

APPENDIX 4

THE OCS PETROLEUM PIE

by

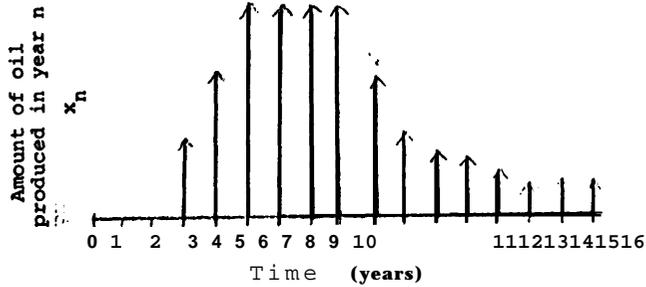
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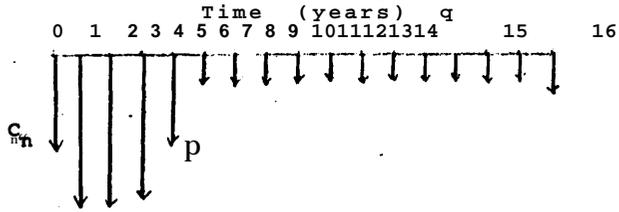
February 28, 1975

1.4 The Unit Resource Cost of OCS Oil

often it is convenient to place our present value calculations on a unit (per barrel) basis. Suppose that in order to produce and land the following time stream of oil from an offshore-find



will require the nation to invest resources in each year whose cost in national income--the market value of what these resources could produce elsewhere--is  $C_n$ . That is, our investment time stream might look like:



The present value of these costs is

$$\sum \frac{C_n}{(1+i)^n}$$

Since in this analysis our black box is the nation, we want to include in these costs only those financial transactions, those expenses, which represent actual diversion of resources to the offshore development. For example, the  $C_n$  would not include any payments to public bodies such as taxes, bonus bids, or royalties, which represent transfers of national income rather than diversion of resources. In order to put these costs on a unit basis we ask ourselves, what per-barrel price,  $c$ , would result in present valued revenues equal to these present valued, i.e.,

$$\sum_{n=0}^N \frac{c \times X_n}{(1+i)^n} = \sum_{n=0}^N \frac{C_n}{(1+i)^n}$$

where  $N$  is the life of the field. This is the break-even price on the development from the point of view of the nation; i.e. if oil can be landed from alternative sources, say, by importation at a cost of  $c$ , we will just break even in terms of national income by producing this offshore oil. If the cost to the nation of alternative sources is higher than  $c$ , then national income will be increased by the difference between this cost and  $c$  on a unit basis. If the cost to the nation of oil from alternative sources is less than  $c$ , then national income will be decreased by the difference. In this case, the resources required to produce the oil would be more profitably employed elsewhere.

We will call  $c$  the unit resource cost of OCS oil.

Notice included in  $c$  is a normal return to capital. That is, if our development is privately financed at price  $c$  the developers will be earning an interest  $i$  on their investment.

### 1.5 Economic Rent and Excess Profits

It has sometimes been alleged that in the absence of bonus bids, royalties, etc., the savings associated with domestic offshore oil would be passed on to the consumer in the form of lower prices. In this case, the increases in real national income would automatically accrue to the public. If this were the case, then one could make an argument for such simple OCS management policies as claim staking, both from the point of view of national income and public income.

However, in the absence of direct price regulation, this simply will not happen. Even assuming pure competition among the OCS leaseholders (homesteaders if you like), the landed price of OCS oil will not drop below the landed price of OPEC oil unless there is enough domestic production to push all foreign oil off the U.S. market--an extremely unlikely event.\*

The reason is simple. Assuming competition, landed price of this oil will be determined by supply and demand. The supply curve of crude to the United States looks something like Figure 1.2. On the left-hand side of the curve is the domestic supply as a function of its unit resource cost to the nation. As we shall see, some of this oil can be quite cheap. The horizontal portion of the curve on the right represents imported crude. The reason why this portion of the curve is essentially horizontal is that the cartel of exporting countries,

\*Or direct price control.

