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THE SYSTEM OF GOVERNMENT SUBSIDIES TO THE OIL INDUSTRY*

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It seems entirely appropriate for the Senate Sub-Committee on Antitrust and Monopoly to conduct hearings on governmental intervention into the market mechanism of the petroleum industry. There is in fact a system of tax subsidies to stimulate petroleum resource discovery and production, together with production and marketing controls designed to restrict supply and thereby maintain oil prices substantially above competitive levels. Import quotas have been instituted in order to insulate the domestic oil market from the challenge of foreign competition. Given this barrier to free entry into the U. S. market, the price of crude oil in the United States is approximately double the free-market world price. In the first half of 1968 the Japanese government purchased approximately 2.3 million barrels per day of largely middle eastern crude at prices averaging $1.42 per barrel. This oil had an average API Gravity rating of 32.3 degrees. In contrast crude prices in the United States for similar gravity ratings have been about $3.00 per barrel.

The largest Japanese purchases were of Iranian heavy crude oil at a price of $1.35 per barrel. Table 1 shows that this oil might be transported to the east coast markets of the United States and would have a delivered price of about $2.10 per barrel before pay-

TABLE 1

COMPARISON OF U.S. AND WORLD PRICES OF CRUDE OIL

Midle East Crude Oil	
Price of Iranian heavy crude 31.0° average gravity FOB	$1.35
Transportation cost to U.S. east coast port	.75
Total delivered price before tariff	$2.10
U.S. Tariff 10½¢ per barrel	.10
Total delivered price after tariff	$2.20
U.S. Crude Oil	
Price of Texas crude 31-31.9° gravity, Refugio, Texas	$3.12
Transportation cost to east coast port	.30
	$3.42

* This article was presented before the Subcommittee on Antitrust and Monopoly, Senate Committee on the Judiciary, March 11, 1969. The Subcommittee was authorized by S. Res. 40, 91st Cong., 1st Sess., 115 Cong. Rec. 5681 (1969), to conduct hearings on government intervention in the market mechanism as it affects the petroleum industry. The hearings are available on request from the Subcommittee.

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ment of tariff. U.S. crude oil, having the same gravity rating, can be purchased at a Texas Gulf port for $3.12 per barrel and delivered to the east coast at a delivered price of about $3.42 per barrel. This delivered price difference of $1.32 per barrel could not exist except for the protection afforded by the tariff and import quota.[1]

Further evidence supporting the price differential shown in Table 1 is provided by the fact that import "tickets" have in recent years had a market value of about $1.25 per barrel. The value of a ticket to import one barrel of crude oil into PAD districts I-IV (east of the Rocky mountains) has recently, and probably temporarily, fallen from $1.25 per barrel to about 75 cents per barrel.[2] This is the result of substantially higher freight rates due in turn to the Suez Canal closure and to a shortage of large oil tankers.

A recent U.S. Department of Interior study conservatively estimated that if import quotas were removed the impact of world competition would cause the American price of crude oil east of the Rocky Mountains to decline approximately 95¢ per barrel.[3]

The relatively high U.S. price of crude oil is the result of a complex system of tax subsidies and production restrictions imposed on behalf of the domestic oil industry. Import quotas are simply a capstone which the system requires in order to be insulated from foreign competition.

The purpose of this paper is to review the system of oil industry subsidies in total. I understand that others in this symposium will concentrate on detailed analysis of the component parts of the subsidy system.

I

PERCENTAGE DEPLETION ALLOWANCE

Percentage depletion must be distinguished from the conventional right to a tax-free recovery of a previous investment. Rather, it is historically based on a tax-free flow of income equal to the *estimated value of the oil property at the point of discovery*. The Revenue Act of 1918 granted a 100 percent tax-free income equal to the discovery value of the oil property, independent of discovery costs. The Revenue Act of 1924 reduced the tax-free income flow to

1. All should be warned that oil price and cost data are extremely complicated. Free market prices are scarce and may involve tax conditions, side payments, trades, as well as quality and geographical differences that are not clear.

