Private sector	50.5
12	Statoil (Norway)	Hybrid	50.3
13	Sinopec (China)	State controlled	48.7
14	Surgutneftegaz (Russia)	Hybrid	45.8
15	ONGC (India)	State controlled	37.2

Source: PFC Energy, available at <http://www.pfcenergy.com>.

East—NOCs exercise day-to-day operational control of the industry and only hire international companies on service contracts to carry out specific tasks. In most other countries, governments have signed concession agreements, production-sharing agreements, or joint ventures with foreign companies, giving the companies greater control over day-to-day operations.

The business of oil is now run by a combination of NOCs, private-sector firms, and hybrid companies that combine state and private ownership. Most are so large and complex that it is difficult to know their true value. Companies that are publicly listed on a stock exchange can be measured by the market value of their outstanding stock. By this measure, the world's largest oil firms in 2005 were ExxonMobil, BP, and Royal Dutch Shell (see table 2.3). But firms that are wholly owned by states are not publicly listed. If we use an alternative measure—the size

TABLE 2.4  
World's largest oil and gas firms, by proven reserves, 2005

Rank	Company	Ownership	Oil reserves (barrels)
1	Saudi Aramco	State controlled	262
2	National Iranian Oil Co.	State controlled	125
3	Iraqi National Oil Co.	State controlled	115
4	Kuwait Petroleum Corp.	State controlled	101
5	Abu Dhabi National Oil Co.	State controlled	98
6	PDVSA (Venezuela)	State controlled	77
7	Libya NOC	State controlled	39
8	Nigerian National Petroleum Corp.	State controlled	35
9	Lukoil	Private sector	16.1
10	Qatar Petroleum	State controlled	15.2
11	Rosneft (Russia)	State controlled	15
12	PEMEX (Mexico)	State controlled	14.6
13	Sonatrach (Algeria)	State controlled	11.8
14	ExxonMobil	Private sector	10.5
15	BP	Private sector	9.6

Sources: EIA Annual Energy Review 2007, available at <http://www.eia.doe.gov>, company reports; oil reserve figures are approximate and vary slightly by source.

of a company's proven oil reserves—nine of the top ten companies are NOCs (see table 2.4). A 2003 study found that NOCs controlled about 80 percent of global oil reserves and 75 percent of global production.<sup>23</sup>

Even before the nationalizations of the 1950s and 1960s, the governments of oil-producing countries were accruing large and sometimes even colossal petroleum revenues. But the shift toward national ownership enabled them to gain full control over their oil industries and initiate—and benefit from—the sharp increases in oil prices of the 1970s.

<sup>23</sup>McPherson 2003.

*Oil and the Private Sector*

Oil may boost the government's revenues, but why should it cause the state to grow more quickly than the rest of the economy? How come oil production does not lead to equally fast growth in the private sector? In fact, economic theories popular in the 1950s and 1960s suggested that resource booms typically produce a diversified pattern of growth in private enterprise.<sup>24</sup> Yet the private-sector benefits of oil booms largely come from increased government spending, especially in low-income countries. Understanding the reason helps explain why oil causes governments to grow *relative* to the private sector: while oil boosts the government's revenues, it does much less to help—and can even harm—other industries in the private sector.

There are three forces behind this odd pattern. The first is government ownership of oil reserves. If a country's subsoil assets were privately owned, extracting petroleum would enrich private companies more and governments less. The state's sovereign rights over oil deposits helps limit the impact of oil production on the private sector.

The second is the "enclave" nature of most oil projects. Even when the state controls the extraction, processing, and transportation of petroleum, we still might expect these activities to stimulate growth in other parts of a country's economy.

But the petroleum business typically operates in an enclave. In some cases, companies literally work in geographic enclaves—isolated, self-contained areas like offshore oil-drilling rigs. This is not always true, though. Sometimes the machinery of oil extraction stretches for hundreds or thousands of miles. According to one study, in 2006 Nigeria had 5,284 onshore and offshore wells, 7,000 kilometers of pipelines, 275 flow stations, ten gas plants, ten export terminals, four refineries, and three gas liquefaction plants.<sup>25</sup> Still, oil production generally takes place in an *economic* enclave, meaning it has few direct effects on the rest of the economy.<sup>26</sup>

To highlight this problem, consider for a moment a different type of economic activity: manufacturing. Growth in a country's manufacturing sector will stimulate growth in the rest of the economy through at least three pathways: its employees will buy goods and services produced by other firms (the "employment effect"); its employees will learn skills that they can take to future jobs (the "learning-by-doing" effect); and

<sup>24</sup>Spengler 1960; North 1955; Watkins 1963.

<sup>25</sup>Lubeck, Watts, and Lipschutz 2007.

<sup>26</sup>This problem, and the need for "fiscal linkages" to replace the missing "forward" and backward linkages between the mineral sector and the rest of the economy, was first articulated in Hirschman 1958.

the manufacturing companies themselves will buy goods from other companies, to use as inputs for their products (the "backward linkage" effect). Studies in a wide range of countries have documented the scale and importance of these spillover effects.<sup>27</sup>

Yet none of these three pathways work well in the oil sector, for two reasons.

First, oil exploration and production are extraordinarily capital intensive: they use a lot of expensive equipment but relatively little labor.<sup>28</sup> Saudi Arabia is the world's largest petroleum producer, and oil and gas account for about 90 percent of the country's GDP. Yet the entire petroleum and minerals sector employs just 1.6 percent of the active labor force, and 0.35 percent of the total population.<sup>29</sup> The growing popularity of offshore drilling is making the industry even more capital intensive. A single deepwater platform can cost over \$500 million to build and may rent for over \$200 million a year. Once in place, however, it operates with fewer than two hundred people, often expatriates, who live aboard the rig.<sup>30</sup>

One way to measure capital intensity is to divide a company's investments in property and equipment by the number of workers it hires. A recent study of US businesses operating overseas found that textile companies made \$13,000 worth of investments per employee, making it the industry with the lowest capital intensity. Oil and gas companies spent \$3.2 million per employee, making it by far the most capital-intensive industry (see figure 2.7).<sup>31</sup>

Since the oil sector creates relatively few local jobs, both the employment and learning-by-doing effect tend to be small.

Second, oil producers buy relatively few inputs from local firms and thus generate few backward linkages to the local economy. Oil companies use a lot of equipment, but this equipment tends to be highly specialized and manufactured in high-income countries. Most deepwater drilling rigs, for example, are made in Singapore or South Korea. For

<sup>27</sup>Javorcik 2004; Moran 2007. In theory, companies can also create "forward linkages" by providing low-cost inputs for other industries, which would make them more competitive. In practice, studies rarely find these linkages to have much effect.

