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Petroleum Dismemberment

Stark Ritchie

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I. INTRODUCTION

Senator Philip Hart is regarded by friend and adversary alike as one of God's gentle creatures. Why he would seek to dismember the American petroleum industry is quite difficult to perceive. His divestiture proposal, S. 2387, would break the large, vertically integrated oil companies into diverse functional pieces. At least in part, his proposal is seemingly based on an aversion to big business per se. This hostility to large scale American enterprise fails to account for certain preliminary studies which indicate that large companies have contributed significantly to increases in technological progress, to faster gains in productivity, to flatter (or even downsloping) price trends, and to rising living standards. This particular opposition to large integrated oil companies seems to arise from a misunderstanding of the role of integration in petroleum operations and a refusal to believe that the large oil companies do compete with one another.

* General Counsel, American Petroleum Institute. B.A., University of Michigan, 1938; J.D., University of Michigan, 1941.

This article endeavors to explain the rationale of vertical integration, to discuss some of the arguments surrounding divestiture, and to describe the consequences of divestiture if S. 2387 becomes law. The following discussion shows that careful examination of the structure and performance of the petroleum industry fails to yield any conclusive evidence of inordinate monopoly power. On the contrary, the economic indicia strongly suggest that at the very least the industry is "workably competitive" at all stages.[1] Further, the contention that divestiture would strengthen this nation's interests vis-a-vis the Organization of Petroleum Exporting Companies nations has been dispelled. Thus the grounds used publicly to justify divestiture efforts appear to be specious. Unless there is some unperceived rationale for passing such legislation, its enactment would seem to be without reason and without any avowed or discernible benefit to society.

While there are great uncertainties whether divestiture would yield any benefits to society, it is clear that it would entail substantial costs. Although it is beyond the scope of this article to venture a precise quantitative estimate of the total cost that society would bear as a result of divestiture, the article will delineate the probable consequences for domestic petroleum consumers, affected firms, claimants on the assets of those firms, domestic energy supplies, and the United States economy in general.

II. THE RATIONALE OF VERTICAL INTEGRATION

A. *The Concept of Vertical Integration in General*

Before discussing the arguments concerning divestiture or its economic ramifications, it is appropriate to consider the theory of vertical integration as it applies to firms in general and to petroleum firms specifically in order to understand why firms choose to structure themselves in this manner and why economic benefits will be negated as a result of breaking up the oil industry.

The reason offered most frequently by economists to explain why firms vertically integrate[2] is that it is economical to internalize

1. There also does not appear to be much support in the economics literature for the notion that the industry could be made more vigorously competitive in the absence of vertical integration. *See* Peltzman, *Issues in Vertical Integration Policy,* in PUBLIC POLICY TOWARDS MERGERS 167-76 (Weston & Peltzman ed. 1969).

2. The term "vertical integration" refers to the extent that a firm controls assets spanning the entire range of successive production and distribution stages of any particular good. In the petroleum industry, it refers to the simultaneous operation in more than one of the industry's four phases: production, refining, transportation, and marketing.

certain exchange transactions rather than buy or sell in the marketplace.[3] Although a firm could choose to purchase its needed inputs rather than produce them and sell its output rather than process it further (or transport it farther), the opportunity to do so is not without cost.[4] Since the course of future events is uncertain, a firm disposed to making "arms-length" transactions with other firms is confronted with potential vagaries of price, quantity, and quality.[5] In order to schedule and coordinate production efficiently, the firm must gather information on market conditions in order to develop a reasonable set of expectations about the future.[6] Needed information, however, may be acquired only at a cost or sacrifice of real resources.[7] Even discovering the relevant price signals in the market requires an expenditure of resources.[8]

There may be additional costs associated with the search for appropriate trading partners, including costs of negotiating contracts, establishing favorable terms of trade,[9] costs of enforcing contract compliance, and costs of adjusting to stochastic variations in transaction prices, quantities, or qualities. When uncertainty is high and transaction costs are excessive, it is both reasonable and socially desirable from the standpoint of efficient resource allocation for firms to organize in a manner that reduces these costs just as they seek to minimize other costs of production. Quite simply, vertical integration reduces transaction costs because it reduces the number of interfirm transactions. It allows "economies of management"[10] to be achieved by promoting specialization in decisionmak-

3. Coase, *The Nature of the Firm*, 4 ECONOMICA (n.s.) 386 (1937).

4. *Id.; see* Malmgren, *Information, Expectations and the Theory of the Firm*, 75 Q.J. ECON. 399 (1961).

5. This reflects a tendency of individual firms to behave in an opportunistic, self-serving manner. While a firm's trading partner may be quite willing to transact business at certain specified terms today, it may be quite unwilling to accept the same terms under changed circumstances if its interests are compromised.

6. Coase, *supra* note 3; Malmgren, *supra* note 4. *See also* Teece, *Vertical Integration in the U.S. Oil Industry*, in VERTICAL INTEGRATION IN THE OIL INDUSTRY 108-09 (E. Mitchell ed. 1976).

7. J.B. McCollum, Information, Vertical Integration and Antitrust Policy, 1968 (unpublished doctoral dissertation at Tulane University) (copy available through the American Petroleum Institute).

8. *Id.*

9. Executing long-term contracts is an option available to firms seeking to reduce future market uncertainties. However, these contracts are inherently inflexible. Limits on the ability of firms to collect and retrieve information may mean that no contract can be written to cover all contingencies that might develop in time. Short-term contracts offer more flexibility, but additional costs are incurred because of the greater frequency with which contracts must be negotiated. *See* Teece, *supra* note 6, at 109.

10. *Hearings on S. 1167 Before the Subcomm. on Antitrust and Monopoly of the Senate*

ing, more efficient information flow, greater adaptability to unforeseen circumstances, and a commonality of interests.[11] This permits a firm to conserve on resources that otherwise must be spent in conducting open market transactions.

B. *Vertical Integration in the Petroleum Industry*

The enhanced coordination and planning brought about by vertical integration is especially important in the petroleum industry:

> Each stage of the industry—production, refining, transportation, and marketing—is highly dependent upon others. The success of a refinery is more a function of success in the raw materials and product markets than of success in refinery operations. It is apparently more efficient in many circumstances to plan jointly corollary and supporting investments than to rely on other firms at other stages to make the right investments at the right time in the right place. This is not to say that other firms couldn't make these investments. It is that they will make them less efficiently.[12]

The efficiencies referred to arise in part because of investment considerations that characterize the industry. Substantial capital sums are required to take advantage of scale economies in refining and pipeline transportation. Once these facilities are built, the capital is frozen in assets that are immobile, highly specialized in purpose, and have little or no salvage value. Investors in the pipeline transportation and refinery sectors of the industry inherently run the risk of earning low rates of return should the flow of crude oil or other products through their assets be reduced or interrupted. As a means of reducing risk, it is not surprising that they integrate to seek "assurances" of adequate supplies of crude oil or other products and dependable markets.[13] Scholars have long rationalized vertical integration of the oil industry in terms of assurances:

> The essence of integration . . . is the protection it offers or seems to offer against the uncertainties and instabilities of reliance on often highly imperfect intermediate markets. It is a means by which oil companies have attempted, in an industry that is potentially highly unstable, to stake out and insulate market positions by securing dependable sources of supply (of raw materials and products) and dependable market outlets (for crude oil and products).[14]

Comm. on the Judiciary, 93d Cong., 2d Sess., pt. 8, at 6065 (1974) (testimony of Edward Mitchell) [hereinafter cited as *Hearings on S. 1167*].

11. Teece, *supra* note 6, at 110.

12. *Hearings on S. 1167*, *supra* note 10, at 6065.

13. M. G. DE CHAZEAU & A. E. KAHN, INTEGRATION AND COMPETITION IN THE PETROLEUM INDUSTRY 115 (Petroleum Monograph Series vol. 3, 1959).

