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## Horizontal Divestiture in the Petroleum Industry†

*Jesse W. Markham\* and Anthony Hourihan\*\**

“Divestiture” as applied to the oil industry has now clearly come to mean different things to different people, and often different things to the same people. On the one hand it has taken on all the attributes of a political slogan, very much like the “free silver” battle cry of the 1890’s. It inspired the introduction of over twenty bills in the Ninety-Fifth Congress and served as a plank in the Democratic Party’s platform of 1976, providing the one rallying point for the dozen or so candidates who sought the party’s presidential nomination. In fact, during the autumn of 1976 political television advertisements proclaiming some candidates’ support of oil company divestiture rained upon the viewing public with all the aesthetic elegance we associate with toothpaste and deodorant commercials—reaching a rather confusing high point with candidate Fred Harris’s vow to break up the eighteen “oil monopolies.”

Substantial evidence indicates, then, that those who urge horizontal divestiture in the oil industry champion a popular cause. As will be documented in some detail below, this popularity does not rest upon any reasonable expectation that the public might reap measurable economic benefits in the form of improved efficiency in either the “Pareto optimum”<sup>1</sup> or “Schumpeterian”<sup>2</sup> sense. On the contrary, the data strongly suggests that horizontal divestiture, as

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† Portions of this paper draw heavily upon data contained in the authors’ larger study; J. MARKHAM, A. HOURIHAN & F. STERLING, HORIZONTAL DIVESTITURE AND THE PETROLEUM INDUSTRY (1977) [hereinafter cited as MARKHAM]. The research time donated to this paper was supported by a grant from the General Electric Foundation.

1. A discussion of the whole family of propositions associated with Pareto optimality is contained in Boulding, *Welfare Economics* and Samuelson, *Comment*, in 2 A SURVEY OF CONTEMPORARY ECONOMICS 1-34, 36-38 (B.F. Haley ed. 1952).

2. J. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY 188-90 (2d ed. 1946).

contemplated in the Interfuel Competition Act (S.489),<sup>3</sup> would inflict economic costs for which society would receive no off-setting economic benefits. Nevertheless, in the economic climate that has prevailed since the Middle East's "October War" of 1973—the five-fold oil price increase by OPEC, rising gasoline and fuel oil prices, the severe winter of 1976-77, and its attendant natural gas shortage—the need for decisive action has become a matter of political urgency. Political leaders cannot, with credibility, promise their constituents dissolution of OPEC, temperate winters, or removal of the constraints of nature. They can offer, however, to break up the larger oil companies. Since motorists and home owners vastly outnumber large oil companies, this may, as Morris Adelman has pointed out,<sup>4</sup> make a lot of people feel better, thereby creating a public good of unspecified but substantial magnitude.

In this Article, we plan to analyze the divestiture issue in more conventional, industrial-organization terms.<sup>5</sup> It is generally agreed that divestiture is an appropriate antitrust remedy for excessive market power when such power gives its possessor a means of excluding competition and controlling price. Stated in the language of industrial organization, the purpose of divestiture is to break up the interfirm *modus operandi*, described variously as oligopolistic rationalization, conjectural interdependence, conscious parallelism, or tacit collusive behavior, that is commonly associated with highly concentrated industries containing a small number of competitively forbearing rivals.<sup>6</sup>

Although no one familiar with the vast body of literature on market concentration would contend that a test has emerged for establishing the threshold point at which the concentration level leads to tacit collusion, there is substantial agreement that four-firm concentration ratios exceeding fifty percent, especially those equal to or greater than seventy percent, are of legitimate public policy concern.

Joe Bain, for example, has stated that in markets within the highest concentration category, where more than seventy-five percent of industry output is supplied by the largest four sellers, firms would have a "maximum tendency to agree on a joint profit-maximizing price, and a minimum propensity to pursue indepen-

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3. S.489, 94th Cong., 1st Sess. (1975).