<sup>28</sup>In fact, this is one reason why oil triumphed over coal in the 1950s as the world's leading source of fuel. Since coal production was labor intensive, it was more susceptible to labor strikes and hence supply disruptions. Strikes among coal miners in the United States and Europe in the early postwar period encouraged many businesses to switch from coal to petroleum, which required fewer workers and was less vulnerable to strikes. See Yergin 1991, 543–45.

<sup>29</sup>International Labor Organization 2005.

<sup>30</sup>Williams 2006.

<sup>31</sup>Schultz 2006.

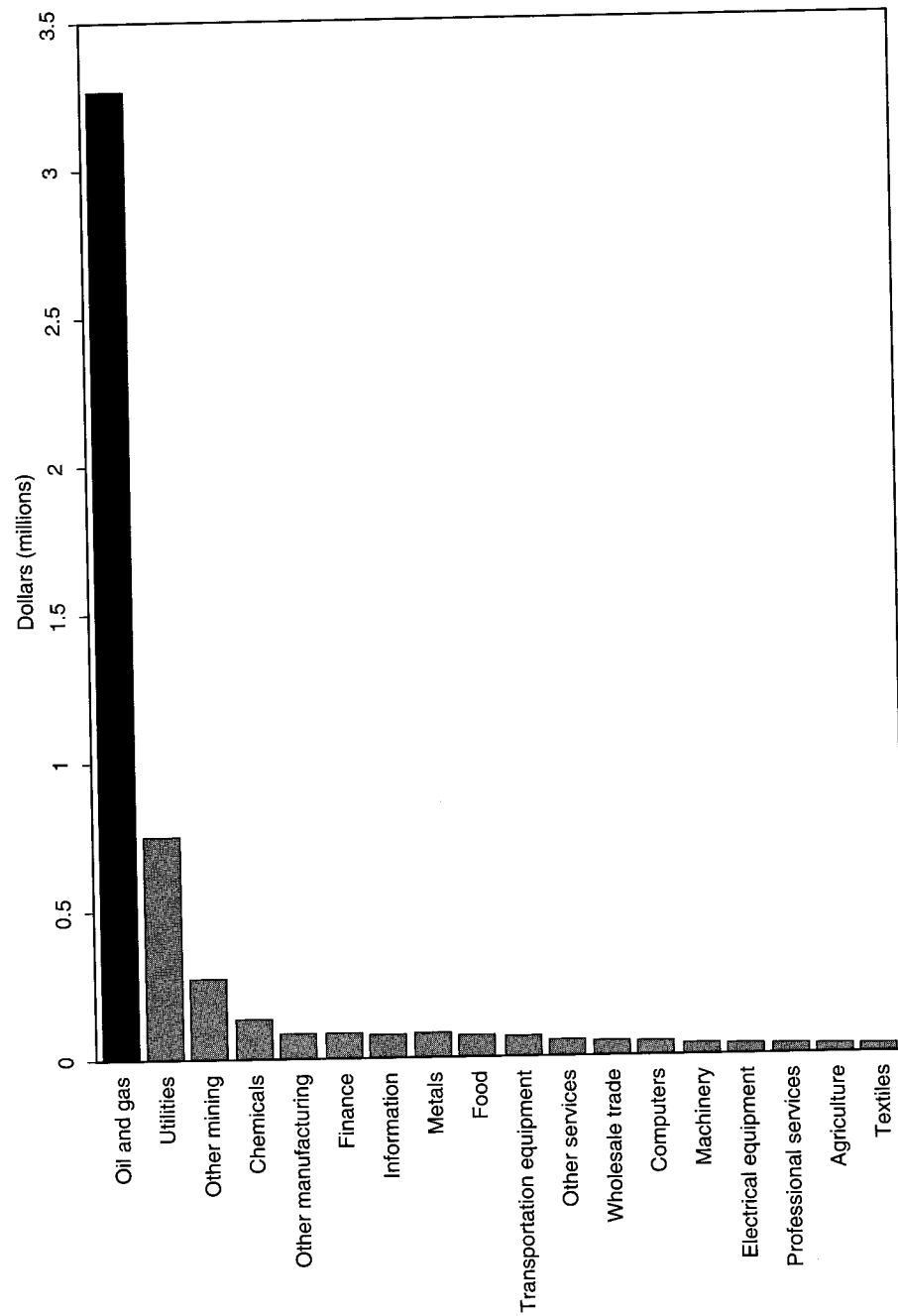


Figure 2.7. Capital-to-labor ratios in major industries. These bars show the amount of money (in million US\$) invested per employee by US businesses operating overseas. Source: Schultz 2006.

many companies, their main local “purchase” is the right to extract oil, which they buy directly from the government.

Thanks to these two qualities, oil production—and by extension, oil companies—can have a surprisingly small impact on the private sector, particularly in low-income countries. In the Republic of Congo, for instance, oil production has long accounted for about one-third of the economy. Yet a recent IMF study found that between 1960 and 2004, oil production had no direct impact on the growth of the non-oil economy.<sup>32</sup>

In his book *Crude World*, journalist Peter Maass describes his visit to a \$1.5 billion natural gas facility in Equatorial Guinea that was built and operated by Houston-based Marathon Oil, and almost entirely staffed by foreign workers:

The plant—like many oil installations in the developing world—could have been on the moon for all the benefit it offered local businesses. . . . Instead of buying cement from a Malabo company that might not deliver on time, Marathon built a small cement factory on the construction site. Raw materials were imported, and the factory would be dismantled when construction ended. The trailers in which (foreign workers) lived were prefab units—no local materials or local labor had been used to build them. The plant had its own satellite phone network, which was connected to the company’s Texas network—if you picked up a phone you would be in the Houston area code, and dialing a number in Malabo would be an international call. The facility also had its own power plant and water-purification and sewage system. It existed off the local grid.<sup>33</sup>

Finally, oil often fails to boost private-sector growth due to the “Dutch Disease.” The *Economist* magazine coined the term in November 1977 to describe the effect of natural gas exports on the Dutch economy. But the underlying syndrome was first noticed in the nineteenth century following the California gold rush of 1849 and the Australian gold rush of 1851.