2. Oil & Gas J., Dec. 2, 1968, at 25.

3. Office of Assistant Secretary of the Interior, Cost of the Oil Import Program to the American Economy 1 (Jan. 16, 1969). Since this study was authorized and issued by the Department administering the oil import program, any bias would be expected to minimize the cost to the economy by minimizing the spread between U.S. and world crude prices.

a maximum of 50 percent of the property's net income. In 1926, the present rule of thumb was established permitting 27½ percent of the gross income (not net) from an oil property to be free of tax, up to a limit of 50 percent of the net income from that property. Thus, where the full value of the depletion allowance is used, the effect is to reduce the federal income tax rate on oil income by half.

While percentage depletion allowance is based historically on discovery value rather than a tax-free return of an initial investment, the latter is also permitted for important items of exploration and development cost. The present law permits *depreciation* of all tangible equipment costs for producing wells. In addition, lease rentals and all intangible drilling costs may be *expensed* as incurred including expenditures for labor, fuel, power, materials, supplies, tool rental and repairs of drilling equipment in connection with drilling and equipping wells. Therefore, a taxpayer electing to take percentage depletion instead of cost depletion not only receives up to 50 percent of the property's net income free of tax, but receives a tax-free return of all of his initial investment except his lease acquisition costs and his exploration expenses. For productive wells, he may recover these costs only by electing to take cost depletion in lieu of percentage depletion. For non-productive wells, even these may be expensed when the property is abandoned.

Various devices are also available and are used to minimize the effect of the 50 percent limitation. For example, an integrated oil company may be able to increase its reported income per property by either or both shifting some expenditures from charges against the property to charges against other corporate income, and by inflating the accounting value of its oil at well head. Both devices will increase the reported net income of the oil property and thereby weaken the 50 percent limitation. Further, the "ABC deal" involving production payments may be utilized to increase net income for an oil property in a year in which the *50 percent limit* would otherwise restrict depletion allowance benefits.[4]

Percentage depletion allowance benefits were introduced during and following World War I as a tax subsidy to encourage oil exploration and development. Since investors make investment decisions on the basis of their anticipated after-tax rates of return, and since the depletion allowance permits a sizable reduction in corporate or personal income taxes, we should expect an increased flow of capital into oil exploration and production at the expense of

4. For a discussion of the ABC Deal see Wilkinson, *ABC—From A to Z*, 38 Tex. L. Rev. 673 (1960), and Galvin, *The "Ought" and "Is" of Oil and Gas Taxation*, 73 Harv. L. Rev. 1499 (1960).

other investment alternatives. This should be followed in time by expanded output (a shift of the short-run supply curve to the right).[5] As a further consequence, the price of oil would be reduced below levels which would otherwise prevail.

II

MARKET-DEMAND PRORATIONING

Price depressing effects of the percentage depletion allowance tax subsidy were accentuated, probably fortuitously, by the discovery of the East Texas oil field in 1930. This discovery substantially increased the supply of oil at a time when demand was declining. Consequent sharp declines in the price of oil, together with unrestricted drilling and production from jointly owned oil properties, culminated in the passage of prorationing laws in the leading oil producing states.[6]

Prorationing may be defined as "the rules and procedures by which a regulatory agency determines the total crude-oil production from a state and allocates the total among the various reservoirs and to the producers in each reservoir."[7] Prorationing consists of two parts: (1) MER (maximum efficient rate) prorationing and (2) market-demand prorationing.

(1) MER prorationing attempts to calculate the maximum efficient rate of production, presumably on the basis of physical characteristics of the reservoir, and production quotas are then prorated (rationed) among the producers involved. These permitted levels of production are called "allowables." The need for MER type prorationing follows from the fact of common reservoir ownership.

5. The assumption is made that the supply of uncommitted oil leases is not perfectly inelastic. We have no information on the extent of the current increase in production due to this tax subsidy. It is obvious that the tax subsidy does not increase oil in the ground, but presumably causes it to be produced earlier rather than later. For a discussion of the resource misallocation effects of the percentage depletion allowance provision, see A. Harberger, *The Taxation of Mineral Industries* in Federal Tax Policy for Economic Growth and Stability (A Compendium of Papers presented to the Joint Committee on the Economic Report), 84th Cong., 1st Sess. (1955); S. McDonald, Federal Tax Treatment of Income From Oil and Gas (1963) (especially ch. 3); A. Kahn, *The Depletion Allowance in the Context of Cartelization,* 54 Am. Econ. Rev. 295 (1964).

