

Restructuring: The Changing Face of Motor Gasoline Marketing

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Introduction

The recent increase in petroleum industry mergers and acquisitions and the implementation of environmental regulations during the late 1990's, coupled with recent petroleum product price volatility, have prompted recurring Federal and state regulatory scrutiny of petroleum refining and marketing company operations. In recent years, a number of Energy Information Administration (EIA) studies have examined various questions related to petroleum refining and marketing. Examples include [The Impact of Environmental Compliance Costs on U.S. Refining Profitability](#), [Financial Performance: Low Profitability in U.S. Refining and Marketing](#), and [The U.S. Petroleum Refining and Gasoline Marketing Industry](#). However, these efforts have concentrated on petroleum refining, or on product prices and sales volumes (data that EIA collects), with less attention given to the marketing of motor gasoline through retail outlets.

Motor gasoline marketing may be the most publicly prominent activity of the U.S. majors. [\(Note 1\)](#) In part this may be because motor gasoline is the most widely consumed petroleum product of U.S. households, accounting for more than 40 percent of petroleum products demanded in 1999. [\(Note 2\)](#) Additionally, the U.S. majors [\(Note 3\)](#) make an effort to create brand recognition for their motor gasoline. [\(Note 4\)](#) Thus, changes in motor gasoline prices, especially price increases, tend to gain the public's attention quickly, and elicit responses ranging from inflammatory news articles to Congressional hearings, depending on the circumstances.

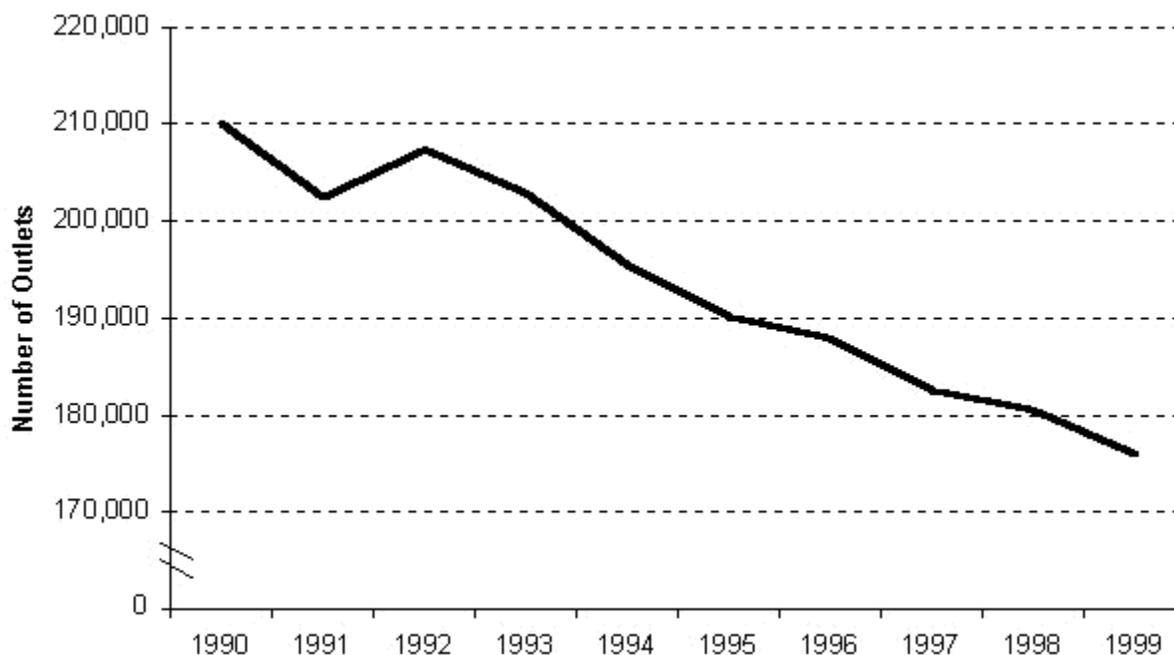
Examination of the data for motor gasoline marketing [\(Note 5\)](#) indicates that the operations of the integrated refiners [\(Note 6\)](#) (a subgroup of the U.S. majors) are becoming more regional in their scope. Alternatively, the operations of the non-integrated refiners [\(Note 7\)](#) (also a subgroup of the U.S. majors) have become more nationwide in their focus. The return on domestic refining and marketing investment of the U.S. majors as a whole increased over the years 1995 through 1999. These trends become more interesting when viewed against the backdrop of the decline of retail outlets over the period.