William Newmarch, a banker (and ironically, an occasional writer for the *Economist*) argued that these gold-mining booms would stimulate other sectors of the US and Australian economies. But Irish economist John Elliot Cairnes made a surprising prediction: that a gold rush would not merely fail to stimulate the rest of the economy, as we might surmise from the enclave effect, but rather would *harm* other businesses by causing a drop in production. Cairnes’s contention turned out to be

<sup>32</sup>Bhattacharya and Ghura 2006.

<sup>33</sup>Maass 2009, 35–36.

right, providing economists with some of their earliest insights into the Dutch Disease.<sup>34</sup>

Journalists sometimes use the terms Dutch Disease and “Resource Curse” interchangeably, to refer to all hardships that can be linked to resource exports. For economists, the term Dutch Disease has a narrower definition: it is the process that causes a boom in a country’s natural resource sector to produce a decline in its manufacturing and agricultural sectors.

This decline is the result of two effects. The first is the “resource movement effect”: as the resource sector booms, it draws labor and capital away from the agricultural and manufacturing sectors and raises their production costs. The second is the “spending effect”: as money from the booming resource sector enters the economy, it raises the real exchange rate. A higher real exchange rate makes it cheaper to import agricultural and manufactured goods than to produce them domestically.

As a result, the manufacturing and agricultural sectors may lose a share of the domestic market, thanks to competition from cheaper imports, and they will find it harder to compete on world markets, thanks to higher production costs and the higher real exchange rate. Goods and services that cannot be imported (i.e., “nontradable goods,” like construction, security, and education) are protected from these effects, and suffer no harm. A boom in resource exports therefore will lead to a drop in the relative size of the agricultural and manufacturing sectors, other things being equal.<sup>35</sup>

There is little doubt that the Dutch Disease is real. After the booms of the 1970s, the Dutch Disease hurt the agricultural and manufacturing sectors of many oil-exporting countries, including Algeria, Colombia, Ecuador, Nigeria, Trinidad, and Venezuela.<sup>36</sup> In Nigeria, the Dutch Disease caused the value of agricultural production to fall from the early 1970s to the mid-1980s, and it devastated industries built on the export of cocoa, palm oil, and rubber.<sup>37</sup> In Algeria, booming oil exports led to a drop in manufactured exports twice—first in the late 1970s, and again in the late 1990s and early 2000s.

From a purely economic perspective, the Dutch Disease is not as grave as its name implies. According to the theory of comparative advantage, a rise in oil and gas exports *should* crowd out other types of exports, since it connotes a shift in a country’s comparative advantage.

<sup>34</sup>Bordo 1975.

<sup>35</sup>Corden and Neary 1982; Neary and van Wijnbergen 1986.

<sup>36</sup>Gelb and Associates 1988; Auty 1990.

<sup>37</sup>Bevan, Collier, and Gunning 1999.

If the income generated by the oil sector is greater than the income lost in manufacturing and agriculture—which should be true, according to simple economic models—the country should still be better off.<sup>38</sup>

The Dutch Disease can nonetheless be harmful if oil production has negative spillovers, or agriculture and manufacturing have positive spillovers, that might not show up in a simple economic analysis. If so, then a country with a larger oil sector along with a smaller agricultural or manufacturing sector might suffer in other ways—for example, by having more economic volatility, less democracy, fewer opportunities for women, and more violent conflict. Once these problems are factored in, the Dutch Disease becomes much more worrisome.

For the moment, though, notice how the Dutch Disease affects the size of the government as a fraction of the economy: since oil sectors are generally owned by governments, oil wealth expands the government; since agricultural and manufacturing sectors are typically in private hands, their declining profitability will reduce the size of the private sector. The Dutch Disease helps shift the country’s economic activities from the private sector to the government.

What about the other major sector of the economy—the service sector? During oil booms, a country’s service sector tends to thrive. Since it provides the economy with things that cannot be easily imported—like construction services, health care, and retail stores—the service sector should be unharmed by a rise in the exchange rate. In countries with exceptional oil wealth, most of the private sector is typically made up of service companies. According to World Bank data for 1990—the most recent year with relatively complete data—in the OPEC countries, 56 percent of the workforce was employed by the service sector; outside the OPEC countries, the average was 40 percent.<sup>39</sup> In oil-producing countries, these service companies often depend on government contracts—for example, to build state-funded projects like roads, bridges, and hospitals, and provide services to the oil industry.

In short, the Dutch Disease tends to make some industries (agriculture and manufacturing) smaller and more dependent on government help, and others (services) larger, partly through government contracts. Together with the enclave effect, the Dutch Disease helps explain why oil wealth does surprisingly little to aid other parts of the economy, and why the surviving businesses become more reliant on the government.

<sup>38</sup>Matsen and Torvik 2005.

<sup>39</sup>World Bank 2004.

## THE STABILITY OF OIL REVENUES

The third feature of oil revenues is their instability: they can soar or plummet unexpectedly. This volatility is produced by a combination of three factors: changes in oil prices, changes in production rates, and the contracts between governments and oil companies, which can either smooth or heighten these fluctuations.

*Changing Prices*

In January 1861, scarcely a year after oil was discovered in Titusville, Pennsylvania, it sold for ten dollars a barrel; over the next twelve months the price dropped by 99 percent, to ten cents a barrel.<sup>40</sup> The price of oil has been oscillating ever since.

Much of this price volatility can be traced to a simple economic fact: in the short run, both the supply of and demand for petroleum are price inelastic. This means that neither suppliers nor consumers can quickly adjust to changes in prices by changing the amount of oil they supply or consume. When prices rise, for instance, it can take years for producers to extract more oil, since the up-front investments are so large and take many years to bear fruit.<sup>41</sup> It also takes months or years for consumers to reduce their fuel use—for example, by insulating their homes or buying more fuel-efficient vehicles.<sup>42</sup>

Thanks to these inelasticities, a minor change in supply or demand can have a major effect on prices. A small drop in the supply of oil—perhaps due to unexpected violence in Iraq, Libya, or Nigeria—can produce a spike in prices. Similarly, a modest rise in demand can cause prices to soar. Even the expectation of changes in supply and demand can cause prices to swing, thanks to the resulting purchases or sales by market speculators. The price of oil is more volatile than the price of 95 percent of all products sold in the United States.<sup>43</sup>

Oil markets have also had periods of stability. Figure 2.8 shows how the annual price of a barrel of oil, adjusted for inflation, changed between 1861 and 2009. During the industry's first century, prices gradually became steadier. The greatest stability occurred between 1935 and 1969, when the real price of oil rose or fell by an average of 5.9 percent

<sup>40</sup>Yergin 1991.