14. Mitchell, *Capital Cost Savings of Vertical Integration*, in VERTICAL INTEGRATION IN THE OIL INDUSTRY 80 (E. Mitchell ed. 1976). Explaining petroleum industry vertical integra-

Similarly:

> Vertical integration represents a means of reducing the risks associated with refinery investments because it serves to protect a refinery on . . . the points where it has great competitive vulnerability. Integration forward into marketing activities constitutes one of the best means by which a refiner may guard against a forced reduction of throughput in times when the refined products markets are oversupplied, and backward integration into crude oil production constitutes one of the best means by which a refiner may be assured of adequate oil supplies at reasonable prices in times of crude shortages. Similarly, integration into transportation operations constitutes one of the best means by which a refiner may be assured of having the transportation facilities necessary to his situation. For example, once a refinery location has developed economic characteristics which permit or require the use of pipe lines to move crude oil inward, or refined products outward, a refiner often cannot afford to wait for the pipe line investments to be made by outside interests but must build the lines himself to keep his operations on a competitive basis.[15]

The concern over the availability of crude oil supplies in the refining sector arises in part because of certain processing constraints. In some cases, a refinery is designed initially for a limited range of crude oil characteristics and is able to process crudes with differing characteristics only after making costly plant adjustments. Vertical integration helps to ensure adequate supplies of the preferred quality of crude at relatively constant costs over time.[16]

Most modern refineries, however, are geared to handle a variety of crude types that are sold in active markets. What probably contributes to the concern for availability is the history of crude oil price control in this country.[17] In the past, crude oil shortages have

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tion in terms of "assurances" may appear to differ at first glance from the transaction cost rationale advanced earlier for firms in general. Both explanations, however, are one and the same. Mitchell writes:

> As mentioned earlier, businessmen do not usually couch their arguments for vertical integration in terms of contractual or communication problems. Typically, they will think in terms of the importance of reliable supplies, assured markets, the reduction of risk, and lower financing costs. Yet, while what he says is seemingly different, the businessman is in fact saying the same thing as the economist. When the businessman says he must acquire an upstream supplier to assure reliable supplies he is saying that it is impossible to write an ironclad and complete contract with an upstream supplier that gives him the assurances he needs to run his plant efficiently, or that no upstream company knows exactly what he requires and none is likely to know it in the near future. In brief, because of the impracticability of perfect contracting or the lack of communication of his needs, it is cheaper and more timely for the businessman to do it himself.

Id.

15. J. McLEAN & R. HAIGH, THE GROWTH OF INTEGRATED OIL COMPANIES 665 (1954) [hereinafter cited as McLEAN & HAIGH].

16. These costs are relative to what it would cost refiners to purchase the desired crude elsewhere in conditions, for example, of market scarcity.

17. *Hearings on S. 1167, supra* note 10, pt. 8, at 6065-66 (1974). Crude oil prices were controlled formally during World War II, during the Korean War, and beginning in 1971 under President Nixon's New Economic Program. Today "old" oil, along with natural gas

developed as the value of crude exceeded the price permitted by government.[18] In other words, prices were set at such a level that the quantity of crude demanded by consumers exceeded the quantity producers were willing to supply. Faced with the specter of formal or informal price control in the past few decades, firms prepared for what they considered to be inevitable oil shortages. Even companies outside the petroleum sector, including chemical, automobile, and steel companies, recognized the reality of price control induced shortages and initiated integration backwards into the production of crude oil and natural gas in order to assure essential supplies.[19]

Alternative methods of obtaining assurances against unfavorable market contingencies clearly exist. Depending on how much a firm is willing to pay, it could enlist the services of additional crude oil brokers, bargaining agents, lawyers, and other personnel to reduce the probability of costly interruptions. It also could hold, although probably only at great cost, large crude inventories and product storage capacity. The point is not that vertical integration is the only means of achieving security or dependability of supply for large-scale capital investments; rather, because it is generally less expensive for a firm to control at least some crude oil sources or market outlets, it is more economically secure to integrate vertically.

Another economy traceable to oil industry vertical integration springs from the relationship of profitability between the various sectors of the industry. Studies indicate that profits in production, refining, transportation, and marketing do not correlate directly with one another. These studies further show that integration between sectors brings a degree of earnings stability to the oil firm so structured.[20] For example, a survey conducted over the period from 1920 to 1952 found that a nonintegrated mid-continent refiner

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sold in interstate commerce, remains subject to formal price control. Furthermore, on an informal basis, government *fiat* also has had a control effect on crude prices. In 1959, President Eisenhower's Proclamation Adjusting Imports of Petroleum and Petroleum Products into the United States empowered the Director of the Office of Civil and Defense Mobilization to maintain constant surveillance of crude oil price increases to determine whether such increases met with national security objectives. Pres. Proc. No. 3279, §6(a), 3 C.F.R. 11 (1964), 19 U.S.C. § 1862 (1970).

18. Mitchell bases this conclusion on the spurts in crude prices that took place during periods when controls were relaxed. *Hearings on S. 1167, supra* note 10, at 6065.

19. Dupont, for example, has announced its intention to invest in a 100,000 barrels per day refinery with Amoco for the purpose of reducing its reliance on others for energy supplies. *See* Brumm, *Talk Set on 100,000 B/D Grassroots Unit*, Oil Daily, Oct. 24, 1975, at 1, col. 1. *See also Hearings on S. 1167, supra* note 10, at 6066; *Dupont Signs Letter to Acquire Shenandoah Oil*, Wall Street J., Feb. 9, 1976, at 2, col. 2.

20. MCLEAN & HAIGH, *supra* note 15, at 501-06.

experienced average monthly fluctuations in gross margins four times greater than an integrated refiner.[21] Thus integrated oil firms, holding what amount to diversified asset portfolios, provide a service to investors that their nonintegrated counterparts do not, namely, reducing the risks attending investment.[22] As a result, the cost of capital[23] to an integrated firm is relatively lower, which means that it can attract and borrow funds more cheaply and thereby increase investment in all sectors of the industry more than would take place otherwise.

III. The Arguments for Divestiture Are Unsound

The proponents of divestiture express the view that the petroleum industry is dominated by a small, oligopolistic group of noncompetitive companies. A careful consideration of the arguments advanced by the proponents of divestiture shows that they do not sustain the heavy burden of proof which should be a condition precedent to such a punitive, drastic legislative proposal.

A. Competition in the Oil Industry

(1) Concentration Ratios

Divestiture proponents argue that there is an alarming degree of concentration in the energy industry.[24] They contend that this is evidenced by the major companies' control of crude exploration and production.[25] Intertwined with their argument is the belief that concentration in the oil industry is facilitated by the sharing of risks and profits through joint ventures in the ownership of crude oil

21. *Id.* at 118, 122-23, 133.

22. Raymond B. Gary of Morgan, Stanley & Co., Inc. testified before the Subcommittee on Antitrust and Monopoly that:

> Our experience in selling petroleum company securities over the years has been that investors place a high value upon the fact that the larger companies are vertically integrated and are hence generally more stable and economically more efficient, exhibiting a consequent lesser risk from an investment point of view. In our view, the generally high investment quality of these larger petroleum companies is in many respects attributable to the benefits of their vertically integrated structure.

Hearings on S. 2387 and Related Bills Before the Subcomm. on Antitrust and Monopoly of the Senate Comm. on the Judiciary, 94th Cong., 1st Sess., pt. 3, at 1970 (1976) [hereinafter cited as *Hearings on S. 2387*].

23. The cost of capital for an industry can be defined as the minimum expected rate of return necessary to induce capital to flow to the industry.

24. *Hearings on S. 2387, supra* note 22, pt. 3, at 2162 (1976) (statement of Senator Tunney).

25. 121 Cong. Rec. 1146 (daily ed. Jan. 29, 1975) (remarks of Senator Abourezk).

producing leases and production, pipelines, certain refining operations, and international ventures.[26]

Monopoly power is indicated generally by control of a market by one or a few sellers. Such monopoly power customarily is measured in terms of concentration ratios that are defined as the percentage of assets, value added, or output accounted for by a specified number of the largest companies in an industry.[27] Government studies of monopoly power commonly utilize concentration ratios based on value added by the largest four or eight companies in an industry.[28] It is generally thought that the higher the concentration ratio, the greater the monopoly power in an industry;[29] the theory is that the larger the share of the market controlled by a few firms, the more probable it is that they will be able to collude and strike agreements of mutual benefit.

Table 1 depicts the percentages accounted for by the four largest and eight largest companies in various energy industries in the areas of petroleum reserves, capacity, production, refining, and marketing. Tables 2 and 3 show the concentration ratios in 1967 and 1972 for the major industrial sectors and other selected industrial sectors of the United States. In 1972, the concentration ratio for the four largest companies' crude production was 29.4 percent, for refining 31.0 percent, and for gasoline sales 29.0 percent. In the same year, the concentration ratio for the eight largest companies for crude production was 46.9 percent, for refining 56.0 percent, and for gasoline sales 51.6 percent. In 1972, the concentration ratios for major industrial sectors of the U.S. ranged from 31 to 93 percent for the four largest companies in a particular industry and from 44 to 100 percent for the eight largest companies in an industry. It is evident from these figures that the divestiture proponents' argument that the oil industry must be dismembered because of excessive concentration doesn't hold water. The facts demonstrate that the petroleum industry is much less concentrated than most nonenergy industries. In his testimony before the Committee on the Judiciary, Thomas Kauper, then Assistant Attorney General, Antitrust Division, testified that "[t]he petroleum industry appears to be one of the least concentrated of our nation's major industries."[30]

26. *Id.*

27. *Hearings on S. 2387, supra* note 22, pt. 3, at 2096 (1976) (testimony of William Johnson).