4. AMERICAN ENTERPRISE INSTITUTE, HORIZONTAL DIVESTITURE 22 (W. S. Moore ed. 1977).

5. MARKHAM, *supra* at †.

6. J. BAIN, INDUSTRIAL ORGANIZATION 135-36 (2d ed. 1968).

dent and antagonistic policies.”<sup>7</sup> In industries in which the largest four sellers supply from fifty-one percent to seventy-five percent of industry output, Bain is of the opinion that “joint monopoly tendencies still appear probable,” but that there is “an enhanced likelihood that these tendencies may be tempered or restrained by the independent antagonistic policies of individual sellers.”<sup>8</sup> When the largest four firms supply from twenty-six to fifty percent of industry output (a category into which most sectors of the petroleum industry fall under the generally used market definition), Bain concludes that the mutually recognized interdependence of sellers still may be “strong enough that strictly independent action is counter-balanced by some tendency toward concerted action for maximum joint profits.”<sup>9</sup> Furthermore, Bain points out that there is “a legitimate question as to whether we still have oligopoly” in industries in which the four-firm concentration ratio is thirty-five to fifty percent, the largest eight firms have forty-five to seventy percent of the market, and the industry as a whole contains a large number of sellers. One can, therefore, summarize Bain’s conclusions regarding concentration and the likelihood of tacit cooperation as follows:

TABLE I

Sales of Largest Four Firms as Percentage Share of Market	Likelihood of Tacit Cooperation
76 - 100	High
51 - 75	Moderate
26 - 50	Low
0 - 25	Very Low

Other seasoned students of antitrust theory have proposed more stringent criteria. In their now neoclassical study of the monopoly problem, Carl Kaysen and Donald Turner argued that: “Market power shall be conclusively presumed where, for five years or more, one company has accounted for fifty percent or more of annual sales in the market, or four or fewer companies have accounted for eighty percent of sales.”<sup>10</sup> Similarly, in 1967 the White House Task Force on Antitrust Policy defined an “oligopoly industry” as one in which:

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7. *Id.*

8. *Id.* at 136.

9. *Id.*

10. C. KAYSEN & D. TURNER, *ANTITRUST POLICY: AN ECONOMIC AND LEGAL ANALYSIS* 98 (1959).

- (i) any four or fewer firms had an aggregate market share of seventy percent or more during at least seven of the ten and four of the most recent five base years; and
- (ii) the average market share during the five most recent years of the four firms with the largest average market shares during those base years amounted to at least eighty percent of those same four firms during the five preceding base years.<sup>11</sup>

Finally, the proposed Industrial Reorganization Act<sup>12</sup> reserved a presumption of monopoly power for industries with a four-firm concentration ratio of at least fifty percent. We conclude, therefore, that economists and antitrust law scholars generally agree that a four-firm concentration ratio of fifty percent is the cut-off point below which significant market power cannot reasonably be inferred.

When the structure of the oil industry is assessed against these standards, the economic case for wholesale divestiture of the major oil companies becomes exceedingly elusive, and the case for requiring petroleum companies to divest themselves of nonoil energy assets is completely unintelligible. In any ranking of industry concentration ratios, the petroleum industry falls well within the bottom half of the list, substantially below the approximately forty percent average for all manufacturing.<sup>13</sup> According to the Federal Trade Commission Report on its investigation of the petroleum industry, the United States had 129 crude oil refining companies in 1972.<sup>14</sup> As of 1976 the largest four of these companies accounted for 32.7 percent of total refinery runs, the largest eight for 56.7 percent, and the largest twenty for 84.4 percent.<sup>15</sup> The level of concentration is slightly lower when calculated on the basis of installed refinery capacity.

Calculated concentration ratios for crude oil production and crude oil reserves are not entirely unambiguous statistics. Typically, the lease arrangement between a landowner and a producer provides that the owner holds title to a certain percentage of the oil produced from wells on his property. For many years these leases required the producer to find a market for the owner's share of the oil, an obligation the producer customarily fulfilled by buying the owner's oil at

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11. REPORT OF THE WHITE HOUSE TASK FORCE ON ANTITRUST POLICY, A-8 (The Neal Report, 1969), reprinted in 1 J. REPRINTS ANTITRUST L. & ECON. 720 (1969).

