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## Fiscal Systems for Oil

The government “take” and competition for exploration investment

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Until the 1960s, petroleum exploration on an international scale was carried out by only a few large petroleum corporations. But in the past few decades, the number of oil companies has increased substantially. Now, more than 300 oil companies explore in two or more countries, and exploration by private companies takes place in more than 150 countries.

Exploration for petroleum occurs on the basis of concessions, leases, or contracts granted by

governments. The terms and conditions of such arrangements are established by law or negotiated case by case. One important aspect of the arrangements is the fiscal terms and conditions—these include bonuses, rentals, royalties, production sharing arrangements, carried interest provisions, corporate income taxes, and special taxes.<sup>1</sup> Together, all the payments to government required under a petroleum arrangement can be called a “fiscal system.” In some countries, a single fiscal system applies to the entire country; in others, a variety of fiscal systems exist.

The large number of governments involved in setting terms and conditions for fiscal systems, the wide diversity of areas available, and the large number of oil companies interested in exploration have created an “international market” for exploration acreage. Governments offer exploration acreage through formal bidding rounds or case by case. The “price” for the acreage is the government take—the total effect of the fiscal system on the cash flow of an oil field—and is expressed as a percentage. For example, a government take of 55 percent means that the total government revenues resulting from the fiscal system represent 55 percent of the cash flow from the oil field. The world average government take is 64 percent. Ireland has a very low government take, at 25 percent, and Yemen a very high one, at 95 percent. Most government takes are between 40 percent and 85 percent.

How governments compete for exploration and development investments by private oil companies is still poorly understood—by governments and by companies. This Note analyzes the process of competition among governments.

### BOX 1 FISCAL SYSTEM RATINGS IN OIL-PRODUCING AREAS

*Very favorable:* Ireland, Spain, United Kingdom, Argentina, New Zealand, Pakistan (zone 1), and Denmark (fourth round).

*Favorable:* Northwest Territories (Canada), Illinois, Peru, Australia (offshore), and U.S. outer continental shelf (Gulf of Mexico, deep).

*Average:* The Philippines, U.S. outer continental shelf (Gulf of Mexico, shallow), Thailand (gulf, 1995 terms), China (offshore), Malaysia (deep water), Nigeria (offshore to 200 meters), Viet Nam, and Trinidad and Tobago (onshore).

*Tough:* Kazakhstan, Alaska (onshore), Ecuador (regular terms), Texas (offshore), Alberta (third-tier oil), Netherlands (1995 terms), Norway, and India.

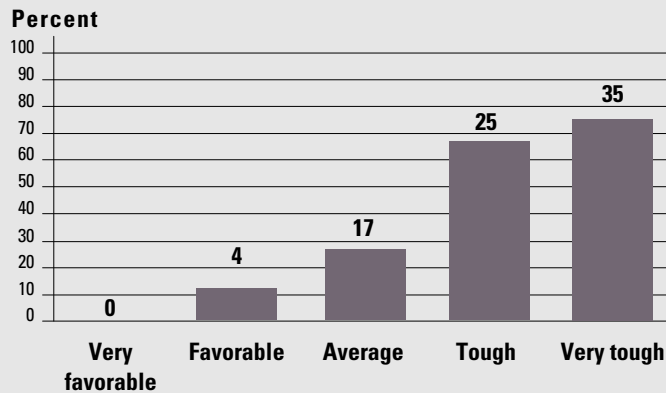
*Very tough:* Louisiana, Russia (production sharing contract), Venezuela (new model contract), Indonesia (1994 terms), Malaysia (conventional), Angola, Nigeria (Niger Delta), Syria, and Yemen.

*Note:* This is not an exhaustive list of the results.





**FIGURE 1 EXPORTING AREAS AS A SHARE OF EACH FISCAL SYSTEM GROUP**



### Fiscal system ratings

In a study initiated and supported by the World Bank and private oil companies, 226 fiscal systems in 144 countries were rated on the basis of a standard economic analysis of oil fields assuming the same prices and costs across the world. The oil fields ranged in size from 3 million to 300 million barrels. The rating is based on eight different economic yardsticks, including such familiar economic indicators as rate of return and net present value, the government take, and the geological risk in exploring for oil and gas fields.

A point system based on the eight criteria was developed that simulates an investor's decision-making. Using this point system, the fiscal systems were divided into five groups, ranging from "very favorable" (the best systems for investors) to "very tough" systems (box 1).