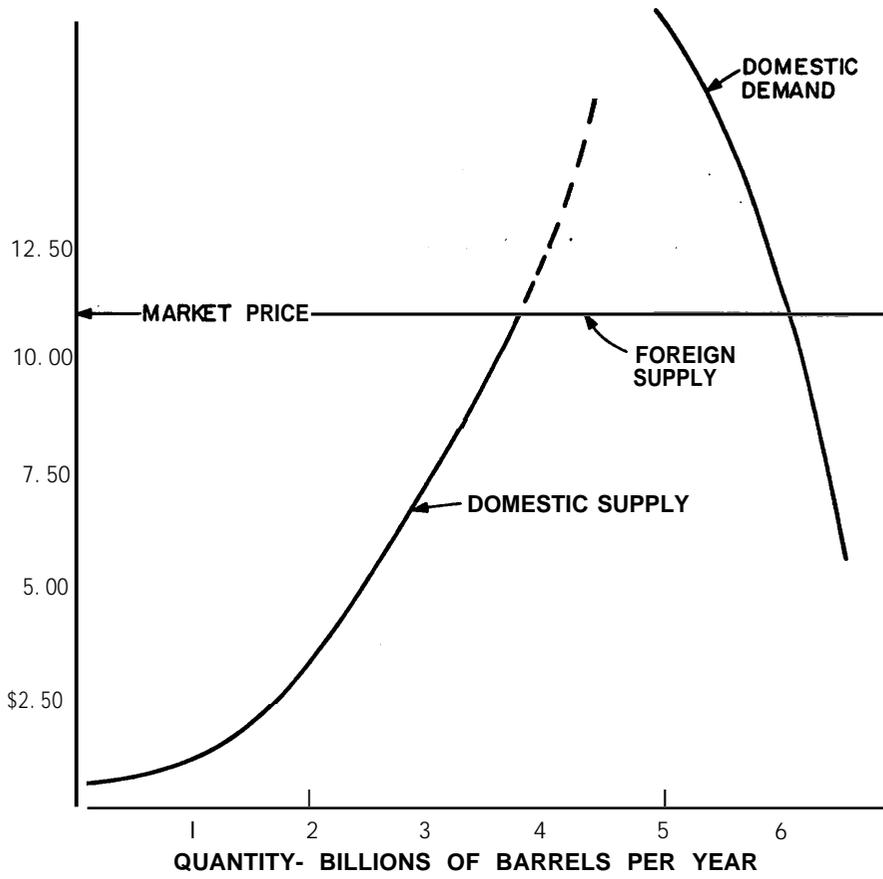


FIGURE 1.2 SKETCH OF U.S. OIL SUPPLY/ DEMAND

under OPEC leadership, attempt to adjust their prices so that from the U.S. point of view it is as expensive to import from one source as from another. Essentially, once you meet the OPEC price you can buy as much oil at that price as you want.\*

At present, the U.S. is importing some 2.25 billion barrels per year, about 38% of consumption. Unless domestic production increases to force all this oil off the market, demand curve will intersect the supply curve on the horizontal portion of the supply curve. The vertical level of intersection will determine the domestic price of crude. Regulation aside, no domestic producer will sell his oil for less than the landed price of foreign crude, for he knows that there are domestic buyers who are paying this price to whom he can sell his oil.

Given this situation, let's consider what will happen if we make a large find on the OCS. As we shall see, the landed resource cost of such oil can easily be less than \$2.00. The effect of such a find on the supply curve of domestic oil is sketched in Figure 1.3.

As shown, the find is equivalent to a rightward shift of the supply curve at the unit resource cost of landing this find--\$2.50 per barrel in the sketch. The

\*This is not true during actual embargoes. From time to time the exporter cartel may call an embargo to raise the overall level of the horizontal portion of the curve. However, it is in the interest of the cartel to keep these embargoes relatively short; as soon as the price rise has been effected, the embargo is lifted and once again one can purchase as much as one wants at the new price.