28. W. JOHNSON, R. MESSICK, S. VAN VACTOR & F. WYANT, COMPETITION IN THE OIL INDUSTRY 1 (1976) [hereinafter cited as JOHNSON].

29. *Id.* at 2.

30. SENATE COMM. ON THE JUDICIARY, MINORITY VIEWS AND ADDITIONAL VIEWS ON S. 2387,

TABLE 1[31]

CONCENTRATION RATIOS FOR MAJOR SECTORS OF THE ENERGY INDUSTRY OF THE UNITED STATES

Sector	Percentage Accounted for by the Largest 4 Companies	Percentage Accounted for by the Largest 8 Companies
Crude Oil Reserves		
1970	37.2	63.9
Crude Oil Production		
1955	18.8	31.1
1970	30.5	50.1
1972	29.4*	46.9*
Total Crude Oil and Natural Gas Liquids Production		
1972	28.8*	45.8*
Petroleum Refining		
1955	32.8**	57.5**
1972	31.0**	56.0**
Gasoline Sales		
1954	31.2	54.0
1972	29.0	51.6
Natural Gas Sales (interstate)		
1955	23.0	35.0
1971	25.3	42.8
Lubricating Oils and Greases		
1957	38.0**	50.0**
1972	31.0**	44.0**
Uranium Mining and Milling Capacity		
1971	54.4***	78.5***
Coal Production		
1955	16.5	24.0
1972	30.4	40.4

*MOODY'S INDUSTRIAL MANUAL, *Petroleum Engineer*, and U.S. Bureau of Mines.

**BUREAU OF THE CENSUS, DEP'T OF COMMERCE, 1957 AND 1972 CENSUS OF MANUFACTURERS: CONCENTRATION RATIOS IN MANUFACTURING.

***ATOMIC ENERGY COMMISSION, THE NUCLEAR INDUSTRY 20 (1971).

S. REP. No. 1005, 94th Cong., 2d Sess., pt. 2, at 208 (1976) (remarks of Thomas Kauper) [hereinafter cited as SENATE MINORITY REPORT].

31. JOHNSON, *supra* note 28, at 3. (Data collected from T. DUCNESNEAU, COMPETITION IN THE ENERGY INDUSTRY (1975).

TABLE 2[32]

CONCENTRATION RATIOS FOR MAJOR INDUSTRIAL SECTORS OF THE UNITED STATES

Sector	Percentage of Value of Shipments Accounted for by the Largest 4 Companies		Percentage of Value of Shipments Accounted for by the Largest 8 Companies	
	1967	1972	1967	1972
Primary Aluminum	d	79	100	92
Flat Glass	94	92	98	d
Motor Vehicles	92	93	98	99
Primary Copper	77	72	98	100
Tires and Inner Tubes	70	73	88	90
Aircraft	69	66	89	86
Industrial Gases	67	65	84	81
Alkalines and Chlorine	63	72	88	91
Synthetic Rubber	61	62	82	81
Blast Furnaces and Steel Mills	48	44	66	65
Industrial Trucks and Tractors	48	50	62	66
Semiconductors	47	57	65	70
Weaving Mills (synthetic)	46	39	54	54
Ship Building and Repairing	42	47	59	63
Construction Machinery	41	43	53	54
Lubricating Oils and Greases	38	31	50	44
Fertilizers	35	35	55	53
Petroleum Refining	33	31	57	56
Weaving Mills (cotton)	30	31	48	48

d. The government withholds these data to avoid disclosing information about individual companies.

Professor J.S. Bain, a respected specialist in industrial organization, has suggested the standards found in Table 4 for determining the level of concentration in manufacturing industries. These standards indicate that the concentration in the oil industry should be classified as low in the four-firm category and moderately low in the eight-firm category. It is noteworthy that while it is the standard practice for economists to utilize four-firm and eight-firm groupings in measuring concentration ratios, the critics of the petroleum industry who propose the radical measure of divestiture are forced to point to an eighteen-firm grouping.

32. *Id.* at 4. (Source: BUREAU OF THE CENSUS: DEP'T OF COMMERCE, 1957 AND 1972 CENSUS OF MANUFACTURERS: CONCENTRATION RATIOS IN MANUFACTURING.)

TABLE 3[33]

CONCENTRATION RATIOS FOR OTHER SELECTED INDUSTRIAL SECTORS OF THE UNITED STATES

Sector	Percentage of Value of Shipments Accounted for by the Largest 4 Companies		Percentage of Value of Shipments Accounted for by the Largest 8 Companies	
	1967	1972	1967	1972
Electric Tubes (Receiving)	94	95	99	99
Electric Lamps	91	90	95	94
Hard Surface Floor Coverings	89	90	99	98
Turbines and Turbine Generators	76	90	82	96
Chewing Gum	86	87	96	98
Primary Batteries	85	92	95	97
Cathode Ray Picture Tubes	84	83	98	97
Cigarettes	81	84	100	100
Typewriters	81	d	99	d
Sewing Machines	81	84	92	92
Gypsum Products	80	80	93	93
Chocolate and Cocoa Products	77	74	89	88
Household Vacuum Cleaners	76	75	94	91
Woven Carpets and Rugs	76	78	93	91
Electrometallurgical Products	74	74	90	90
Medicinals and Botanicals	74	59	81	75
Household Refrigerators and Freezers	73	85	94	98
Metal Cans	73	66	84	79
Mineral Wool	71	75	84	89
Electron Tubes (Transmitting)	70	55	87	80
Soap and Other Detergents	70	62	78	74
Photographic Equipment and Supplies	69	74	81	85
Cutlery	69	55	77	67
Explosives	67	67	91	86
Greeting Card Publishing	67	70	79	78
Beet Sugar	66	66	96	96
Transformers	65	59	78	75
Thread Mills	62	62	81	77
X-Ray Apparatus and Tubes	62	54	77	75
Storage Batteries	61	57	83	85
Glass Containers	60	55	75	76
Primary Zinc	50	66	90	d
Phonograph Records	58	48	67	61
Soybean Oil Mills	55	54	76	69
Ball and Roller Bearings	54	53	73	73
Knitting Mills	54	52	71	67
Distilled Liquor (Except Brandy)	54	47	71	73
Ceramic Wall and Floor Tile	52	56	76	71

(*Continued*)

33. *Id.* at 5-6. (Source: BUREAU OF THE CENSUS: DEP'T OF COMMERCE, 1957 AND 1972 CENSUS OF MANUFACTURERS. CONCENTRATION RATIOS IN MANUFACTURING.)

Commercial Laundry Equipment	51	53	63	65
Radio and TV Receiving Sets	49	49	69	71
Sanitary Food Containers	49	46	68	64
Printing Ink	49	39	64	54
Wines, Brandy, and Brandy Spirits	48	53	63	68
Motors and Generators	48	47	60	59
Abrasive Products	48	49	57	60
Pulp Mills	45	59	70	83
Cheese	44	42	51	53
Raw Cane Sugar	43	44	65	62
Cottonseed Oil Mills	42	43	60	61
Copper Rolling and Drawing	41	39	65	61
Metal Office Furniture	38	42	52	54

d. The government withholds these data to avoid disclosing information about individual companies.

TABLE 4[34]

Four-Firm Percent of Market	Eight-Firm Percent of Market	Degree of Concentration
75% or more	90% or more	Very high
65 - 75%	85 - 90%	High
50 - 65%	70 - 85%	Moderately high
35 - 50%	45 - 70%	Moderately low
Under 35%	Under 45%	Low

(2) Joint Ventures

Since the empirical evidence shows that the petroleum industry is not highly concentrated, the proponents of divestiture contend that numerous joint ventures and exchange agreements utilized in the oil business must be considered along with concentration ratios. They assert that these agreements are anticompetitive because they make it possible for the companies involved in joint ventures to obtain information on the intentions and capabilities of each other.[35]

Joint ventures frequently are used in the petroleum industry in the exploration, production, and pipeline functions. The real reason for joint ventures in exploration, production, and pipelines is not to suppress competition but to share the high risks of exploring new geologic areas and to finance projects that would be too costly for most companies, even of giant size, to finance individually. Walter Mead lists four basic justifications for joint venture operations:

34. *Hearings on S. 2387, supra* note 22, pt. 3, at 2230 (1976) (statement of Neil Jacoby).
35. *Id.* pt. 1, at 211 (1975) (statement of Congressman Stanton).

1. They permit entry into an industry or activity where absolute capital requirements are so high that only a few large firms could otherwise participate.