6. The first state to undertake prorationing was Oklahoma. The Oklahoma Corporation Commission instituted prorationing in September 1928. Texas followed with its first attempt at statewide prorationing in 1930. On August 27, 1935, Congress approved the Interstate Compact to Conserve Oil and Gas and the Interstate Oil Compact Commission was created on September 12, 1935. The purpose of the Compact was "To conserve oil and gas by prevention of physical waste thereof from any cause." Interstate Compact to Conserve Oil and Gas, ch. 780, 49 Stat. 939 (Aug. 27, 1935).

7. W. Lovejoy & P. Homan, Economic Aspects of Oil Conservation Regulation 127 (1967).

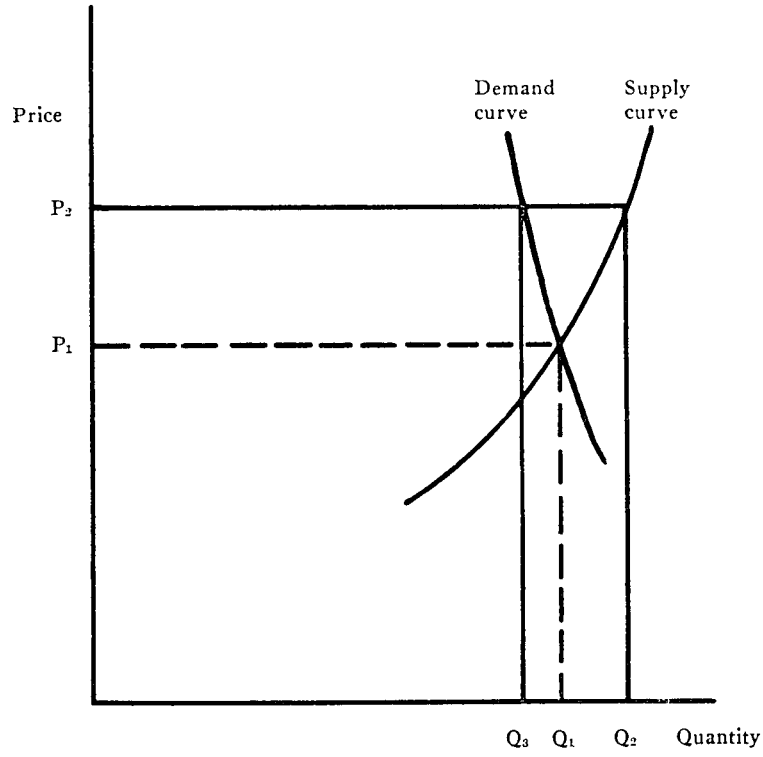
In the absence of unitization and MER type prorationing, each owner of the common property, oil, in a given reservoir would compete to recover at least his full share before it was drained away by other owners. The result would be vast overinvestment and inefficient utilization of the oil reservoir. While the need for MER type prorationing is granted, the only justification for market-demand prorationing is from the resource owner's point of view, who presumably would prefer high prices for his crude rather than low prices.[8]

(2) Under market-demand prorationing the state regulatory agency determines and restricts production to a level calculated to equal the quantity demanded at the prevailing price. This determination is made on a monthly basis. Market-demand prorationing normally further restricts production below the maximum efficient rate of production. For example, the Texas Railroad Commission has determined that for the month of February 1969, non-exempt operators in Texas may produce at only 42.8 percent of their allowable production. Thus while the MER allowable is theoretically related to production efficiency for a given reservoir, market-demand prorationing is related to the quantity that the market will absorb at a "desired price" of crude oil. The desired price is maintained by restricting the level of production. Article V of the Interstate Oil Compact specifically denies any price fixing intent. Article V states, "It is not the purpose of this Compact to authorize the states joining herein to limit the production of oil and gas for the purpose of stabilizing or fixing the price thereof, or to create or perpetuate monopoly. . . ." However, unless the law of demand has been repealed for oil, larger quantities will be demanded at lower prices, and production restrictions will generate higher prices.