<sup>41</sup>If oil suppliers have unused production capacity, they can bring additional oil to the market more quickly. Even this can take months to accomplish, due to bottlenecks in refining and transportation.

<sup>42</sup>Smith 2009.

<sup>43</sup>See Kilian 2008; Regnier 2007.

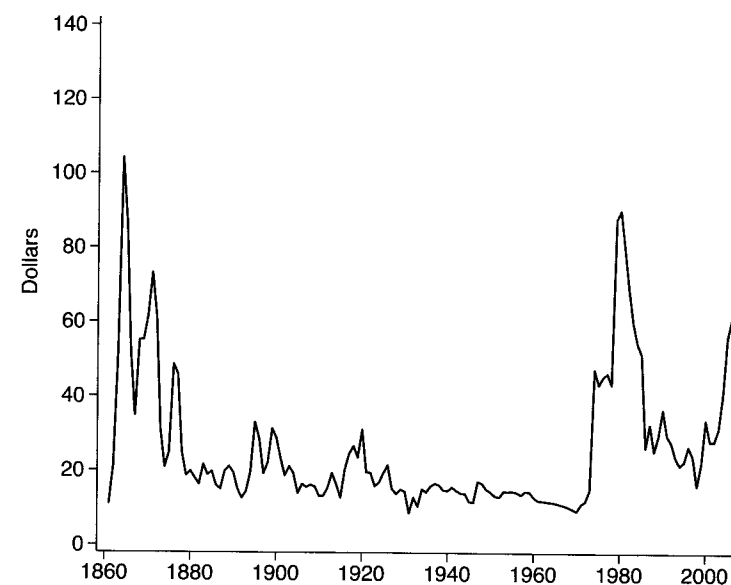


Figure 2.8. Price of a barrel of oil, 1861–2009

Oil prices are in constant 2005 dollars.

Source: BP 2010.

a year, and there was just one year (1947) when prices changed by more than 20 percent. But since 1970, the price of oil has changed by an *average* of 26.5 percent a year. Before the 1970s, no one bothered to forecast oil prices, since they changed so little; after 1973, oil price forecasting became a major enterprise, albeit one with a dismal track record.<sup>44</sup>

The return of price volatility around 1970 was the result of three factors.

The first was the wave of nationalizations that swept the oil-producing countries in the 1960s and 1970s. From the 1930s to the 1960s, the companies that dominated the international oil trade were able to keep global prices stable by boosting or cutting production to match changes in demand.<sup>45</sup> When there was a global oil glut in the 1960s, they limited production in the Persian Gulf, particularly in Iraq, and accepted lower profits to keep prices from collapsing. But the rising power of oil-producing governments in the 1960s and 1970s deprived these

<sup>44</sup>Some economists suggest that since 1973, oil prices approximate a “random walk”—meaning that the best predictor of next year’s price is this year’s price, but that even this prediction is spectacularly inaccurate. See Engel and Valdés 2000; Hamilton 2008.

<sup>45</sup>Levy 1982.

companies of their control over global petroleum supplies, and hence their ability to keep prices stable.

The nationalizations of the 1960s and 1970s caused the petroleum industry to become—for the first time in a century—less vertically integrated. The international companies that controlled global shipping and marketing no longer controlled production. The state-owned companies that now controlled production were free to sell their oil to the highest bidder, taking advantage of the new “spot market” that allowed investors to buy and sell individual oil shipments.<sup>46</sup> Since market forces instead of long-term contracts increasingly determined oil prices, prices could fluctuate freely to reflect shifts in supply and demand.

The second factor was the demise of the Bretton Woods system of fixed exchange rates. In the decades after World War II, the Bretton Woods system limited changes in the value of national currencies and hence helped dampen fluctuations in commodity prices, which were usually denominated in dollars. When the fixed exchange rate system broke down in 1971, the value of the dollar began to fluctuate. This made international commodity prices, which were denominated in dollars, much more erratic.<sup>47</sup>

Finally, the rise in volatility was the result of increasingly tight oil supplies. From the 1940s to the 1960s, the discovery of massive new oil fields—largely in the Middle East—allowed global production to grow as quickly as global consumption. But by 1970, the industry’s production capacity was expanding more slowly, even though the demand for oil continued to boom.

The position of the United States was especially influential. From the 1860s to the mid-1970s, the United States was both the world’s leading oil producer and its leading consumer.<sup>48</sup> But in October 1970, US production reached its historic peak and then began a steady decline; at the same time, US consumption continued to grow rapidly (see figure 2.9). US imports began to soar as a result, doubling from 1969 to 1973. Until 1970, the world had enough spare capacity to smoothly meet rising demand; after 1970, oil producers could no longer respond to rising demand by raising production, and instead raised prices.

All of these forces came together in 1973–74, when the real price of oil tripled. They doubled again in 1978–79. In the currency of the day, the price of oil rose from \$1.80 a barrel in 1970 to over \$36 a barrel in 1980.

<sup>46</sup>Leonardo Maugeri (2006) provides an especially good account of the emergence of the spot market.

<sup>47</sup>Cashin and McDermott 2002.

<sup>48</sup>Except for 1898 to 1901, when czarist Russia briefly outproduced the United States, according to Goldman 2008.

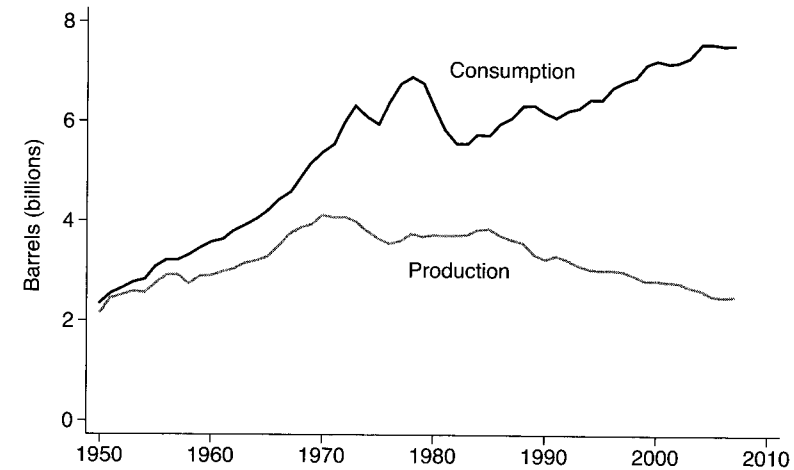


Figure 2.9. US petroleum production and consumption, 1947–2007

The lines show US consumption (upper line) and US production (lower line) in billions of barrels per year.