2. Risks may be so great that only a few, if any, existing firms would be willing to participate on their own.

3. Separate operations by competing firms may be economically inefficient.

4. In certain uses, large investments may produce external economies that will accrue to all firms regardless of their participation in the initial undertaking.[36]

In testimony before the Senate Subcommittee on Antitrust and Monopoly, Max Eliason, President of the Rocky Mountain Oil and Gas Association and Senior Vice President and General Counsel of Skyline Oil Company, said that in the absence of joint ventures

> [t]he financing of large projects, such as the development of the frontier areas of the Alaskan North Slope and the Outer Continental Shelf and the construction of facilities to produce oil and gas from oil shale and coal, would be much more difficult and perhaps impossible. The magnitude of these projects and the risks involved have placed a severe strain on the financial abilities of even the largest oil companies. They are beyond the financial capabilities of smaller companies. . . .[37]

In the exploration and production areas of the industry, the benefits of joint ventures are substantial since they allow the enormous expenses and risks involved in obtaining and developing offshore leases to be shared. This permits more and smaller companies to participate in and profit from this phase of the industry. In a study of the competitive effects of joint ventures in the bidding for tracts in Outer Continental Shelf offshore lease sales, Edward Erickson and Robert Spann concluded:

> Joint ventures have acted as a risk-sharing device and probably facilitated the entry of small and medium sized firms which otherwise might not have entered OCS auction markets.[38]

Joint pipeline agreements are also prevalent in the petroleum industry. There are 103 interstate pipelines in the United States of which approximately sixty-five are joint ventures. Proponents of divestiture argue that joint pipelines are anticompetitive because

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36. Mead, *The Competitive Significance of Joint Ventures*, 12 ANTITRUST BULL. 819, 824-25 (1976).

37. *Hearings on S. 2387, supra* note 22, pt. 3, at 1844 (1976) (statement of Max Eliason).

38. E. Erickson & R. Spann, An Analysis of the Competitive Effects of Joint Ventures in the Bidding for Tracts in OCS Offshore Lease Sales, Feb. 1974 (unpublished paper available through American Petroleum Institute).

they constitute a "barrier" to market entry. This is an argument without merit. A study of the Colonial pipeline, a large jointly owned pipeline running from Houston to New York, showed that rather than erecting barriers to entry into a market area, jointly owned pipeline enables nonowners to reach new markets at lower cost to the consumer. Professor Mitchell of the University of Michigan, who conducted the study, concluded:

> [O]n the basis of my studies thus far . . . the pattern of gasoline prices and gasoline market shares are consistent with the working of the normal processes of competition and inconsistent with the existence of a cartel of Colonial pipeline owners or of "major" oil companies.[39]

The classification of interstate pipelines as common carriers subject to the rules of the Interstate Commerce Commission mandates the transportation of oil brought to them from any source at fair and reasonable rates.[40] They are precluded by law from giving rebates or engaging in other forms of discrimination.[41]

In his testimony before Congress, Chairman George Stafford of the ICC stated:

> Today there are so few complaints and so few problems that I must say [the pipelines are] one of the best run transportation systems we have. . . . In conclusion, it would appear that except for certain impediments brought about because of environmental considerations, pipelines have been constructed on an as-needed basis and generally provide good service. It has been our experience that pipeline rates are just and reasonable. . . . We have received no complaints in recent years involving allegations relative to the size of tender, the failure to publish through routes and joint rates, or to provide service to independents.[42]

(3) Exchange Agreements

A common practice of the petroleum industry, criticized by the divestiture proponents as inherently anticompetitive, is the exchange agreement. Industry critics allege that these agreements deny independent refiners access to crude oil and facilitate a means of avoiding open market sales which result in increased costs to consumers. In reality, exchange agreements are a unique device used by the industry to promote efficiency in the complex logistics of delivering petroleum products throughout the nation. Without such arrangements, the costs to consumers would be substantially

39. *Hearings on S. 1167, supra* note 10, pt. 8, at 6072 (1974).

40. 49 U.S.C. §§ 41-43 (1970).

41. 49 U.S.C. §§ 1, 6, 15, 20, 41 (1970).

42. *Hearings on Marketing Performance and Competition in the Oil Industry Before Special Subcomm. on Integrated Oil Operations of the Senate Interior Comm.*, 93d Cong., 1st Sess., pt. 3, at 896 (1973) (statement of George Stafford).

higher. There is no proof that exchanges are anticompetitive.

Exchange agreements enable a supplier of crude oil or refined product to trade crude or product located in one section of the country for crude or product located in a different area. These agreements, negotiated at arms-length, enable the companies to compete vigorously across the country through lower transportation costs that are translated ultimately into lower costs to the consumer. In testimony before the Senate Subcommittee on Antitrust and Monopoly, Neil Jacoby of the Graduate School of Management at UCLA stated:

> In my judgment, [exchange agreements] are not anticompetitive features of the industry. They are ways in which integrated companies and nonintegrated firms, too, can obtain the kinds of crude oil that they want for their refineries that they have available to refine it at less cost than if the exchanges were prohibited. They are, in short, not anticompetitive, but operate to increase the overall efficiency of the industry and to help keep down the prices of petroleum products.[43]

Not only are exchange agreements not anticompetitive but indications are that they are beneficial to the independent oil companies since a large percentage of the exchange agreements are between the majors and the independents. The courts have addressed this very subject on several occasions and have concluded that exchange agreements facilitate rather than stifle competition. In *United States v. Standard Oil Co. (Indiana),*[44] the court noted:

> Exchange agreements have been used to aid the independents in securing unbranded regular grade gasoline . . . and permit one refiner of gasoline to do business in the backyard of its competitor's refinery by the exchange of manufactured products.[45]

(4) Profits

Certainly one of the most specious arguments of the divestiture proponents is that the high profit levels earned by the petroleum industry from the third quarter of 1973 to the third quarter of 1974 indicates the existence of monopoly power in the industry. Professor Edward Mitchell, a recognized authority on the subject of economics in the petroleum industry, has addressed this subject:

> [T]he connection between monopoly and profits is a highly qualified one. Perhaps the strongest statement that can be made is that the persistence of

43. *Hearings on S. 2387, supra* note 22, pt. 3, at 2245 (1976) (statement of Neil Jacoby).
44. SENATE MINORITY REPORT, *supra* note 30, at 211.
45. *Id.*

> abnormally high profits over long periods of time in a particular industry make it more likely that the industry is monopolistic than competitive.[46]

It is quite misleading to base a charge of monopoly power on a short-term profit realization given the fact that long-term profitability is the test of monopolistic power. When discussing the short-term oil industry profits in 1973-1974, it is important to understand the reasons for the high profits of the industry immediately following the Arab embargo:

> [M]ost of the increase in profits of the large integrated oil companies have resulted from a substantial increase in the value of inventories held by the companies. This, in turn, was caused by inflation, devaluation of the dollar and the OPEC price hikes. However, when these inventories are replaced at now higher prices the inventory profits will disappear. Likewise, when the dollar was devalued in 1973, those oil companies with foreign assets realized a further accounting profit. All real property and cash denominated in a foreign currency was immediately worth more in dollars. What is significant about these accounting gains is that they were due to non-recurring events.[47]

The increases in profits following the embargo were abnormal. That abnormality is demonstrated by the decline in oil company profits since mid-1974, as shown by Table 5, as well as by the profitability picture for periods preceding the embargo, as shown in Tables 6 and 7. The empirical evidence would seem to indicate that the proponents of divestiture have raised the issue of high short-term, post-embargo profits for the purpose of an emotional appeal. It is an argument without merit.

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46. E. MITCHELL, U.S. ENERGY POLICY: A PRIMER 90 (1974).
47. JOHNSON, *supra* note 28, at 100, 105.