The price effect of market-demand prorationing can be clearly seen in Figure 1. At P_1, the quantity demanded equals the quantity supplied at Q_1. This is the normal situation in a free price market. Where a higher price is desired, for example, P_2, the quantity demanded is only Q_3. But at this more attractive price, from the seller's point of view, Q_2 will be supplied. The excess of quantity

8. While granting the need for MER type prorationing, the manner in which it is currently administered has been subject to widespread criticism. The calculation itself has been shown to be faulty from the economic analysis point of view. Further the most inefficient wells are frequently exempt from prorationing (particularly market-demand prorationing in Texas) while the most productive wells are forced to curtail output and thereby to operate inefficiently. Hardwicke has estimated that the economic waste due to unneeded wells in Texas alone amounts to more than $100,000,000 a year. *See* Hardwicke, *Oil Well Spacing Regulation and Protection of Property Rights in Texas,* 31 Tex. L. Rev. 99 (1952). For an extensive analysis of economic inefficiency see Lovejoy & Homan, *supra* note 7, at chs. 4-7.

FIGURE 1
ILLUSTRATION OF "EXCESS CAPACITY"



supplied over quantity demanded (the distance Q_3 to Q_2) would force the price downward toward P_1 in a free market system. In order to obtain the desired higher price (P_2) producers must submit to production controls. Specifically, production must be limited to Q_3 since this is the quantity which the market will demand at P_2 the desired price. The function of market-demand prorationing is to restrict output to some level such as Q_3 since this is the quantity which the market will absorb at the desired price. Market-demand prorationing at less than 100 percent of the maximum efficient rate of production creates a situation of excess capacity with its consequent social cost of overinvestment.[9]

9. While one may dispute the exact degree of supply and demand elasticity (the slope of the supply and demand curves) and the deviation of P_2 (the present price of American crude) from P_1 (the price which would prevail in a free market), Figure 1 describes the essence of the market demand prorationing problem. The demand curve illustrated in Figure 1 is shown to be relatively inelastic as is generally assumed. *See* Interstate Oil Compact Commission, A Study of Conservation of Oil and Gas in the United States 122 (1964).

Administrators of state prorationing systems have maintained the judicious fiction that the objective of prorationing is the prevention of waste. One official, when questioned about the price effect of prorationing, replied "We have nothing to do with price. We are forbidden to consider economics; purely physical waste. I know nothing about price."[10]

As indicated in Section I above, percentage depletion allowance, as a significant tax subsidy, has the effect of shifting the supply curve for oil to the right and, in the long-run, depressing oil prices. The 27½ percent depletion allowance rate has now been in effect for forty-three years and presumably would have brought about an expansion of oil production and depressed prices to the point where the after-tax rate of return on oil exploration and development investments would be only normal. The price depressing effect, however, has been prevented by market-demand prorationing. In effect, one interference with the market mechanism (depletion allowance) has stimulated production and brought forth a second interference with the market mechanism (prorationing) introducing production controls.

Market-demand prorationing, however, rests on a precarious foundation. The leading oil producing states, excepting California and Wyoming, have market-demand prorationing controls. Lovejoy and Homan found that the states having market-demand prorationing account for 75 percent of U.S. crude production.[11] These states bear the burden of price fixing. Their dilemma is that of a dominant firm (or group of firms) that chooses to behave as a monopolist in an oligopolistic industry. They must restrict output in order to maintain the desired price while producers in nonmarket-demand states are free to maximize their own profit given the artificially maintained high price. As recently as mid-1966, Oklahoma, the fourth largest oil producing state, restricted production to 38 percent of the maximum efficient rate. For February 1969 the permitted rate was raised to 90 percent. Effective for March 1969 the Oklahoma Corporation Commission announced that production at 100 percent of the maximum efficient rate would be permitted. Thus, if we may assume that Oklahoma's MER type prorationing involves no price fixing features, then Oklahoma has in effect passed the burden of price stabilization to other market-demand states.

10. Testimony of Ernest O. Thompson, Member of Texas Railroad Commission, at the Hearings of the Committee on Interstate and Foreign Commerce, House of Representatives, 85th Cong., 1st Sess. (1957) in W. Lovejoy & P. Homan, Economic Aspects of Oil Conservation Regulation 240 (1967).

11. *Supra* note 10, at 129.