12. Industrial Reorganization Act, S.3832, 92d Cong., 2d Sess. (1972).

13. F. SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 63 (1970).

14. FEDERAL TRADE COMM'N STAFF REPORT TO THE SENATE COMM. ON INTERIOR AND INSULAR AFFAIRS, 93D CONG., 1ST SESS., PRELIMINARY REPORT ON ITS INVESTIGATION OF THE PETROLEUM INDUSTRY 18 (Comm. Print 1973).

15. U.S. Petroleum Market Volumes and Market Shares: 1950-1976 (API Discussion Paper No. 003R, Sept. 1977).

the prevailing posted price. Because of this practice, the Federal Trade Commission (FTC) has sometimes included the landowner's share in the producer's production. On the other hand, the American Petroleum Institute (API), guided by the fact that landowners hold legal title to their share of the oil and can exercise the right of independent ownership, does not include landowners' shares in producers' output for purposes of calculated market shares.<sup>16</sup> In recent years landowners, especially public landowners, have often exercised their ownership rights. For example, the city of Long Beach, California, owns several oil fields and exercises ownership over a large portion of the oil produced from them under contracts between the city and more than six different oil companies. Since the landowner's share historically has ranged from one-sixth to one-fifth, concentration ratios calculated by the API tend to average from four-fifths to five-sixths of those calculated by the FTC method. (See Table II).

TABLE II  
CONCENTRATION IN CRUDE OIL PRODUCTION, 1969

	<u>API Method</u>	<u>FTC Method</u>
Largest 4	25.5%	31%
Largest 8	41.2%	51%
Largest 20	60.8%	70%

Irrespective of the method used, however, the level of concentration in crude oil production in the United States is considerably lower than the average for all United States industry. (See Table III).

TABLE III  
CONCENTRATION IN CRUDE OIL PRODUCTION AND RESERVES, 1976

	<u>Production*</u>	<u>Reserves**</u> <u>Privately Owned</u>	<u>Total</u>
Largest 4	25.5	35.1	27.3
Largest 8	40.5	54.2	42.2
Largest 20	61.0	73.1	56.9

\*API Basis

\*\*1975

Source: J. MARKHAM, A. HOURIHAN & F. STERLING, *HORIZONTAL DIVESTITURE AND THE PETROLEUM INDUSTRY 12* (1977); *U.S. Petroleum Market Volumes and Market Shares: 1950-1976* (API Discussion Paper No. 003R, Sept. 1977).

16. The difference in the calculated concentration ratio under the two methods may be illustrated as follows: In 1974 total domestic petroleum liquid production amounted to 14,440 MB/D, of which the largest four producers, in terms of the oil to which they held legal title at point of production, accounted for 2,720 MB/D, or 25%. However, according to Federal Trade Commission estimates, these four companies purchased landowners' oil at the well-head amounting to an additional 580 MB/D, which, if added to their own share of the oil produced, would give them a total market share of nearly 31%.

If the landowners' share is excluded from producers' production, the largest four oil companies accounted for 25.5 percent of total domestic crude production in 1976. If the landowners' share is included, the largest four accounted for approximately thirty percent. Both of these concentration ratios, however, vastly overstate the share of the United States market in the hands of the top four domestic producers. In 1976, imports representing crude oil production no longer in the hands of the large international oil companies accounted for forty percent of total United States consumption. Hence, the true concentration ratio falls somewhere in the range of fifteen percent to nineteen percent.

These levels of concentration generally have been considered to establish a *prima facie* case that the industries involved are competitively structured; in fact, they conform reasonably well to the end results once contemplated in the proposed Industrial Reorganization Act.<sup>17</sup> Hence, for this reason, we may conclude that the case for breaking up the large oil companies horizontally is extraordinarily weak. Having reached this conclusion, however, one would have to concede that the only primary social costs of such dissolutions would be the sacrifice of certain long-established antitrust principles. Dividing the two largest present oil companies into, say, two Texacos and three Exxons may make the population happier without doing irreparable damage to the basic efficiency of the oil industry.