Source: Energy Information Administration, available at <http://www.eia.doe.gov> (accessed January 15, 2009).

According to contemporary observers, the 1973–74 oil shock was caused by the boycott organized by OPEC’s Arab members, in response to the Yom Kippur War between Israel and its neighbors. But this explanation was incomplete. Two earlier Arab boycotts—one after the 1956 Suez Crisis, and the other following the 1967 Six-Day War—had little impact on global prices. The 1973–74 Arab oil boycott was different because the international oil companies had lost their capacity to boost production in the fields they once controlled, and because the United States had lost its position as the world’s swing producer.<sup>49</sup>

In the 1970s, many policymakers believed that the world had entered a new era of chronically high oil prices. The 1972 Club of Rome report, *The Limits to Growth*, predicted that primary commodities would become increasingly scarce in the coming decades, giving the resource-rich countries a privileged slot in the international system.<sup>50</sup> According to economist John P. Lewis, the Club of Rome report “froze the attention of the public-affairs community of the world as nothing had before.” Old arguments offered by a handful of economists in the 1950s

<sup>49</sup>Tetreault 1985.

<sup>50</sup>Meadows et al. 1972.



and early 1960s about the disadvantages of mineral wealth were seemingly disproved.<sup>51</sup>

Yet what looked like a new era of high oil prices turned out to be a new era of price volatility. Prices shot up in the 1970s, but from 1980 to 1986 the real price of oil dropped by more than two-thirds, as Western countries reduced their consumption and the Saudi government boosted production.

From 1986 to 1999, oil prices were relatively stable once again. Some industry observers argued that the oil shocks of the 1970s and the crash of the early 1980s were aberrations. In 2000, two leading analysts wrote that “long-term trends point to a prolonged oil surplus and low oil prices over the next two decades.”<sup>52</sup> In the new millennium, though, oil prices boomed once more, rising from below \$10 a barrel in January 1999 to over \$145 a barrel in July 2008, before collapsing to less than \$40 a barrel just five months later.<sup>53</sup>

### Changing Production

A nation’s oil revenues can also fluctuate due to changes in production. For example, when a country begins to extract oil or gas, rising production can lead to a flood of new revenues—which can overwhelm the government’s capacity to use them wisely, as chapter 6 will point out.

Of course, production can also fall. Since countries have a limited stock of petroleum reserves, in the long run the number of barrels they pump from the ground will decline. Not every petroleum-rich country needs to worry about running out of oil in the foreseeable future. Those with the largest reserves, including Saudi Arabia, Kuwait, Iraq, and Iran, have enough to maintain their production levels for many decades, perhaps even centuries (see figure 2.10). But most oil-producing countries have smaller reserves, whose depletion could lead to falling incomes. Countries whose incomes are already low and that are dependent on revenue from their petroleum sectors face the greatest dangers. Several major oil and gas producers, including Indonesia, Ecuador, and Gabon, depleted most of their petroleum reserves in the 1980s and 1990s, although each enjoyed a reprieve due to subsequent discoveries. Other countries, like Syria, Bahrain, and Yemen, are expected to run out of petroleum in the near future.

<sup>51</sup>Lewis 1974, 69. See, for example, Prebisch 1950; Singer 1950; Nurske 1958; Levin 1960; Hirschman 1958. These and other studies are reviewed in Ross 1999.

<sup>52</sup>Jaffee and Manning 2000.

<sup>53</sup>These are spot market prices for Brent crude in current dollars, according to data posted on the Energy Information Administration Web site, available at <http://www.eia.doe.gov> (accessed April 13, 2010).