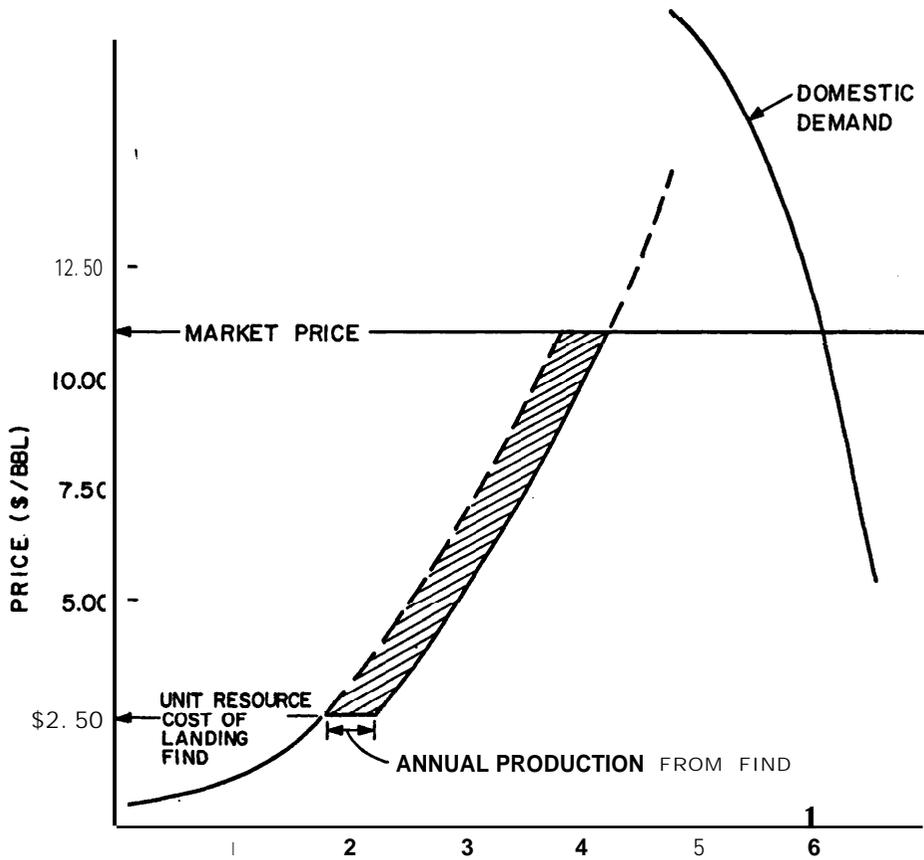


FIGURE 1.3 SKETCH OF U.S. OIL SUPPLY AND DEMAND WITH LARGE NEW FIND

amount of the shift is equal to the annual production from the find. Note that unless the amount of the shift is sufficient to push all foreign oil off the domestic market, there will be no change in price, for the intersection of the demand curve and supply curve is still at the same vertical level. Under competition, market price will not be affected by individual find unless the aggregate of such finds pushes all foreign oil off the U.S. market. To the extent that the relevant markets are not completely competitive, this statement holds a fortiori.

The fact that price is not affected does not mean that there has been no increase in national income. In fact, the annual increase in national income associated with the hypothetical find sketched in Figure 1.3 is the hatched area in the figure. This is the difference between the unit cost to the nation of imported crude and the unit resource cost of the OCS find multiplied by the amount of the find. In this case, we are replacing \$11.00 foreign crude with \$2.50 domestic crude for a net gain in national income of \$8.50 per barrel.

The hatched area, the gravy if you like, is known as the economic rent associated with the find. Where, then, will ~~this~~ increase in national income, this economic rent, **show up?** It will be split between the public and the investors in the development. The former will see lease payments, royalties and income taxes which would not occur if the resource were not developed. The latter will see

profits in excess what he would have achieved without the development. Notice that here we are using the word profits in a very restricted sense to imply profits above and beyond the normal return to capital which the investor could earn elsewhere, for this normal return to capital has been included in the unit resource cost by the present valuing process. To emphasize this usage we will use the term 'excess profits' to describe these increases in developer income. Excess profits is not used in a pejorative sense. It is a technical term meaning profits greater than the normal return to capital.

The actual split between the public and the developer will, of course, depend on the OCS management policy being employed. On the one extreme, simple homesteading and no income taxes, the entire increase in national income, all the economic rent would go to the developer in the form of excess profits. On the other extreme are systems in which the developer is forced to bid away all the excess profits in the form of lease payments, royalties and taxes in which case all the economic rent would accrue to the public. This split, the cutting of the pie, will be one of the central issues in our discussion of alternative leasing policies.

## ATTACHMENTS

- Attachent A. OCS Lands Act of 1953 and code of Federal Regulations
- Attachment B. Department of the Interior OCS Orders 1 thru 12
- Attachment C. <sup>(Comparing and)</sup> Analysis of S. 521 and S. 426 ~~Relate to S. 3221 of the 93rd Congress~~
- Attachment D. Analysis of S. 740, "The National Energy Production Board Act of 1975"
- Attachment E. Oil and Gas from the Outer Continental Shelf: Analysis of the "Energy Supply Act" and Summary of the Senate Debate on S. 3221
- Attachment F. An Analysis of the Department of the Interior's Proposed Acceleration of Development of Oil and Gas on the Outer Continental Shelf
- Attachment G. Letters Requesting OTA Study