Marketing Operations of Industry Coalesce

Number of Outlets Declines, But Offset by Greater Outlet Productivity

The motor gasoline marketing industry has consolidated over the last several years as the number of retail outlets declined from 210,120 in 1990 to 175,941 in 2000 [\(Figure 1\)](#). However, the country's population increased over a comparable period, rising from 249.5 million in 1990 to 272.7 million in 1999. [\(Note 8\)](#) The number of per capita outlets declined by 23 percent between 1990 and 1999 [\(Figure 2\)](#). Nonetheless, at the same time, motor gasoline sales increased by 7 percent [\(Figure 3\)](#). The increased sales were achieved through using the remaining outlets more intensely, as indicated by a 28-percent increase in the average monthly sales volume during the 1990's [\(Figure 4\)](#).

Figure 1. U.S. Motor Gasoline Retail Outlets, 1990-1999



Note: Because of the differences in the time periods during which the *National Petroleum News (NPN)* collects retail outlet data from the States and the Energy Information Administration (EIA) collects State-level sales volume data, the *NPN* data are associated with EIA data for the previous year. For example, *NPN* outlet numbers for 1991 are associated with EIA 1990 volume data and all are assigned to 1990.

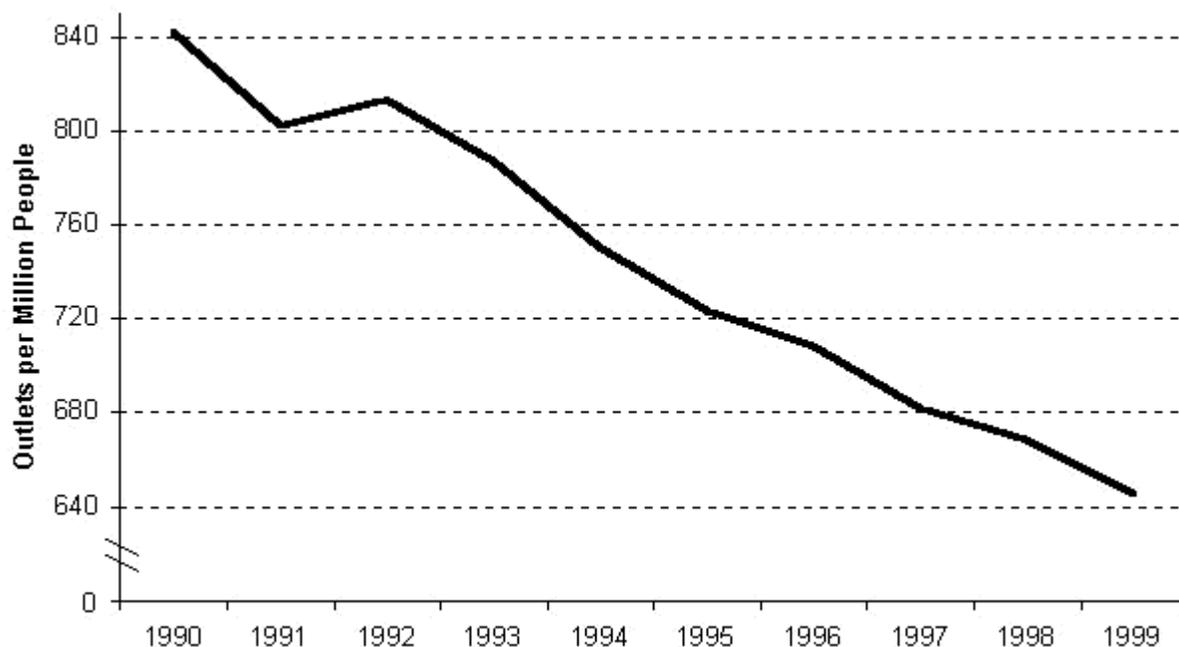
Sources: *National Petroleum News, Market Facts '96* (mid-July 1996), p. 120; and *Market Facts 2000* (mid-July 2000), p. 120.