In a competitive world, areas with the least favorable geology, the highest costs, and the lowest wellhead prices would be expected to offer the best fiscal terms—and areas with the best geology, the lowest costs, and the highest wellhead prices the toughest terms. That pattern of competition does in fact exist. Countries with unfavorable conditions typically offer very favorable or favorable terms, and countries with

favorable conditions, such as the oil-exporting countries, demand tough or very tough terms (figure 1). Provinces and states also follow that pattern: the exporting states of Louisiana and Texas set tough or very tough terms, and the importing province of Ontario offers favorable terms.

The study found that the correlation between fiscal terms and geological and economic conditions is much stronger at the regional level than at the global level. Thus, while companies compete globally, governments seem to compete regionally.

Governments respond to market forces in setting terms and conditions for their acreage. But they set these terms and conditions primarily in reference to the region. In other words, governments in the Asia-Pacific region tend to compete with other governments in that region rather than with governments in Europe or Latin America. There are two reasons for this behavior. First, some governments, particularly those of smaller countries, have limited information about fiscal terms and conditions around the world, but usually have better knowledge of the terms in neighboring countries. Second, it is often difficult for governments to defend terms and conditions significantly more favorable to foreign oil companies than those set by their neighbors. A good political defense for the terms of a contract is that they are similar to those of contracts in surrounding countries. This behavior by most governments leads to a regionalization of fiscal systems, creating important anomalies.

### Anomalies created by government behavior

The first anomaly is that regions seem to "disconnect" from other regions. The government take for most fiscal systems in Europe ranges from about 35 percent to 65 percent—though a few outlier values stretch the actual range for the region from 18 percent to just over 80 percent (figure 2). In Sub-Saharan Africa, North America, and the Asia-Pacific region, government takes typically range from roughly 40 percent to 80 percent. In the central region, which

includes North Africa, the Middle East, and the countries of the former Soviet Union, government takes are 60 percent to 95 percent. Countries in each region seem to compete within that region's range of government takes. Latin America is the only region in which countries compete more or less globally, setting government takes that range over the entire spectrum—from 25 percent to 90 percent.

North America does not seem globally competitive. To compete with Europe and Latin America, several importing areas in North America should offer very favorable terms. Yet none of the importing states and provinces of the United States and Canada offers very favorable terms—remarkable, because the United States is an important oil importer.

The second anomaly has to do with importing countries with modest geological prospects. These countries need to adopt very favorable or favorable terms to be globally competitive. Yet, driven by regional concepts of competition, many of these countries offer rather tough fiscal terms. Consequently, there are countries that are regionally, but not globally, competitive, including the Republic of Korea, Nepal, Lao People's Democratic Republic, Bangladesh, India, Papua New Guinea, Tanzania, Mozambique, Ghana, South Africa, Albania (offshore), Morocco, Romania, Jordan, and Mauritania.

**The average fiscal system is regressive and front-end-loaded**

To examine the global characteristics of fiscal systems, the study determined a “world average fiscal system” by calculating the arithmetic average of all 226 fiscal systems. This calculation produced some interesting results.

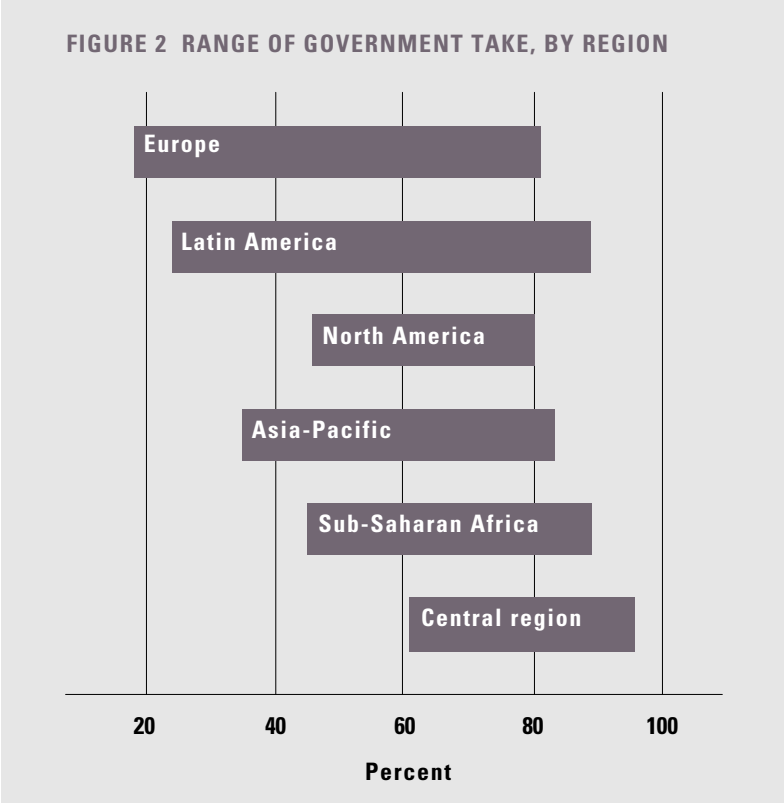
**1. The world average fiscal system is regressive for small fields.**