III

OIL IMPORT QUOTAS

Under conditions of free trade, the ability of an oil price conspiracy to raise domestic prices above the competitive equilibrium level is limited by the prevailing world price plus freight charges to the United States. If the domestic producers desire a price in excess of this premium then they must obtain import barriers usually in the form of tariffs or import quotas. The American oil industry has obtained both. The current tariff on crude oil is 10½ cents per barrel. This rate has been in effect since 1943.

On July 29, 1957, President Eisenhower asked oil importers operating east of the Rocky Mountains to voluntarily reduce their crude oil imports to 10 percent below their average for 1954-56; that is, to about one million barrels per day. Under strong pressure from the Independent Petroleum Association of America, supported in turn by the National Coal Association, President Eisenhower on March 10, 1959 ordered mandatory quotas on imports of crude oil, gasoline and other finished petroleum products. On April 30 the order was amended to exempt from the mandatory limits oil shipped by overland transportation from Canada and Mexico. Imports into Districts I-IV (the area east of the Rocky Mountains) are limited to 12.2 percent of estimated domestic production in these Districts, less the exempted production from Canada and Mexico. Imports into District V (the area west of the Rocky Mountains) were limited to the difference between (1) the sum of District V domestic supply and exempt imports from Canada and Mexico and (2) total demand (at the desired price) in that District as estimated by the Bureau of Mines.

Given the relatively high U.S. price for crude oil, resulting in part from market-demand prorationing, U.S. oil exports declined and imports into the United States increased sharply. The trends from 1939 through 1958 are shown in Figure 2. Figure 3 shows the ratio of crude oil imports to the domestic demand for all oil products from 1939 through 1968. We find that imports increased from 2.7 percent of total demand in 1939, to 11.6 percent in 1957 when voluntary import restrictions were imposed. From 1957 to date the ratio of imports to domestic demand has declined under the impact of import quotas. Figure 2 shows, however, that the absolute level of imports increased after the imposition of controls, but at a lower growth rate.

Import restrictions have had the effect of producing a gap between American and world crude prices amounting to approximately

FIGURE 2

RATIO OF CRUDE OIL IMPORTS TO DOMESTIC DEMAND FOR ALL OILS

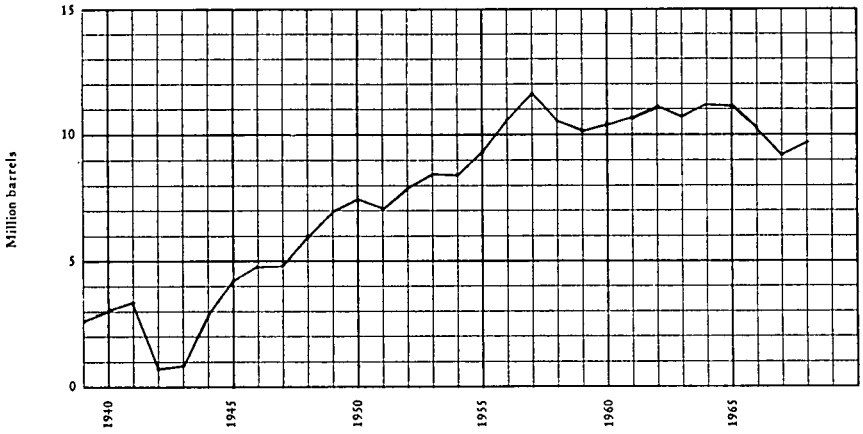
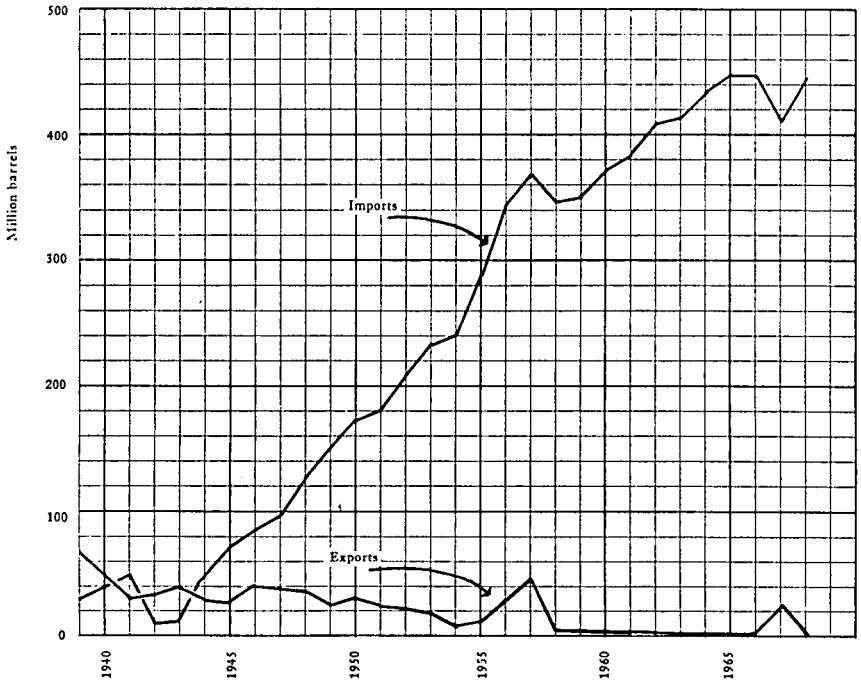