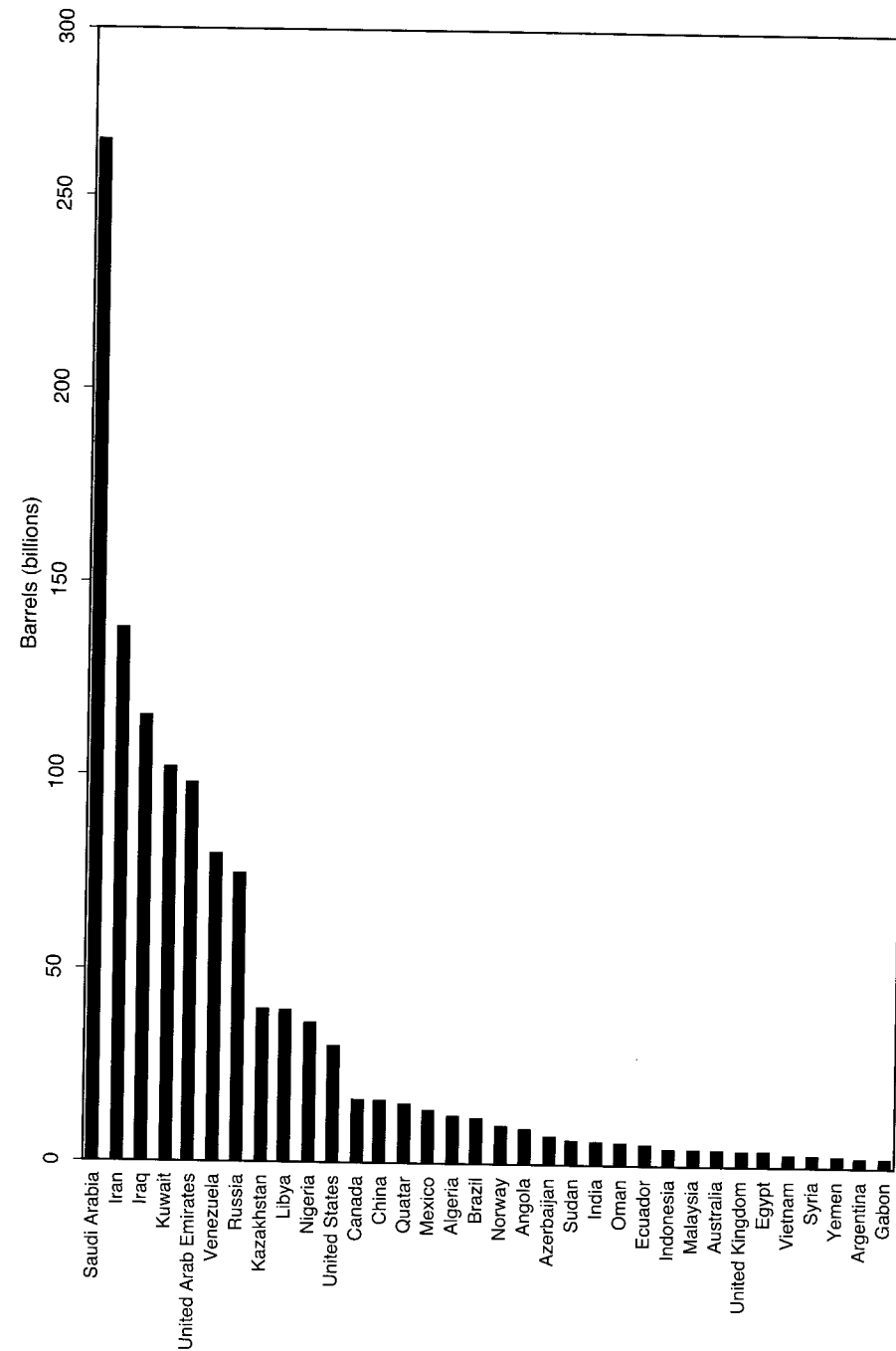


Figure 2.10. Proved oil reserves, 2005

These bars represent proved oil reserves, in billions of barrels; natural gas is not included.  
Source: BP 2010.



In one way, changes in oil production are less worrisome than changes in prices, since they can be anticipated years in advance and do not cause the same level of uncertainty. But in another way they are more worrisome, because they create an additional problem for governments—the problem of compensating for the depletion of the country's mineral assets.

Countries whose income comes from depleting their natural resources are undergoing a fundamentally different process than those whose income comes from the production of goods and services. To better understand these differences, it is helpful to distinguish between income and wealth. An individual's income is their salary, while their wealth is the money they have saved. A country's income is the total value of the goods and services that it produces in a given year, while its wealth is its accumulated assets.

All countries have four types of wealth: physical capital, which includes roads, buildings, and other infrastructure; human capital, meaning the size, quality, and education of the labor force; social capital, which consists of the country's shared values, norms, and civic organizations; and natural capital, which is made up of its land, forests, and minerals.<sup>54</sup> Physical, human, and social capital all are renewable resources. If properly nurtured, they can generate income indefinitely.

Income from oil, however, comes almost entirely from a country's natural capital.<sup>55</sup> Some types of natural capital, like soil and forests, can be sustained indefinitely when properly maintained. Yet oil is a limited resource, and once exploited, cannot be regenerated. It is a nonrenewable form of wealth. When a country extracts and sells its oil, it is reducing its total stock of natural capital. Unless it replaces these assets with other forms of capital, such as roads and schools, the depletion of its oil will lead to a drop in the country's income.

### *Destabilizing Contracts*

Changes in prices and production can partly explain why oil revenues are unstable, but the contracts that governments sign with oil companies also play a role. Contracts determine how much of the money generated by oil sales will go to the government, and how much to the private companies that help them extract, refine, and ship their petroleum.

<sup>54</sup>These categories roughly correspond to the classic division of factors of production into "land" (natural resources), "labor" (human and social capital), and "capital" (physical capital).

<sup>55</sup>Strictly speaking, the money earned from the sale of minerals should not even be classified as income but rather as revenues from the sale of assets. For an insightful analysis of this issue and how it often leads to confusion, see Heal 2007.

These contracts can either smooth out or aggravate the volatility caused by changing prices and production rates.<sup>56</sup>

To understand why these contracts matter, it is useful to think of the price of oil as having both fixed and variable components. Imagine that the price of oil fluctuates over time between \$20 and \$120 a barrel, with an average price of \$70. The fixed component of the price is \$20—since the price never falls below this point—while the variable component ranges from zero to \$100, with an average value of \$50.

If a contract divides the income from an oil well into these two components, whatever entity receives the fixed component will experience none of the price volatility, and whatever entity receives the variable component will experience all of it. In fact, the holder of the variable component will experience even more volatility than changes in the price would suggest. While the overall price of oil varies by a factor of six (from \$20 to \$120), the variable component might vary by a factor of one hundred (from \$1 to \$100). In the long run, the variable component generates more income than the fixed one, since its average value is \$50, but coping with this volatility can be costly.

Until the 1950s, oil contracts gave governments a more or less fixed portion of the oil revenues, and the international companies a larger but more variable portion. While companies gained most of the benefits from oil extraction, they also incurred most of the risks, including that of price fluctuations. For example, a 1948 contract between Getty Oil and the Saudi Arabian government gave the government a fixed royalty of fifty-five cents a barrel, regardless of the world price—which at the time was about two dollars a barrel.<sup>57</sup> The Saudi government gained a steady and predictable income, but missed out on large windfall profits when prices were high. Getty sometimes gained large windfall profits, but also bore the risks of price fluctuations. This was one reason that the major companies worked so hard to stabilize prices by boosting or cutting production: because they bore most of the costs of price volatility.

When governments nationalized their oil sectors in the 1960s and 1970s, the terms of these contracts were largely reversed. Today foreign companies receive a relatively fixed part of the oil profits, while governments collect a larger, but more variable part. One study of an Angolan oil contract showed that a 50 percent rise in the price of oil would lead to an 82 percent increase in government revenues, but only

<sup>56</sup>These contracts are part of country's overall tax regime—the mix of taxes, royalties, and other fees that the government uses to collect revenues. The tax regime also affects the stability of government revenues: property taxes along with unit or ad valorem taxes produce a relatively steady stream of revenues; profit and income taxes create a more volatile flow of revenues (Barma, Kaiser, Le, and Viñeula 2011).

<sup>57</sup>Yergin 1991.