When it comes to the kind of horizontal divestiture contemplated in the Interfuel Competition Act, however, the prospective social costs are much larger than the mere abandonment of current antitrust doctrine. Since that act rests on the premise that there is a significant quantity of actual or potential competition among fuels, the measurement of concentration levels under alternative market definitions becomes relevant. (See Table IV).

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17. See text accompanying note 12 *supra*.

TABLE IV  
 CONCENTRATION RATIOS USING SELECTED DEFINITIONS OF THE ENERGY INDUSTRY  
 BASED ON PRODUCTION IN BTU EQUIVALENTS, 1974<sup>a</sup>  
 ENERGY INDUSTRY DEFINITION

Concentration Ratios <sup>b</sup>	Oil <sup>c</sup>	Oil & Gas	Oil & Gas & Coal	Oil & Gas & Coal & Uranium <sup>d</sup>	Oil & Gas & Coal & Uranium & Geothermal
4-Firm	26.0%	25.1%	19.1%	18.4%	18.4%
8-Firm	41.7	39.2	31.5	29.7	29.7
20-Firm	61.4	59.0	49.6	47.8	47

<sup>a</sup> BTU Heat Equivalent Weights: oil: 5,620,900 BTUs/bbl; natural gas: 1,102,000 BTUs/000 ft<sup>3</sup>; coal: 24,580,000 BTUs/short ton; uranium (U, O<sub>2</sub>): 430 billion BTUs/short ton; geothermal: 3,412 BTUs/kilowatt hour (FTC, CONCENTRATION LEVELS AND TRENDS IN THE ENERGY SECTOR OF THE U.S. ECONOMY 452 (1974)).

<sup>b</sup> Sources: Calculated from raw data from: FTC, CONCENTRATION LEVELS AND TRENDS IN ENERGY SECTOR OF THE U.S. ECONOMY (1974); corporate annual reports, various issues. *U.S. Coal Production by Company—1974*, in KEYSTONE COAL INDUSTRY MANUAL: (1975); House Committee in Mines and Mining (unpublished data).

<sup>c</sup> Net crude oil, condensate, and natural gas liquids.

<sup>d</sup> Uranium concentrate (yellow cake).

Table reprinted from MARKHAM, *supra*, at 11.

As one would logically expect, when the relevant market definition is enlarged from oil to include, successively, gas, coal, uranium, and geothermal deposits, concentration at the four-, eight-, and twenty-firm levels declines. Even with no adjustment for imports, the largest four firms account for only 18.4 percent of the total energy market, and the largest eight for only 29.7 percent.

Application of conventional principles of industrial organization to the uncontested facts concerning the oil and other energy industries leads to the fairly obvious conclusion that the appropriate remedy for improving the performance of energy companies does not lie in a wholesale restructuring of the industry. On this conclusion (the pending Federal Trade Commission case against the eight largest oil companies notwithstanding)<sup>18</sup> even the two antitrust agencies apparently agree. The FTC's 1974 report, *Concentration Levels and Trends in the Energy Sector of the U.S. Economy*, stated: "[t]his study does not provide any positive support to the proposal that petroleum companies be banned from acquiring coal or uranium

18. *In re Exxon Corp.*, No. 8934 (FTC, filed July 18, 1973). The complaint in this case appears to be more concerned with vertical than horizontal integration.



companies; nor . . . from acquiring coal or uranium reserves."<sup>19</sup>

Frederic M. Scherer, then chief economist of the Federal Trade Commission, reaffirmed this conclusion in his statement before the Joint Economic Committee,<sup>20</sup> and Thomas E. Kauper, Assistant Attorney General for Antitrust, stated before the Senate Committee on the Judiciary in 1976:

The petroleum industry appears to be one of the least concentrated of our nation's major industries. This data calls into question the propriety of massive structural reorganization. If the present structure does not exhibit the characteristics associated with excessive market power then a solution based on that premise may be both unavailable and counterproductive.<sup>21</sup>