FIGURE 3

CRUDE OIL EXPORTS AND IMPORTS



$1.32 per barrel in excess of transportation charges. Thus import quotas and the tariff are part of the system of subsidies received by the oil industry. Market-demand prorationing, as a price fixing device, would have limited effectiveness in the absence of import restrictions.

IV

U.S. FEDERAL INCOME TAX CREDIT FOR FOREIGN ROYALTIES PAID

Another major subsidy is available only to the international oil companies. In the United States when oil companies pay royalties to landowners, whether government or private, such royalty costs are treated as normal expenses of doing business. But when certain legal formalities are observed, royalties paid to foreign governments may be classified as foreign taxes and are treated in lieu of U.S. corporate income taxes. This tax treatment means that such foreign royalty expenses involve a zero after-tax cost to the American oil firm. In effect, the U.S. Government pays about 100 percent of the foreign royalty charges. The consequences are at least two-fold. First, foreign oil development is stimulated at the expense of development in the United States. It should be noted here that this subsidy runs counter to the stated intent of depletion allowance—to stimulate domestic oil exploration and development. Second, U.S. income taxes paid by American oil companies with international operations already reduced by the percentage depletion allowance and other tax favors, are further drastically reduced. The record shows that Standard Oil Company of New Jersey, the largest U.S. oil company, had an effective federal income tax rate of only 3.8 percent over the five year period 1962-1966. The twenty-two largest U.S. oil companies had an effective federal income tax rate averaging slightly more than 6 percent.[12]

V

RESOURCE MISALLOCATION

The net effect of the entire subsidy system available to the oil industry is over-investment in oil exploration and production and consequent misallocation of the nation's resources. We are developing resources at social costs of about $3.42 per barrel, that have a social value of about $2.10 per barrel. Resource misallocation in turn results in a lower standard of living than is otherwise available to the nation. To the extent that we do not wisely use our

12. 113 Cong. Rec. 24310 (1967) (Remarks of Senator Proxmire).

limited natural resources, our long run ability to defend ourselves is weakened.

The social cost of the system of subsidies for the oil industry is extremely high relative to subsidies paid to other sectors of the American economy. Professor Adelman has estimated that "the annual charge of this whole system of organized waste, including the import controls needed to insulate it from foreign competition . . . in my opinion is just over $4 billion."[13]

The effect of market demand prorationing and import quotas is to substantially raise the domestic price of crude oil and oil products. The effect of favored tax treatment is to reduce tax costs for oil companies relative to firms in other industries. These measures taken together substantially raise the expected after-tax profit rates on oil industry exploration and development investments in what would otherwise be submarginal uses of scarce capital. Investment in petroleum exploration and development is indeed expanded to the point where the after-tax rate of return is approximately equal to that which may be obtained on alternative uses of capital. Professor Kahn has summarized the misallocation effect as follows: "The fact that net returns on investment after taxes in the oil industry may not be unusually high thus constitutes not a defense of the (percentage depletion) allowance but the clearest possible proof of the misallocation it causes."[14]

Oil industry spokesmen have defended their various subsidies with the question, "If we receive all the subsidies which our critics allege, why is our rate of return on invested capital not substantially higher than other nonsubsidized industries?" The answer to this question is that a subsidy will raise the profit rate at the point in time at which it is conferred. Its effects, however, are eroded away with time as producers react to their more profitable situation by expanding into otherwise submarginal areas. This expansion leads to a decline in the rate of return toward a normal yield and to resource misallocation as well.