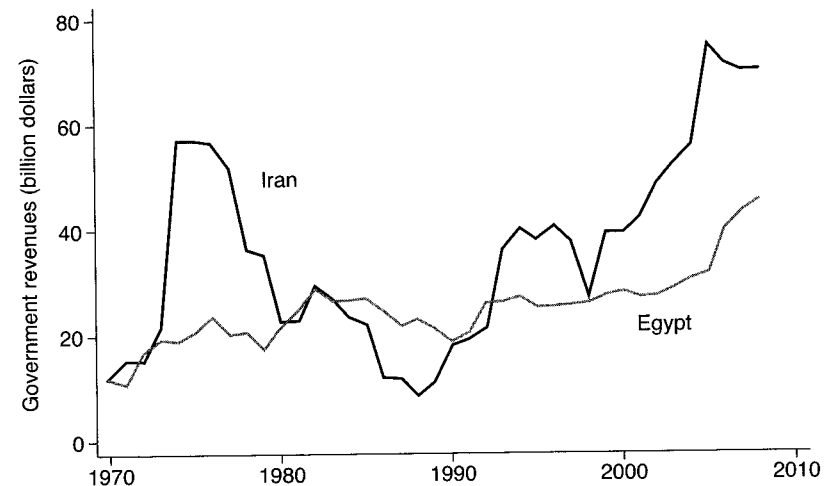


Figure 2.11. Government revenues in Iran and Egypt, 1970–2009

Sources: Central Bank of Egypt, annual reports; Central Bank of Iran, annual reports.

a 9 percent rise in revenues for the international oil company; a drop in oil prices would also produce an exaggerated fall in government revenues.<sup>58</sup> When the market booms, governments benefit disproportionately; when it collapses, they also lose disproportionately.<sup>59</sup>

Contracts affect revenue stability in other ways too. When a contract is finalized, governments frequently receive an immediate “signing bonus,” which acts as a onetime windfall. Companies recoup the cost of these bonuses and other early investments by paying lower taxes or royalties during the early years of production. After receiving a signing bonus, a government thus may collect little oil income for the next few years—causing a boom and bust in government revenues, even if prices and production levels are steady.

Governments have little control over oil prices, but they have a lot of control over contracts. Yet instead of designing contracts that stabilize their revenues, most governments now sign contracts that seem to further destabilize their revenues.

Together these three features—changing prices, changing production, and destabilizing contracts—make the budgets of oil states un-

<sup>58</sup>Shaxson 2005.

<sup>59</sup>Michael Shafer (1983) made this point long ago, in analyzing the disastrous consequences for both Zambia and the Democratic Republic of Congo of nationalizing their copper industries.

usually volatile. Figure 2.11 compares government revenues in oil-rich Iran to oil-poor Egypt. In 1970, their governments each collected about \$12 billion in revenues (in constant 2009 dollars). Since then, Iran’s revenues have grown faster, but have also been more volatile—more than tripling from 1972 to 1974, falling by more than 80 percent from 1974 to 1988, then rising quickly but erratically from 1988 to 2005. Egypt’s revenues have also grown, but more slowly and smoothly.

#### THE SECRECY OF OIL REVENUES

Oil revenues are unusually easy for governments to conceal. Many democracies make their oil revenues known to the public: Brazil, New Zealand, Norway, and the US state of Alaska are models of revenue transparency.<sup>60</sup> But most undemocratic oil producers, and some partially democratic ones like Iran and Venezuela, take advantage of the slippery nature of oil revenues to keep them out of the public view. One analysis found that “secrecy in the extractive industries is so commonplace that until recently, neither states nor companies have felt compelled to develop sophisticated arguments to defend it.”<sup>61</sup>

Secrecy is intrinsically hard to measure. There is no easy way to document how much money a government is concealing from the public. Still, many country-level studies show that the finances of resource-rich countries are unusually opaque.<sup>62</sup> A recent analysis of Cameroon, for example, found that just 46 percent of its oil revenues between 1977 and 2006 were transferred to the budget; the remaining 54 percent could not be accounted for.<sup>63</sup> A 2010 survey of budget policies in ninety-four countries around the world found that the national budgets of hydrocarbon-dependent countries were dramatically less transparent than those of other countries.<sup>64</sup>

The exceptional secrecy of the oil states can be traced in part to their use of unreported off-budget accounts. Oil-funded governments often use these accounts to keep a large fraction of their spending off the

<sup>60</sup>See Revenue Watch Institute 2010.

<sup>61</sup>Rosenblum and Maples 2009, 12.

<sup>62</sup>On the secrecy and misuse of petroleum revenues in Angola, Cambodia, Congo-Brazzaville, Equatorial Guinea, Kazakhstan, and Turkmenistan, see reports by Global Witness, a London-based NGO, available at <http://www.globalwitness.org>. On similar problems in Chad and Nigeria, see reports by another NGO, Publish What You Pay, available at <http://www.publishwhatyoupay.org>.

<sup>63</sup>Gauthier and Zeufack 2009.

<sup>64</sup>International Budget Partnership 2008. I describe this survey more fully in chapter 3.

books, sometimes hidden in the crevices of national oil companies, whose finances are withheld from public scrutiny. For instance:

- Before he was overthrown in 1998, Indonesia's President Suharto used the national oil company, Pertamina, to covertly distribute benefits to his supporters. At its height, Pertamina controlled about one-third of the government's budget and was shielded from public disclosure.<sup>65</sup>
- During Saddam Hussein's rule, more than half of Iraq's national budget was funneled through the Iraqi National Oil Company, whose budget was secret.<sup>66</sup>
- In Azerbaijan, about half of the government's budget runs through the national oil company, known as SOCAR. The actual sum, once again, is secret.
- A large fraction of the Angolan government's budget goes through Sonangol, its national oil company. The amount has never been publicly disclosed, but a 1995 IMF analysis suggested it was about 40 percent of total government spending.<sup>67</sup>
- Mexico's ruling party from 1929 to 2000, the Institutional Revolutionary Party (PRI), relied heavily on funding from the national oil company, Petróleos Mexicanos (PEMEX).<sup>68</sup> During the 2000 elections, PEMEX reportedly funneled more than a hundred million dollars to the PRI reelection campaign through the oil workers' union.<sup>69</sup> The election was preceded by a sudden increase in PEMEX's discretionary disbursements to "civic associations, schools, foundations, agricultural communities, fishing cooperatives, unions, and municipal governments" in politically important regions.<sup>70</sup>
- When Libya's civil war broke out in early 2011, Colonel Muammar Qaddafi survived international sanctions by using "tens of billions" in cash that had been secretly hidden in Tripoli to fund loyalists and hire mercenaries. According to the *New York Times*, intelligence officials said it was hard to distinguish between the assets of the Libyan government, including its sovereign wealth fund, and the Qaddafi family's assets.<sup>71</sup>

<sup>65</sup>Crouch 1978.

<sup>66</sup>Alnasrawi 1994.

<sup>67</sup>Human Rights Watch 2004.

<sup>68</sup>Ascher 1999; Greene 2010.

<sup>69</sup>Schroeder 2002.

<sup>70</sup>Even after Mexico's transition to democracy in 2000, PEMEX donations have risen sharply in election years (Moreno 2007).