TABLE 5[48]

NET PROFITS OF LEADING U. S. OIL COMPANIES
(Percentage Change from the Same Quarter During the Previous Year)

Company	4th Quarter 1973	1st Quarter 1974	2nd Quarter 1974	3rd Quarter 1974	4th Quarter 1974	1st Quarter 1975	2nd Quarter 1975	3rd Quarter 1975
Exxon	59.0	38.8	66.7	25.4	–1.1	–11.4	–34.3	–31.2
Texaco	70.1	123.2	72.1	23.1	–29.5	–66.0	–52.2	–37.9
Mobil	68.2	65.9	99.5	20.2	–51.0	–28.0	–46.7	–16.8
Gulf	98.3	75.7	28.2	31.0	–19.6	–32.8	–49.2	–36.3
Socal	94.2	91.5	56.6	32.6	3.5	8.3	–22.5	–32.7
Amoco	52.7	81.0	130.8	101.3	43.9	–33.2	–17.1	–28.1
Tenneco	14.4	57.2	—	37.8	–5.5	–13.1	—	—
Arco	47.4	86.7	104.3	140.9	5.7	–28.1	–49.6	–31.8
Shell	–1.5	51.9	39.1	158.4	99.3	–14.3	–5.2	–26.0
Continental	91.6	129.9	106.2	121.8	–30.8	65.2	–17.3	–38.1
Sun	59.6	84.8	163.0	84.5	–28.0	–63.3	–58.2	–30.2
Phillips	127.6	86.4	166.8	109.6	–2.5	–49.6	–10.2	–35.9
Union	55.5	90.7	98.0	57.6	8.8	–45.1	–47.2	2.8
Occidental	—	717.6	292.8	297.3	—	26.3	–45.8	–60.0
Getty	115.0	172.7	167.2	171.9	11.4	–44.3	9.9	–32.3
Cities Service	49.8	87.0	76.4	75.5	10.0	–59.0	–49.8	–7.8
Sohio	–39.9	29.1	18.9	105.6	146.6	–1.8	1.6	–12.0
Amerada Hess	471.9	35.8	38.0	–12.9	–35.1	–44.6	–27.1	–24.3
Marathon	92.8	52.5	147.2	49.9	–27.6	–47.0	–35.0	–31.3
Pennzoil	68.4	110.7	95.0	80.3	—	–12.4	–18.6	–3.2
Ashland	52.2	22.0	44.5	14.2	12.2	12.8	–7.3	12.4
Kerr-McGee	—	98.9	96.4	143.7	65.3	102.3	1.1	–2.6
Murphy	181.0	232.7	52.8	–19.7	–6.8	–40.9	–52.0	–46.4
Skelly	31.3	97.0	198.9	280.0	111.3	–13.7	–1.5	–20.2
Superior	—	208.5	—	—	—	—	—	—
American Petrofina	218.2	176.3	—	247.6	34.0	–64.8	–50.0	–47.6
Louisiana Land	—	79.1	—	—	—	—	—	—
Clark	140.8	—	10.2	–137.5	–193.8	—	–148.8	—
Apco	—	240.1	—	—	—	—	12.0	—
Commonwealth	—	—	—	–281.3	—	—	—	—
Fina	—	—	205.5	—	—	—	—	—
Mapco	—	50.4	—	—	—	—	—	—
Quaker State	—	47.9	22.4	—	—	—	8.8	—
Tesoro	183.5	—	324.2	—	—	—	—	—
Total of Firms in the Sample:	69.9	78.4	80.2	49.8	–7.7	–29.3	–34.5	–2.94

48. *Id.* at 107-08. (Data from Oil and Gas J., Feb. 18, 1974; May 13, 1974; Aug. 12, 1974; Nov. 11, 1974; Feb. 17, 1975; May 5, 1975; Aug. 11, 1975; Nov. 10, 1975.)

TABLE 6[49]

RETURN ON INVESTED CAPITAL
MANUFACTURING INDUSTRIES

Industry	16-Year Average 1958-73		10-Year Average 1964-73		5-Year Average 1969-73		3-Year Average 1971-73	
	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank
Average, all Manufacturing industries	9.3		9.8		9.4		9.6	
Drugs	16.7	1	17.0	1	17.0	1	16.9	1
Instruments and related products	13.6	2	14.5	2	13.6	2	13.7	2
Motor vehicles and equipment	13.0	3	12.9	3	11.4	4	12.9	3
Tobacco manufacturers	11.8	4	12.0	4	12.0	3	12.3	5
Transportation equipment	11.4	5	11.3	5	9.8	10	10.9	7
Chemicals and allied products	11.0	6	11.1	6	11.1	5	11.6	6
Printing and publishing	10.0	7	10.5	7	10.5	7	10.4	9
PETROLEUM INDUSTRY	10.0	8	10.3	9	10.2	8	10.4	8
Electrical machinery, equipment and supplies	9.7	9	10.0	11	9.5	12	9.6	14
Other machinery	9.6	10	10.4	8	9.7	11	9.8	13
All manufacturing corporations	9.4	11	9.8	12	9.5	13	9.9	11
Basic chemicals	9.3	12	9.3	16	9.0	16	9.6	15
Lumber and wood products except furniture	8.9	13	10.0	10	10.9	6	12.8	4
Food and kindred products	8.8	14	9.3	15	10.0	9	10.0	10
Furniture and fixtures	8.6	15	9.7	13	9.3	15	9.8	12
Rubber and miscellaneous plastic products	8.5	16	8.9	19	8.5	19	9.1	18
Metalworking machinery and equipment	8.4	17	9.5	14	7.5	23	6.4	29
Other fabricated metal products	8.4	18	9.3	17	8.6	18	9.0	19
Stone, clay and glass products	8.3	19	8.3	24	8.3	20	9.3	17
Apparel and other finished products	8.2	20	8.9	18	8.7	17	8.8	20
Miscellaneous manufacturing	8.2	21	8.6	21	8.2	21	8.1	21
Primary nonferrous metals	8.0	22	8.4	23	7.7	22	7.0	25
Alcoholic beverages	7.9	23	8.9	20	9.4	14	9.5	16
Aircraft and parts	7.8	24	8.0	25	6.8	26	7.5	22
Leather and leather products	7.8	25	8.5	22	7.1	25	6.6	27
Paper and allied products	7.6	26	7.8	26	7.5	24	7.4	23
Primary metal industries	7.1	27	7.2	27	6.8	27	6.7	26
Textile mill products	6.6	28	7.2	28	6.6	28	7.1	24
Primary iron and steel	6.4	29	6.4	29	6.1	29	6.5	28

49. *Id.* at 101. (Data from *Hearings on Oil Profits and Their Effect on Small Business and Capital Investment Needs of the Energy Industries Before the Subcomm. on Government Regulation of the Senate Select Comm. on Small Business*, 93d Cong., 2d Sess. 145 (1974) (testimony of Secretary Simon).)

TABLE 7[50]

PROFITABILITY OF VARIOUS U. S. MANUFACTURING INDUSTRIES

	RETURN ON EQUITY			RETURN ON TOTAL CAPITAL		
	5-Year Average (percentage)	Industry Rank	Latest 12 months (percentage)	5-Year Average (percentage)	Industry Rank	Latest 12 months (percentage)
Consumer Goods: Health Care	17.2	1	17.1	15.1	1	14.5
Consumer Goods: Personal	14.5	2	15.8	13.3	2	10.8
Financial	14.3	3	14.0	7.3	23	6.8
Leisure & Education	13.9	4	14.3	10.2	5	10.5
Construction & Drilling	13.1	5	12.9	8.2	15	9.2
Consumer Goods: Food & Drink	12.9	6	13.1	9.5	9	9.8
Distribution: Retailers	12.8	7	12.3	9.7	8	8.9
Banks	12.6	8	12.9	10.9	4	9.9
Utilities: Natural Gas	12.6	8	11.9	6.9	26	6.9
Consumer Goods: Household	12.2	10	12.9	9.2	10	9.7
Distribution Wholesalers	12.1	11	13.3	10.0	6	9.9
Nonferrous Metals	11.8	12	12.0	8.7	15	9.3
Electronics	11.7	13	13.8	10.0	6	11.3
Insurance	11.7	13	11.5	11.6	3	11.7
Information Processing	11.4	15	11.5	8.8	11	8.9
Multicompanies Conglomerate	11.2	16	13.1	7.7	21	7.8
Utilities: Electric & Telephone	11.1	17	10.9	5.8	27	5.8
Automotive	11.0	18	12.7	8.6	14	9.0

50. *Id.* at 103. (Data from FORBES, Jan. 1, 1974, at 112.)