We place considerable weight on these conclusions for reasons other than their entire consistency with our own. Energy companies, especially large oil companies, are scarcely viewed by the public with deep and abiding affection. Given the political emotion attached to the oil company divestiture issue, the most innocent of scholars who conclude that horizontal integration in energy is not anticompetitive easily may be accused by some of the Faustian sin of having sold their souls to Mephistopheles. We can live comfortably with the assumption that the two antitrust agencies have not yet been taken over by apologists for monopoly and that the leadership of neither organization has fallen into the hands of those having a special affection for large oil companies. Moreover, even those who support the Interfuel Competition Act have publicly acknowledged that their case for divestiture confronts the bothersome fact of low concentration. The late Senator Philip Hart observed in his speech at the Airlie House Conference on Concentration that by most standards the oil industry was not highly concentrated.<sup>22</sup> Dr. Walter Measday, staff economist for the Senate committee considering the legislation, has stated that "available statistics provide a surface appearance of moderate concentration . . . far less . . . than . . . in a number of other industries, ranging from automobiles and computers to men's underwear and paper napkins."<sup>23</sup>

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19. FTC, CONCENTRATION LEVELS AND TRENDS IN THE ENERGY SECTOR OF THE U.S. ECONOMY 260-61 (1974).

20. *Horizontal Integration of the Energy Industry: Hearings Before the Subcomm. on Energy of the Joint Economic Comm.*, 94th Cong., 1st Sess. 75 (1975).

21. *The Petroleum Industry: Hearings on S.2387 Before the Senate Judiciary Committee*, 94th Cong., 2d Sess. 60 (1976).

22. See the conference proceedings in *INDUSTRIAL CONCENTRATION: THE NEW LEARNING* (H. Goldschmid, H.J. Mann, & J.F. Weston eds. 1974). The reference is to Senator Hart's unpublished address to the conference's plenary session.

23. Measday, *Feasibility of Petroleum Industry Divestiture*, in *RESEARCH AND DEVELOPMENT IN ENERGY* 178 (D. J. Teese ed. 1977).

Since virtually everybody agrees that the case for horizontal divestiture on purely economic grounds is exceedingly weak, a return to the observation on which this Article opened is appropriate. Would the social good embodied in the apparent happiness horizontal divestiture would bring to many people entail substantial social costs? Although reducing this social benefit-social cost analysis to quantitative terms clearly is difficult, the evidence strongly suggests that the price of happiness would run high.

First, one must recognize that the proposed legislation would require the oil companies not only to divest themselves of their nonoil energy operations and reserves, but also to refrain from entering anew these energy industries in the future. Economists universally recognize that freedom of entry into an industry is a vital aspect of competition.<sup>24</sup> Since the Interfuel Competition Act would eliminate petroleum companies as both potential and actual entrants into other sectors of the energy industry, it would protect nonoil energy companies from the kind of competition that the anti-trust laws historically have fostered.<sup>25</sup> This anticompetitive feature of the bill takes on added significance when one further considers that petroleum companies, with their expertise in managing capital-intensive, long-lead-time, high-technology, natural-resource projects, are logical candidates for entry into other sectors of the energy industry.

Second, by investing in other energy sources and in research and development (R&D), the oil companies, in response to conventional market incentives, are doing precisely what our national energy policy calls for. Since 1975 federally-funded R&D in energy has moved gradually up the scale of national priorities until by fiscal year 1978 it ranked second only to R&D outlays for defense.<sup>26</sup> In recent years the R&D effort of oil companies also has increased and has shifted from an exclusive concern with oil and gas to the development of alternative energy sources. For example, in 1971, 90.2 percent of the industry's investment in R&D efforts was expended in the area of oil and gas. By 1975 this proportion had dropped to 76.2 percent. In the same five year period, R&D investment by petroleum companies in coal and shale took a giant leap upward,

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24. J. BAIN, *Conditions of Entry and the Emergence of Monopoly*, in *ESSAYS ON PRICE THEORY AND INDUSTRIAL ORGANIZATION* 74-94 (1972); J. BAIN, *BARRIERS TO NEW COMPETITION* 205-20 (1956); SCHERER, *supra* note 13, at 376-77.

25. *FTC v. Procter & Gamble Co.*, 386 U.S. 568, 580-81 (1967); *United States v. El Paso Natural Gas Co.*, 376 U.S. 651 (1964).