Certainly there are many reasons for the increased intensity in the use of retail outlets, many factors that would motivate actions that would generate this result. Introduction of higher-cost Phase I diesel and motor gasoline in the early 1990's (required by the 1990 Clean Air Act Amendments) tended to increase the costs to retailers. Additionally, underground storage tank requirements that generally became effective at the end of 1998 elevated the costs of those remaining in the industry. (Note 9) These factors tended to squeeze marginal operators, some of whom probably exited the industry. Increases in some retailing costs elicited efforts by retailers to reduce other costs, including using the fixed assets (e.g., the retail outlet and its location) more intensely by shoehorning more goods and services into the outlet and expanding operating hours.

Convenience Store Replaces Service Station As Primary Outlet Format

The traditional service station of the 1940's, 1950's, and 1960's had one or more mechanics on-duty working in one to three service bays and pumping motor gasoline from 2 or 3 islands, each with 3 pumps and 2 nozzles on each pump. (Note 10) The transition from the traditional service station to the convenience store format began during the early 1970's with the rise in the availability of self-serve motor gasoline. (Note 11), (Note 12) The increased dependability and complexity of motor vehicles, especially passenger cars, contributed to the decline in the ability of service stations to sell automobile repair and maintenance services. (Note 13) In turn, this led to the need to replace the revenue streams these activities supplied. Convenience items supply revenue to augment the motor gasoline and lubricants revenue streams retained by the outlets (although some outlets opted just to go out of business).

Figure 2. U.S. Motor Gasoline Outlets per Million People, 1990-1999



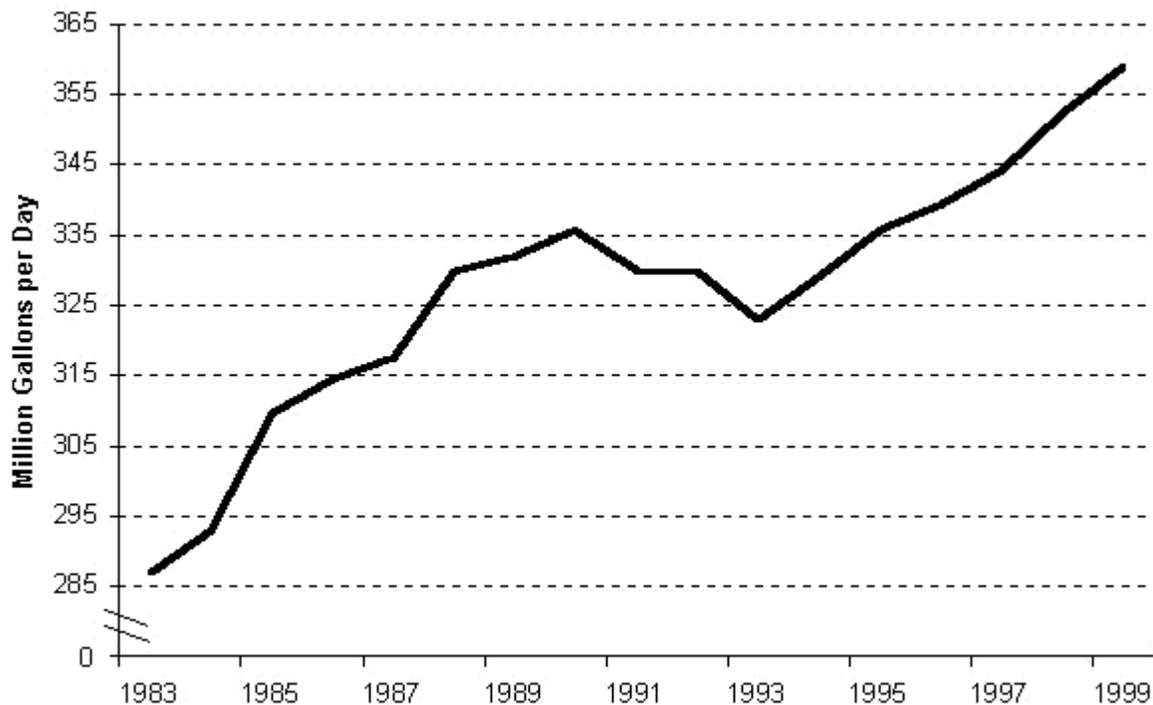
Sources: **Retail outlets:** Collected by *National Petroleum News* from State agencies; **Population estimates:** U.S. Department of Commerce, [U.S. Census Bureau](#), Population Division, Population Estimates Program.