	RETURN ON EQUITY			RETURN ON TOTAL CAPITAL		
	5-Year Average (percentage)	Industry Rank	Latest 12 months (percentage)	5-Year Average (percentage)	Industry Rank	Latest 12 months (percentage)
INDUSTRY MEDIAN	11.4		12.8	8.2		9.0
INDUSTRY AVERAGE	11.3		12.2	8.5		8.7
ENERGY	11.0	18	13.0	8.2	15	9.3
Industrial Equipment	11.0	18	12.1	7.8	19	8.3
Aerospace & Defense	10.9	21	10.9	7.7	21	7.1
Building Materials	10.7	22	13.3	8.8	11	10.3
Chemicals	10.5	23	12.8	7.8	19	8.4
Distribution: Supermarkets	10.4	24	8.1	7.9	17	5.8
Consumer Goods: Apparel	9.6	25	10.5	7.2	24	8.2
Multicompanies; Multi-Industry	9.5	26	11.5	7.9	17	9.2
Forest Products & Packaging	9.4	27	12.9	7.1	25	8.1
Steel	6.1	28	9.0	5.1	28	6.5
Transportation: Surface	5.4	29	7.4	4.7	29	4.9
Transportation: Airlines	4.8	30	9.6	3.1	30	5.2

(5) Barriers to Entry

Another method of measuring monopoly power is the ease with which newcomers may enter an industry. It is the contention of the proponents of divestiture that barriers to entry exist at various levels of the petroleum industry, which indicates the exercise of monopoly power by the majors. There are barriers to entry in some functions of the industry, but they are not the result of monopolistic behavior by the oil companies. Dismembering the petroleum companies will not reduce in any way the approximately 300 million dollar cost of constructing a modern, efficient refinery. Nor will divestiture reduce the huge risks and costs involved in offshore or arctic exploration and production. Despite these high risks and financial burdens, some 132 different firms have participated in winning bids in the thirty-three Outer Continental Shelf sales between 1954 and 1974.[51]

Refining is the phase of the industry upon which the divestiture proponents have focused their attack on ease of entry. They argue that the majors have erected and maintained barriers to entry into refining. To support their position they have relied upon a study by Professors Allvine and Patterson which states:

> Since 1950 the integrated oil companies have taken over several of the important independent refineries and there have been built no new independent refineries with over 50,000 barrel per day capacity.[52]

In testimony before the Senate Subcommittee on Antitrust Monopoly, Donald C. O'Hara, President of the National Petroleum Refiners Association, pointed out that the proponents' argument is based on erroneous information:

> In fact, the following new refineries with a capacity of 50,000 barrels per day or more have been built by independent companies since 1950:

Company		b/d capacity
Amerada Hess	St. Croix, V.I.	700,000
Commonwealth	Puerto Rico	161,000
Koch Industries	St. Paul, Minn.	109,800
Amerada Hess	Perth Amboy, N.J.	67,900
Hawaiian Independent	Honolulu, Hawaii	60,000
United Refining	Warren, Pa.	58,000
ECOL	New Orleans, La.	200,000 (under construction)

51. *Id.* at 91.

52. F. ALLVINE & J. PATTERSON, HIGHWAY ROBBERY: AN ANALYSIS OF THE GASOLINE CRISIS 216 (1974).

> In addition, fifteen other independent companies have each built 50,000 barrels per day or more of new capacity since 1950, either by adding to existing refineries or by building on a site previously occupied by an older refinery. This means that actually the equivalent of twenty-two additional refineries of 50,000 barrels per day or more have been built by independent companies since 1950.[53]

Today capital requirements to build a refinery are extremely high. New refineries cost anywhere from 2,000 to 2,500 dollars per barrel per day of capacity.[54]

In addition to the high capital cost element, other significant barriers to entry are environmental restrictions. Would-be entrants find it very difficult to obtain the necessary permits due to heavy opposition by environmental groups. Indeed,

> sixteen independent companies have tried unsuccessfully to get building permits to build refineries on the East Coast. . . . The chief obstacle to the entry of new independent refineries in the refining business has been the objection of the local communities.[55]

High risks, huge capital requirements, and environmental rules constitute real "barriers" to entry into the petroleum business. These barriers have not been created by the oil companies. Divestiture will reduce neither the risks nor the capital requirements, nor the desire to improve the environment. Those same barriers will exist even though the oil companies are segmented into bits and pieces.

In fact, divestiture itself would establish insurmountable new barriers preventing entry by the most likely prospects. For example, successful crude producers would be prohibited from going into refining and prosperous refiners would be barred from entering exploration and production. Thus those most apt to want to enter the business and who would have the means to do so would be banned by legislated divestiture.

B. International Implications of Divestiture

The argument by divestiture proponents that the dismembering of the American oil industry will weaken OPEC would seem to present a real test of credulity. In recent hearings on industrial reorganization, Frank Zarb, Administrator of the Federal Energy Administration, aptly summed up the position of economic schol-

53. *Hearings on S. 2387, supra* note 22, pt. 1, at 386 (1975) (statement of Donald O'Hara).

54. J. HASS, E. MITCHELL & B. STONE, FINANCING THE ENERGY INDUSTRY 32 (1974).

55. *Hearings on S. 2387, supra* note 22, pt. 1, at 387 (1975) (statement of Donald O'Hara).

ars, oil company witnesses, and representatives of the administration:

> There is also no evidence that U.S. petroleum companies, weakened and reduced in size by divestiture, could bargain with the OPEC cartel more efficiently than the larger, vertically integrated firms, and thereby bring more secure supplies at lower prices. OPEC's control of prices results from the cartel's ability to limit production to the level of demand at the price set by the cartel, and to maintain surplus production capacity within its membership. Since vertical divestiture will not favorably affect the supply and demand outlook for OPEC oil, it will not weaken OPEC's control over prices. The prorationing of production among OPEC members could become a severe problem for the OPEC cartel only if faced with a long-term declining market. Therefore, the only way the United States might exert downward pressure on the world price of oil is to create alternative domestic sources of supply and reduce demand for imports.[56]

The statement that the companies are not aggressive purchasers is directly refuted by the events that took place after OPEC's 1974 price formula change. Those events show that as a result of aggressive "shopping" by the oil companies seeking to purchase crude, Libya, Abu Dhabi, Algeria, and several other countries made a series of price cuts to make their crude more competitive:[57]

> By July 1975, price shaving among certain OPEC countries had become so widespread that Algeria was driven to criticize publicly "unjustified" price cuts by Nigeria, Iraq and Libya.[58]

The claim that domestic companies have been serving as a prorationing agent for OPEC is also untenable:

> With respect to the asserted prorationing, one should consider the period between the first quarter of 1974, when OPEC production reached a post-embargo high level, and the February to April period of 1975 when it reached a low. Total OPEC production fell 19 percent over the period. Iraqi production rose 20 percent, however, and Libyan output declined 42 percent. Algeria and Nigeria, both urgently in need of foreign exchange, had cuts in production of 20 percent and 26 percent, respectively, while Qatar's production fell only 9 percent. These changes reflect the fact that the oil companies were aggressively shopping around for lower-priced oil rather than fostering any prorationing scheme for the benefit of exporting nations.[59]

Dismantling the American oil companies will mean simply that their important role in world petroleum logistics will be taken over by the large integrated foreign companies like British Petroleum,

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56. SENATE MINORITY REPORT, *supra* note 30, at 199.

57. W. Johnson & R. Messick, The International Implications of the Vertical Divestiture of U.S. Oil Companies, May 25, 1976, at 13-14 (unpublished paper of Energy Policy Research Project at George Washington University) (copy available through American Petroleum Institute).

58. *Id.* at 14.

59. SENATE MINORITY REPORT, *supra* note 30, at 200.

Royal Dutch Shell, E.N.I., Compagnie Francaise des Petroles, and Mitsubishi Oil Company, Ltd. It is ironic that at a time when foreign governments such as Japan, Canada, France, and Great Britain are encouraging vertical integration, the Congress of the United States is seriously considering breaking asunder the very American companies which pioneered the world petroleum business.

IV. The Consequences of Divestiture

A. *Increased Operating Costs*

Vertical integration clearly permits firms to realize important economies in the production of petroleum and petroleum products. This means that after the break up is implemented (and there is no doubt the transition period will be protracted and turbulent), the price level for petroleum will be higher. There are several reasons why the price level will rise.

First, former intra-firm exchanges will become inter-firm in nature; management and administrative staffs necessarily will be duplicated. Forced to place greater reliance on intermediate markets, the industry also will have to expend additional resources searching for information on transaction opportunities and communicating between firms to arrange and conclude buyer-seller agreements. Each disintegrated unit will look to maximize its own welfare by improving its bargaining position relative to its suppliers and customers; therefore, each will devote resources to achieving an edge in negotiating skill and to obtaining and interpreting market data.[60] Costs of enforcing agreements with other firms will also rise, as will the costs of adjusting to unanticipated variations in contracted prices, quantities, and qualities. Taken together, these added transaction costs simply will increase the domestic costs of producing petroleum and its derivatives.

Dismemberment also would result in the loss of some present technological economies that large-scale operations allow. Specifically, the increasing uncertainty surrounding the availability of crude supplies and market outlets would make companies averse to committing the enormous sums required to finance large-scale refinery and pipeline ventures. Refineries and pipelines built after divestiture therefore probably would be at smaller capacities than

60. As Mitchell notes, the costs firms incur in trying to improve their negotiating skill and in "haggling" with their counterparts are wasteful. What one firm gains in the process, the other loses. Accordingly, the two firms collectively, as well as society as a whole, suffer a net loss of scarce resources. Mitchell, *supra* note 14, at 76.

otherwise would have been the case absent divestiture. If so built, they would be less efficient; consequently, society would be denied opportunities to benefit from lower unit production costs that economies of size bring to these industry sectors.