26. NATIONAL SCIENCE FOUNDATION, *SCIENCE RESOURCES STUDIES HIGHLIGHTS 3* (NSF77-323, October 1977).

from a bare 3.3 percent of total R&D expenditures to nearly sixteen percent.<sup>27</sup> The data also show that in the petroleum industry there is at least a weak positive relationship between firm size and R&D intensity; the eight largest companies account for a disproportionately large share of the industry's total R&D.

This pattern of R&D expenditures by major oil companies is consistent with the aims of national policy on energy research. Most of the recent large increase in the budget of the Energy Research and Development Authority has been directed toward the development of nonoil energy sources, the same area in which petroleum companies are increasing their R&D outlays. Were the oil companies precluded from investing in the development of alternate energy resources, it is highly doubtful that other firms in the private sector would take over the large R&D establishments found in the petroleum industry or create new ones of comparable magnitude to take their place. Furthermore, the significant synergistic effects and technology transfers that are attributable to the petroleum companies' participation in R&D in alternate energy resources would be lost if these companies were to undergo horizontal divestiture.

Finally, horizontal divestiture would reduce significantly the degree of asymmetry among energy companies, eliminate the potential for development of even greater asymmetry among these firms, and thereby reduce substantially the degree of interfirm competition. Asymmetry—dissimilarity among competing firms' assets, organizational structures, product lines, business strategies and objectives—is a potentially important element in the evolution of "workable competition" within an industry.<sup>28</sup> Horizontal diversification by petroleum companies clearly will lead to an even greater degree of asymmetry and, therefore, will make them more likely to compete with each other. Hence, even if one were disposed to argue *ex hypothesi* that the eight, twelve, or eighteen "pure" petroleum companies, in spite of the relatively low concentration at this level, might pursue a common course of action in respect to oil, one must concede the unlikelihood that the same number of firms would perceive as profitable such a concerted course of action once they had attained a considerable degree of asymmetry through interfuel diversification. In time, the varying percentages of their assets relating to oil, gas, geothermal deposits, shale, uranium, and the like would greatly reduce the possibility of a common course of action equally

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27. These figures were obtained through a survey of the 23 major oil companies. MARKHAM, *supra* at †, at 88.

28. *Id.* at 90-91.

sued to them all. Therefore, a legislative environment that fosters horizontal diversification by energy producers appears far more likely to maintain workable competition in the energy industry than one that forces each energy-producing firm to specialize in a single fuel. The degree of asymmetry in the energy industry will be increased substantially if oil companies are allowed to continue on their present diverse paths of horizontal diversification. Some companies have acquired or developed coal resources while shunning oil shale and geothermal deposits; some have developed geothermal and oil shale deposits, but have stayed almost entirely out of uranium and coal; and others have remained relatively undiversified, confining their activities to their traditional energy industry. The pattern effected through horizontal diversification, however, is one of increasing asymmetry among the major petroleum companies. Legislation that would greatly reduce this important means for increased competition might achieve results diametrically opposed to its stated objectives.

Abbot Payson Usher, the distinguished Harvard economic historian, often used major industries as vehicles for interpreting history. His parting comment on the oil industry—after noting the wastefulness of the “law of capture” and, among other anomalies in the U.S. energy policy, the inconsistencies of government-sanctioned import restrictions and toleration of maximum-efficiency-rate pricing in the domestic oil fields on conservation grounds<sup>29</sup>—was to the effect that as a nation we had pursued a mistaken public policy toward oil at every turn, and still we survived. Only our inherent economic strength saved us from such heavy doses of public policy mismanagement. The enactment of the numerous bills seeking horizontal divestiture within the oil and energy industries certainly may be in keeping with our historical policy record. This time, however, our inherent economic strength may have dissipated to the point at which we are now unable to withstand further improvidences in our energy policy.

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29. *ESSAYS ON PETROLEUM CONSERVATION REGULATION* (W.F. Lovejoy & J. Pikel eds. 1960); Markham, Book Review, 35 *CHI. J. Bus.* 318-19 (1962).