Replacing the traditional station was the convenience store (c-store) format in which items such as soft drinks, coffee, and cigarettes are sold inside a store that is surrounded by many gasoline pump islands. The c-store has evolved further in recent years as branded fast food stores have been combined with the c-store. This combination has expanded the offerings of the outlet by adding nationally- (or regionally-) branded fast food (such as McDonalds, Dairy Queen, Subway, etc.), and automatic teller machines. This is referred to as co-branding or multiple formatting -- i.e., combining a branded motor gasoline outlet with a branded fast food chain outlet. Co-branded/multiple-format outlets were introduced as early as 1987, but were widely embraced by the U.S. majors during the 1990's. For example ARCO, Ashland, Chevron, Exxon, Phillips, Sun, Texaco, Unocal, and USX/Marathon all introduced such outlets during 1995 and 1996. (Note 14) Subsequently, most of the U.S. majors indicated that they, too, had made similar changes in their marketing operations. These changes were intended to broaden the client base and reduce the operational costs of the affected outlets.

The degree to which convenience store operations have grown in importance to the U.S. majors can be approximated, albeit imperfectly, through use of the [Financial Reporting System \(FRS\)](#) financial data collected by EIA. In the FRS data series the data item termed "other refining/marketing revenue" (Note 15) per company-operated outlet (Note 16) can be used as a proxy for the U.S. majors' convenience store sales. During the 1990's the significance of the U.S. majors' convenience item sales grew (between 1990 and 1994), declined (1994 to 1997), and grew again (1997 through 1999), ending the decade at \$859,000, 15-percent higher than the 1990 value of \$745,000 per company-operated outlet (Figure 5). (Note 17)

Motor gasoline retail outlets have noticeably changed in the past decade. The rise of convenience stores, co-branded outlets offering both convenience items and branded fast food, and, lately, hypermarkets, (Note 18) filled the financial void left by the decline in types of automotive services provided by motor gasoline outlets. (These services are now more often provided by quick lubes, tire warehouses, and other specialty retailers.)

Figure 3. Prime Suppliers Deliveries of All Motor Gasoline, 1983-1999



Note: The decline between 1990 and 1993 may be largely attributed to a nationwide recession and the elimination of double-counting arising from product trading. See "Changes to Form EIA-782C, 'Monthly Report of Petroleum Sold into States for Consumption,'" in Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380(93/05) (Washington, DC, May 1993), pp. 3-9.