Furthermore, divestiture would effectively limit the opportunities for asset diversification available to petroleum companies, and thus would affect their ability to attract capital. As indicated earlier, investors perceive the future income stream of a vertically integrated oil company because of the former's asset diversification and the imperfect correlation of profits between industry sectors. In effect, earnings fluctuations in production, refining, transportation, and marketing tend to cancel out within a vertically integrated firm in much the same way that fluctuations in returns on individual securities cancel out in a portfolio. Consequently, the integrated company represents a less risky investment and is rewarded, in sorts, by the investment community with a lower cost of capital.[61]

Divestiture, by destroying the asset diversification gained by integration, will heighten the uncertainties and reduce the attractiveness of investment in each of the divested parts of the formerly integrated companies. The cost of capital to each divested part will rise relative to the cost of capital it would have enjoyed as part of an integrated, diversified whole. For thirteen of the larger petroleum companies, the increase in capital costs resulting from a break-up of their vertical structures has been conservatively estimated to be one billion dollars per year.[62] Investor uncertainties also may be amplified because each divested unit will be an untested firm with new management, new policies and objectives, and no "track record" of its own.[63] For these reasons, capital would tend to flow toward the fragmented companies only at higher costs, necessitating greater revenue needs in each of the divested parts of the industry.

B. Increased Costs for United States Consumers

Unless there are any as yet unforeseen counteracting reductions in costs, divestiture will force domestic firms to raise product prices to offset the added expenses of less efficient organization. Consequently, the domestic consumer ultimately will bear the higher costs of producing, refining, transporting, and marketing petroleum.

61. *See* note 23 *supra.*

62. Mitchell, *supra* note 14, at 100-01.

63. What matters to investors is the prospect of future profitability. For investment purposes, whether a firm has no history to which investors can refer is relevant only to the extent investors draw inferences about the future from the past.

Elementary economics suggests that the magnitude of product price increases will depend upon the lowest cost competitor in the domestic market following divestiture. As a result of the positive economies derived from vertical integration, fully integrated foreign firms will have cost advantages in production over a divested American petroleum industry. Assuming foreign integrated firms are not restricted from the post-divestiture domestic market, prices will rise to domestic petroleum consumers but only to the extent that foreign integrated firms are able to provide products less expensively.

On the other hand, if foreign firms are excluded from operating domestically as integrated entities, consumers probably will pay even higher prices for petroleum goods since United States firms then would be able to pass on divestiture-incurred costs that otherwise would be absorbed internally because of low-cost foreign competition.

At present, it is not clear that if divestiture legislation is enacted, foreign firms will be prohibited from competing in the domestic market on an integrated basis. Nevertheless, on the apparent assumption that domestic companies will be able to pass on to consumers all costs arising from divestiture, it has been estimated recently that on an industry-wide basis divestiture-caused inefficiencies would translate directly into more than five billion dollars in annually recurring costs for American consumers. Aside from the sheer magnitude of these costs, a deadweight loss to society *in toto,* what ought to concern divestiture advocates is the social inequity of the burden to be imposed on different income groups. Particularly hard-hit by the inflationary impact will be those people who can least afford it, especially those on the lower end of the income ladder who spend a relatively larger percentage of their discretionary income on necessary petroleum products.

C. Transition Costs

The divestiture consequences mentioned so far imply greater costs (and therefore higher prices to consumers) after divestiture is effected and equilibrium has been restored in the domestic petroleum industry. There also would be costs, however, associated with the transition from the present organizational structure to the new structure mandated by Congress. Included in these costs would be those incurred in designing and effectuating individual company divestiture plans (for example, the costs of categorizing and separat-

64. *Hearings on S. 2387, supra* note 22, pt. 1, at 341 (1975) (Exxon statement).

ing assets, of selling or otherwise distributing them, and of arranging and establishing new managements), retiring the firm's outstanding debt and equity instruments, and raising capital in an atmosphere of great uncertainty. The magnitude of these costs is unknown, but certainly the constitutionality of divestiture and numerous other legal issues will be litigated in protracted court battles. The extent of these transition costs also will depend on the manner in which individual companies restructure management echelons, the extent to which current debt and equity instruments must be retired and refinanced, and the ability of capital markets to handle refinancing.

To be sure, the cost of completely refinancing outstanding debt would in itself be great. In 1974, the long-term debt burden of Chase Manhattan's "Group" of twenty-nine major petroleum companies (all of whom would be affected in some way by S.2387) amounted to 25.6 billion dollars on which interest (2.5 billion dollars) was paid at a rate of approximately ten percent.[65] Investors willingly purchased bonds bearing this average yield because the firms selling them were integrated and financially sound. Nevertheless, if the broad asset bases of these companies were broken apart and their earnings potential diminished, investors would envision an increase in the probability of default at redemption time.

Under these circumstances, bondholders are certain to demand interest rates in excess of the average ten percent rate at which debt was financed in 1974. Assuming the entire 25.6 billion dollars debt burden of the "Group" had to be refinanced at the moderately higher rate of twelve percent, those companies alone would have to expend collectively an additional 512 million dollars annually on interest charges. This calculation, however, does not account for the growth in the debt level that has occurred since 1974 to finance new capital expenditures. Therefore, to the extent twelve percent is a realistic approximation of the increased average rate at which debt would have to be refinanced,[66] 512 million dollars probably understates the recurring annual increase in interest charges that these companies would have to pay.

65. CHASE MANHATTAN BANK, FINANCIAL ANALYSIS OF A GROUP OF PETROLEUM COMPANIES: 1974, at 30 (Energy Econ. Div. publ. Sept. 1975) [hereinafter cited as CHASE MANHATTAN].

66. Mitchell estimated that the cost of equity capital to disintegrated petroleum companies would rise by 20% over normal as a result of increased risk. Mitchell, *supra* note 14, at 99-101. Assuming interest rates respond to risk in proportion to the response of equity capital costs, 12% is a reasonable estimate of the rate at which debt would be refinanced.

D. *Implications for the Economy and Domestic Energy Development*

It seems certain that during the transition period, with industry forced to focus its resources and full attention on the procedural aspects of complying with divestiture, investment in domestic energy development will not continue to grow at the rapid pace it has in recent years.[67] Further, the added uncertainties surrounding operations in a divested industry will discourage United States petroleum investment beyond the transition period. Without assurances of continued crude oil input or market outlet availability, for example, United States companies are likely to become reluctant to make the large capital expenditures required for new grassroots refinery, refinery expansion, or pipeline projects. Investment in research and development of synthetic fuel from coal also may decline with the fragmentation of the large vertically integrated companies since they have had both the incentive and the resources to conduct R & D activities and now account for the lion's share of R & D-related expenditures.[68]

Even assuming a willingness on the part of firms to make new energy expenditures, limited or more expensive funds will present a bottleneck. Over the next few years the capital market is expected to become extremely tight. For the first time in recent American history, the supply of funds may not grow as quickly as the potential demand for funds.[69] Under these circumstances, capital availability may become a constraint on investment and the capital market may not be able to satisfy all potential demands for capital. Investors will be in a position to pick and choose between investments selecting the best opportunities as they see them. Since divestiture will increase investors' perceptions of risk and their awareness of alternative investment opportunities, investors will be less likely to commit funds to those companies so affected and will be persuaded to do so only at higher rates of return. At higher capital costs, however, many projects will no longer promise attractive returns to the companies and so will not be undertaken.

Nor is it likely that divested firms will realize profit levels high enough to satisfy their capital needs from internally generated

67. Chase Manhattan reports that the domestic capital expenditures of its "Group" of 29 companies rose from $7.6 billion in 1973 to $13.4 billion in 1974, an increase of 76.4%. *See* CHASE MANHATTAN, *supra* note 65, at 19.

68. *Hearings on S. 2387, supra* note 22, pt. 3, at 2236 (1976) (statement of Neil Jacoby); *Id.* pt. 3, at 1844-45 (1976) (statement of Max Eliason).