<sup>71</sup>Risen and Lichtblau 2011.

While the most egregious examples of off-budget financing come from authoritarian governments, the same syndrome can occur in partially democratic states. The Iranian government transfers oil profits to politically powerful figures through *bonyads*—semipublic enterprises that are nominally outside the government's purview and shielded from public disclosures.<sup>72</sup>

The example of Venezuela is even more telling. In the 1980s and 1990s, Venezuela's Petróleos de Venezuela S.A. (widely known by its acronym, PDVSA), was one of the world's most politically independent and well-managed national oil companies. In the early 2000s, President Hugo Chávez stripped PDVSA of its independent authority and replaced its top officials with loyal followers. He then placed PDVSA in charge of administering a new set of social programs, closely tied to his political machine. By 2004, two-thirds of PDVSA's budget went to social programs, not petroleum-related activities. As its social programs grew, PDVSA's transparency fell. After 2003, its financial disclosures dropped sharply, and independent observers found its activities increasingly difficult to monitor.<sup>73</sup>

The NOCs of Western democracies can be equally corrupt. In the mid-1990s, a series of audits revealed that France's national oil company, Elf Aquitaine, had been an important source of campaign financing for political parties, especially the Gaullist Rally for the Republic. John Heilbrunn notes that

prosecutors uncovered evidence that a few managers at Elf had embezzled approximately 400 million Euros that they used to finance campaigns, bribe foreign politicians, and enrich themselves. In 2003 trials began for thirty-seven people implicated in the scandal. The scandal embroiled several former ministers and the French constitutional council's president, as well as former German president Helmut Kohl, Gabonese president Omar Bongo, and Congolese president Denis Sassou-Nguesso.<sup>74</sup>

Two of the industry's features, discussed above, help explain why oil revenues are so easy to conceal. Since oil reserves are state-owned property, companies can only gain access to them by negotiating detailed contracts with the government, often through national oil companies. These contracts are notoriously complex, but ultimately determine how much companies will pay.<sup>75</sup> Since the terms of these contracts are

<sup>72</sup>Brumberg and Ahram 2007; Mahdavi 2011.

<sup>73</sup>Mares and Altamirano 2007; International Crisis Group 2007.

<sup>74</sup>Heilbrunn 2005, 277.

<sup>75</sup>Johnston 2007; Radon 2007.

typically secret, it is nearly impossible for observers to know the size of these payments. Even though international companies could disclose the payments they make to governments, they rarely do so.<sup>76</sup> If oil reserves were not state owned, these negotiations would be unnecessary: companies would be able to buy oil rights the same way they buy land rights, and oil companies would be subject to the same tax laws as other companies.

The other feature is the prevalence of national oil companies, which have dominated the industry since the 1970s. State-owned enterprises of all kinds—in agriculture, manufacturing, and services—were far more common until the 1980s. In the 1980s and 1990s, however, most countries privatized a large fraction of their state-owned companies, which were widely seen as inefficient, corrupt, and a drain on government resources. In low-income states, the fraction of total employment accounted for by state-owned enterprises dropped from 20 percent in 1980 to 9 percent in 1997; it fell from 13 to 2 percent in middle-income countries.<sup>77</sup>

Yet in the oil business, there has been little movement toward privatization. In fact, high oil prices in the 2000s led to new nationalizations in Venezuela, Bolivia, Ecuador, and Russia.<sup>78</sup> In many undemocratic countries, NOC budgets are exempt from parliamentary oversight. The parliament's role in undemocratic states is of course already limited. Still, most authoritarian governments submit regular budget statements to their parliaments and the public; the budgets of NOCs are nevertheless typically excluded or summarized so tersely that little is revealed about their finances.

If benevolent accountants ran governments, the unusual qualities of oil revenues might not matter. But governments are ruled by self-interested politicians, who are deeply influenced by the kinds of funds at their disposal. States whose revenues are massive, unstable, opaque, and do not come from taxes, tend to have some strange qualities.

<sup>76</sup>Transparency International 2008.

<sup>77</sup>Guriev and Megginson 2007.

<sup>78</sup>Guriev, Kolotilin, and Sonin 2010; Duncan 2006; Kretschmar, Kirchner, and Sharifzyanova 2010.

## CHAPTER THREE

### More Petroleum, Less Democracy

The problem is that the good Lord didn't see fit to put oil and gas reserves where there are democratic governments.

—former vice president Dick Cheney, 2000

IN JANUARY 2011, prodemocracy protests broke out across the Middle East. For decades, the Middle East has had less democracy, and more oil, than any other world region. This is no coincidence: oil-funded rulers have long used their petrodollars to entrench themselves in power and block democratic reforms. Although protesters took to the streets in almost every Arab country, they found it much easier to overthrow rulers in oil-poor countries, like Tunisia and Egypt, than rulers in oil-rich states, like Libya, Bahrain, Algeria, and Saudi Arabia.

Oil has not always been an impediment to democracy. Until the 1970s, oil producers were just as democratic—or undemocratic—as other countries. But from the late 1970s to the late 1990s, a wave of democracy swept across the globe, bringing freedom to countries in virtually every region—except the petroleum-rich countries of the Middle East, Africa, and the former Soviet Union. From 1980 to 2011, the democracy gap between the oil and non-oil states grew ever wider.

This chapter explains how oil has kept autocrats in power by enabling them to increase spending, reduce taxes, buy the loyalty of the armed forces, and conceal their own corruption and incompetence. Petroleum does not *inevitably* block democratic freedoms: a handful of oil-rich developing countries have still made transitions to democracy—most recently, Mexico and Nigeria. Yet among the oil states—both in the Middle East and beyond—transitions to democracy have been exceedingly rare. Oil and democracy do not easily mix.<sup>1</sup>

<sup>1</sup>Students of Middle Eastern politics have long been familiar with oil's corrosive effects on government accountability. Important studies of oil and authoritarian rule in the Middle East include Mahdavy 1970; Entelis 1976; First 1980; Skocpol 1982; Beblawi and Luciani 1987; Crystal 1990; Brand 1992; Anderson 1995; Gause 1995; Chaudhry 1997; Vandewalle 1998; Okruhlik 1999; Herb 1999; Lowi 2009. Yet for many years, the largest and most influential studies of global democracy said little about oil, and often avoided the Middle East entirely. See, for example, O'Donnell, Schmitter, and Whitehead 1986; Diamond, Linz, and Lipset 1988; Inglehart 1997; Przeworski et al. 2000.