The oil spillage case in the Santa Barbara Channel is directly related to the subsidy system. Leases were purchased and drilling occurred in the California offshore area because such operations were made profitable by the subsidy legislation. Under free market conditions, oil prices would be substantially lower, tax costs substan-

13. M. Adelman, *Efficiency in Resource Use in Crude Petroleum,* 31 S. Econ. J. 105 (1964).

14. A. Kahn, *The Depletion Allowance in the Context of Cartelization,* 54 Am. Econ. Rev. 295 (1964).

tially higher in the oil industry, and the profit inducement to buy leases in the Channel would probably be lacking. To develop oil from such sources is to use up more economic value than is produced. In addition to this probable waste of resources, we have the external cost (aptly called "spillover costs" even before this oil spillage case) of environmental pollution.

Data are not available to test the proposition that removal of oil subsidies would remove the economic incentive to buy oil leases in the Santa Barbara Channel. Production records are not yet available on the federal leases, and may never be. Further, oil companies do not disclose their estimates of probable production, revenue, and costs of exploring for and developing the Channel oil resources.

However, we do have 14 years of data for the 1954 and 1955 federal leases on the outer continental shelf offshore from Louisiana. From the record of oil and gas production on these leases, a projection of future revenue may be made. We know that bonus payments totalling $216 million dollars were paid for these federal leases. These bonuses in total represent the bidders' best estimates of the discounted present value (in 1954 and 1955) of expected future net income after taxes for these leases. We have precise information on all physical production of oil and gas by years from the leases, annual rental payments, royalty payments, and well-head value for oil and gas. Reliable estimates may be made for pre-sale exploration cost, well drilling and equipping cost, and operating cost.

Revenue from oil production, actual through 1967 and projected thereafter to the year 2000, may be adjusted downward to the point where the U.S. crude price is equal to the world price (on a delivered basis to East Coast ports). A price decline amounting to $1.32 per barrel is assumed.[15] This adjustment would follow from the removal of the existing quotas and tariff, making prorationing unworkable. Further, tax costs may be adjusted upward from the 6 percent average rate actually paid by the 22 largest oil companies, to the 48 percent statutory rate. These adjustments to compensate for the removal of the major subsidies not only eliminate the entire $216 million of discounted present value (the bonus payments), but in addition result in an internal rate of return on the 1954-55 leases amounting to only 4.5 percent after taxes. This assumes zero bonus payment. These findings indicate that if oil companies expect to

15. World prices are assumed to be unaffected by the removal of U.S. subsidies. Further, the increased efficiency in domestic production that would result from removal of MER prorationing in the Louisiana outer continental shelf area has not been considered.

earn more than 4.5 percent after taxes on their oil development investment, they should have regarded the 1954-55 leases in total as having no present value.[16] This evidence lends support to the assertion that oil leasing in the Santa Barbara Channel would not have taken place in the absence of the subsidy system.[17]

Congress is now considering bills to prohibit further drilling and production of oil from the Channel area. If the system of subsidies is retained, such legislation may be necessary. However, the root of the problem lies elsewhere and it seems futile to prohibit, in new legislation, what is made very profitable by existing legislation.

I would recommend that steps be taken to internalize the external costs that society bears in the form of environmental pollution (that is, to make oil companies fully liable for all public and private damage).

I would further recommend that the system of subsidies described here be phased out over a period of about five years.

When the important external costs (and benefits) are internalized, and when subsidies are removed, private and social benefits from oil production will more nearly correspond. Only when these two steps are taken will the massive burden of resource misallocation in this industry be removed as a drag on this nation's strength.

16. Since some tracts were regarded as more promising than others, bids might have been submitted on some of the tracts, even under a no-subsidy system.

17. We know that some physical conditions in the Channel differ substantially from those in the Gulf of Mexico. In the California OCS area, water depths are greater, drilling costs are higher, and production is more hazardous due to the geological structure of the area. On the other hand, the U.S. Department of Interior study of import quotas estimated that in Region V the price decline due to the removal of quotas would be 20¢ per barrel less than for the Gulf of Mexico.