69. *Hearings on S. 2387, supra* note 22, pt. 3, at 1966 (1976).

funds. Even as presently structured, the industry has relied in recent years more heavily on debt financing as a means of capital formation.[70] Moreover, if foreign integrated firms are able to compete in the United States market and the economies gained from integration allow them to charge prices lower than divested American firms may charge, foreign firms gradually will acquire domestic market shares at the expense of domestic companies and the latter's earnings will suffer. Similarly, because they will face competition from the same foreign companies in international markets, United States firms are likely to be less successful in running overseas operations as well.[71]

Because of the magnitude of the capital expenditures made by the American petroleum industry (13.4 billion dollars in 1974), any curtailment or slowdown in the rate of petroleum investment domestically will have significant negative effects on the nation's economy. One important consequence will be the loss of thousands of jobs for United States citizens. The Congressional Research Service of the Library of Congress estimated that divestiture would add from 200,000 to 700,000 members of the American labor force to the 1976 unemployment roll.[72] This figure, however, does not count the indirect effect on employment. Presumably such a large reduction in petroleum capital expenditures, coming as it would during a fragile period of economic recovery, will induce comparable spending cutbacks in other sectors of the economy.

The rate of economic growth also would be affected adversely by a slowdown in business investment. Projections by the Library of Congress indicate that under the foregoing investment scenario there would be a decrease in Gross National Product between 1977 and 1983 totaling 201.7 billion dollars (low estimate) or 351.1 billion dollars (high estimate).[73]

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70. CHASE MANHATTAN, *supra* note 65.

71. If Congress does not require the divestiture of foreign based assets, the international effects may be mitigated somewhat because other governments do not appear at this time to have policy intentions that would ban vertical integration within their borders. In fact, foreign governments have, for the most part, reacted positively to vertical integration. Both Italy and France, for example, have organized their state-owned companies (ENI and ELF ERAP, respectively), on an integrated basis. *See* FEDERAL ENERGY ADMINISTRATION, AN EVALUATION OF THE OPTIONS OF THE U.S. GOVERNMENT IN ITS RELATIONSHIP TO U.S. FIRMS IN INTERNATIONAL PETROLEUM AFFAIRS 29-36 (1975). The Japanese government recently has indicated that it will encourage vertical integration in its domestic petroleum industry. *See Japan Plans to Reorganize Her Troubled Oil Industry*, N.Y. Times, Sept. 8, 1975, at 43, col. 2.

72. Howard Useem, The Impact of Petroleum Divestiture on the U.S. Economy, June 9, 1976, at 26 (unpublished paper of Library of Congress Congressional Research Service) (copy available through American Petroleum Institute).

73. *Id.*

Further, curtailed investment in domestic energy development would jeopardize the nation's ability to pursue steady economic growth over the long run. Empirical studies indicate that energy use has remained constant relative to Gross National Product for a long time.[74] It follows, therefore, that economic growth is closely tied to energy consumption and that dependable supplies of energy are an indispensable requisite to growth. Yet in spite of this truism, the United States has continued to experience a growing gap between domestic energy demand and domestic capacity in energy production that has led to a growing reliance on petroleum imports from politically volatile foreign sources. Today the United States is importing roughly forty percent of its petroleum needs and will be forced to import approximately fifty percent of its needs by 1980, with most of the increase coming from the Middle East and North Africa. Becoming more dependent on insecure foreign supplies, the nation has exposed itself to periodic and potentially harmful economic disruption should those supplies be cut off. The severe impact of the politically motivated Arab oil embargo of 1973-1974 should serve as a reminder of the potential harm that may come from overdependence on foreign energy supplies. Even today, the economic reverberations of that six-month embargo, which interrupted less than one-third of the nation's import requirements,[75] continue to be felt throughout the economy. Should the Arabs impose another six-month embargo on the United States in the next year, estimates are that the projected Gross National Product would decline between 39 and 56 billion dollars accompanied by a loss of 1.5 million jobs.[76]

The upshot is that by discouraging investment in domestic energy development, divestiture would increase American reliance on foreign energy supplies, thereby strengthening the OPEC cartel. Because of the long lead times involved in bringing new energy production capacity on stream, even minor delays in domestic investment could prove costly to the nation. Should energy development be suspended for even as short a period as three years, it has been calculated that domestic energy supplies would be reduced by 2.5 million barrels per day in 1980 and by approximately 4.0 million barrels per day in 1985 vis-a-vis current total domestic

74. *See* CHASE MANHATTAN BANK, HOW MUCH OIL—HOW MUCH INVESTMENT 1, Fig. 1 (Energy Econ. Div. publ. Mar. 1975).

75. *Hearings on S. 1167, supra* note 10, 94th Cong., 1st Sess., pt. 9, at 564 (1975) (statement of Wallace Wilson).

76. *Hearings on S. 2387, supra* note 22, pt. 3, at 1843 (1976) (statement of Max Eliason).

production of 8.2 million barrels per day.[77] Presuming this lost production could be replaced with imported energy supplies, the nation will face an added balance-of-payments drain, in addition to greater economic insecurity. At eleven dollars per barrel, replacement costs would add 10 billion dollars annually to the trade deficit by 1980 and 16 billion dollars annually by 1985.

E. Costs to Stockholders and Bondholders

One other consequence of divestiture is that claimants on the assets of integrated companies will suffer real losses on their investment, contrary to what the proponents of divestiture have argued. By breaking up the integrated oil companies, the low "risk premium" with which they initially attracted capital (by virtue of their diversification, growth rates, and proven capabilities of management) will be lost and replaced by a higher "risk premium" resulting from investor skepticism over the viability of the separated parts. Assuming that complete refinancing of the debt base is undertaken, outstanding debt could be refinanced only at higher interest rates since creditors would demand compensation for the greater uncertainties surrounding petroleum investment. For company stockholders, this would be equivalent to increasing the costs of doing business and thus the value of the company to them, like any asset, will decline. If refinancing of the debt is not required or is limited, the effect on stockholders will be mitigated on this last count, but the value of outstanding bonds will decrease because of the uncertainty of timely redemption. In the former case it is the wealth of the stockholders that will be reduced primarily, and in the latter case that of the bondholders.

Divestiture will have consequences not only for the long-term debt base; other assets owned by stockholders will depreciate in value due, *inter alia,* to the reduction in diversification. Refining or pipeline equity, for example, will be worth less to owners without assured sources of crude supplies, or if such assurance must be purchased more expensively.

Because of the ownership of integrated oil company stocks and bonds by a large portion of the United States population, the reductions in wealth caused by the devaluation of these instruments will have a direct impact on the welfare of millions of Americans.[78] Con-

77. *Hearings on S. 2387, supra* note 22, pt. 1, at 340 (1975) (Exxon statement).

78. Counting only the 6 largest vertically integrated oil companies, there are 14 million direct and indirect (2.3 and 11.7 million, respectively) shareowners. SENATE MINORITY REPORT, *supra* note 30, at 202. This accounts for 6.5% of the total population.

sidering that many of these people have invested directly or indirectly in these securities as a means of providing for future contingencies, college educations, or retirement, divestiture would work many personal financial hardships.

Thus it is apparent that divestiture will impose real costs on society. These costs probably will be heavy. Nevertheless, the costs might be justified if divestiture also provided benefits for society. To be sure, proponents of divestiture argue that there are benefits to be gained. They maintain that market power in the industry would be reduced if vertical integration were banned or limited and that consumers would benefit from the increased competition. It has been shown elsewhere in this article, however, that the domestic petroleum industry is competitive to the extent competition can be measured from indicators of structure and performance. In addition, the economics literature indicates that if conditions or competition exist at successive production stages, integration between those stages will not increase monopoly power horizontally at any of the stages.[79] It follows, then, that divestiture cannot increase competition in the United States petroleum industry.[80] In view of the costs associated with divesting the American petroleum industry and the absence of any other plausible benefit from doing so, divestiture legislation simply cannot be construed as being in the best interest of the nation.

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79. *See* note 2 *supra.*

80. In fact, divestiture may actually reduce competition by increasing concentration horizontally. Jacob writes:

> A little noted but no less important consequence of *vertical disintegration* of the U.S. petroleum industry would be a significant rise in its *horizontal integration* (concentration). A primary motive for vertical integration has been the desire to limit risks. Refiners enter crude oil production to assure a supply of crude, or they acquire service stations to assure marketing outlets for products. Forced vertical disintegration would restore to the smaller single-stage surviving companies the higher level of risk that was reduced by vertical integration. Many of these companies would be unable to survive periods of business adversity. They would suffer bankruptcy or seek mergers to become larger and stronger companies, better able to carry high risks. Horizontal integration is also a device for reducing risk by geographical diversification of markets and extending product lines. Witb foreclosure of vertical integration as a risk-limiting strategy, strong market forces would be created to produce larger and financially stronger firms. After a decade or so, the oil industry might well end up with a *higher level of concentration* at each stage than obtains today. The ironic result of legislation intended to produce smaller firms in tbe petroleum industry might be to enlarge tbeir average size!

Hearings on S. 2387, supra note 22, pt. 3, at 2236 (1976) (statement of Neil Jacoby). *See also* JOHNSON, *supra* note 28, at 53.