*Regressive* means that the government take is a higher percentage of the cash flow for small and marginal fields than for large and profitable fields. The average government take on a 10 million barrel field is 68 percent and on a 300

million barrel field 64 percent. As a result, the rate of return of a 10 million barrel field declines significantly when the government take is taken into account. Most fiscal systems make small but potentially profitable fields uneconomic. Oil-producing and oil-exporting countries set fiscal terms so as to capture the biggest rent possible from large oil finds and may neglect to promote private investment on small marginal fields. But oil-importing and self-sufficient countries need more oil and thus have an incentive to ensure that private investment also reaches small marginal fields. World oil production could be significantly increased if governments of oil-importing and self-sufficient countries and provinces provided fiscal incentives for production on small fields.

**2. The world average fiscal system is front-end-loaded.**

On a standard 30 million barrel field, the government take is 68 percent during the first six





**TABLE 1 GOVERNMENT TAKE IN ONSHORE AND DEEP WATER CONDITIONS (percent)**

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

years of production and 61 percent during the rest of production. Adopting back-end-loaded systems could significantly increase the attractiveness of exploration and development.

**Trends point to lower government take and greater differentiation in terms**

Over the past decade, fiscal terms and conditions have changed significantly. Of the 226 fiscal systems analyzed, 130 have been changed. In almost all these systems, the changes reduced the government take. At the same time, the supply of exploration acreage has increased. Many countries have opened new areas, including China (onshore), Viet Nam, Cuba, Myanmar, Yemen, the countries of Eastern Europe and the former Soviet Union, and, recently, Venezuela. Many other countries have decided to accelerate the process of offering acreage, such as Argentina and Peru. These changes have almost doubled the acreage available for exploration by private oil companies during the past ten years.

At the same time, the demand for acreage has fallen because of lower oil prices and smaller cash flows for the oil industry. As a result, the “price” for acreage—the government take—has been declining. This trend can be expected to continue until a new balance is established between supply and demand for acreage.

Another important development is the increased differentiation of terms within countries. Many

countries have begun differentiating terms more to reflect differences among areas in such factors as costs, geology, logistical conditions, depth of water, and gravity of the oil. Governments compete by setting different government takes for different environments—for example, for onshore conditions and for offshore or deep water conditions. Thus, Thai onshore terms compete with Indonesian and Malaysian onshore terms, and Thai deep water terms compete with Indonesian and Malaysian deep water terms (table 1). This differentiation is intensifying the global competition for private investment in petroleum exploration.

**Conclusions**

The study shows that there is an active international market for exploration acreage. The “price” of the acreage is the government take, generally between 40 percent and 85 percent of the cash flow of an oil field.

Governments compete to attract investments. But the competition is primarily regional, and as a result, some countries or areas are not competitive at a global level. On average, fiscal systems make small but potentially profitable oil fields uneconomic. Although this approach might be expected from oil-producing and oil-exporting countries, it is not in the best interests of oil-importing and self-sufficient countries. Moreover, world oil production could be increased significantly if importing and self-sufficient countries offered better terms for such fields.

Over the past decade, government takes have declined, and many countries have differentiated the terms they offer to reflect different economic and geological conditions.

<sup>1</sup> In this Note, fiscal terms do not include downstream fuel taxes. For a copy of the report on the study’s findings, “A Comparative Study of World Fiscal Systems for Oil and Government to Government Competition,” by Pedro van Meurs (Gordon Barrows, New York, 1994), call Ms. Shirley Rajan, 202-458-2317.

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