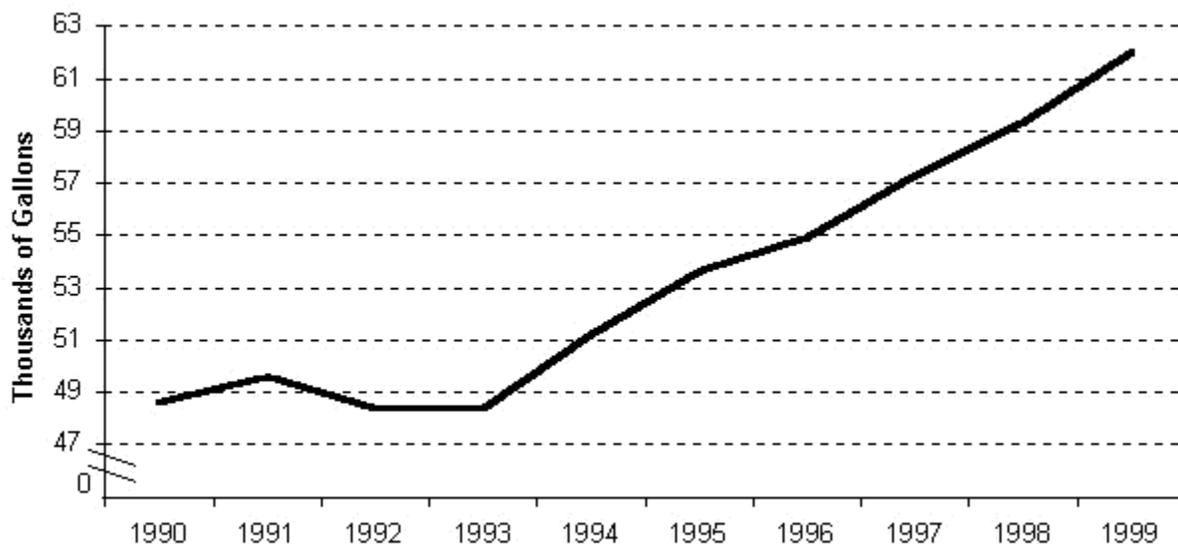
Source: Energy Information Administration, [Form EIA-782C](#) (Monthly Report of Prime Supplier Sales of Petroleum Products Sold for Local Consumption).

Employment, Salaries, and the Value of Outlets All Grow

Convenience items and self-serve motor gasoline grew in importance as repair and maintenance services and full-serve motor gasoline sales diminished in importance. [\(Note 19\)](#) Consequently, more skilled and higher paid mechanics and attendants were supplanted by cashiers, which tend to be lower skill positions with lower wages. The average number of employees per outlet increased nationally during the 1990's, from 6.7 employees in 1990 to 7.6 in 1998, a 14-percent increase [\(Figure 6\)](#). Such a change may be consistent with several hypotheses, including an increase in the number of hours of operation. [\(Note 20\)](#) Convenience stores may tend toward longer operating hours than service stations and these employment data do not contradict that conclusion. [\(Note 21\)](#)

The associated salary data also do not appear to contradict the idea that the increased number of employees is due to longer hours of operation instead of increased use of part-time employees (over approximately the same number of hours of operation). [\(Note 22\)](#) The average annual salary received by employees of motor gasoline outlets increased from \$12,976 in 1990 to \$13,222 in 1998 (both expressed in 1999 dollars). This change may not be inconsistent with an increased use of part-time employees [\(Figure 7\)](#), depending on the direction and degree to which the more general retailing salary changed between 1990 and 1998.

Figure 4. Average Monthly Motor Gasoline Sales Volume per Retail Outlet, 1990-1999



Note: Because of the differences in the time periods during which the *National Petroleum News (NPN)* collects retail outlet data from the States and the Energy Information Administration (EIA) collects State-level sales volume data, the *NPN* data are associated with EIA data for the previous year. For example, *NPN* outlet numbers for 1991 are associated with EIA 1990 volume data and all are assigned to 1990.

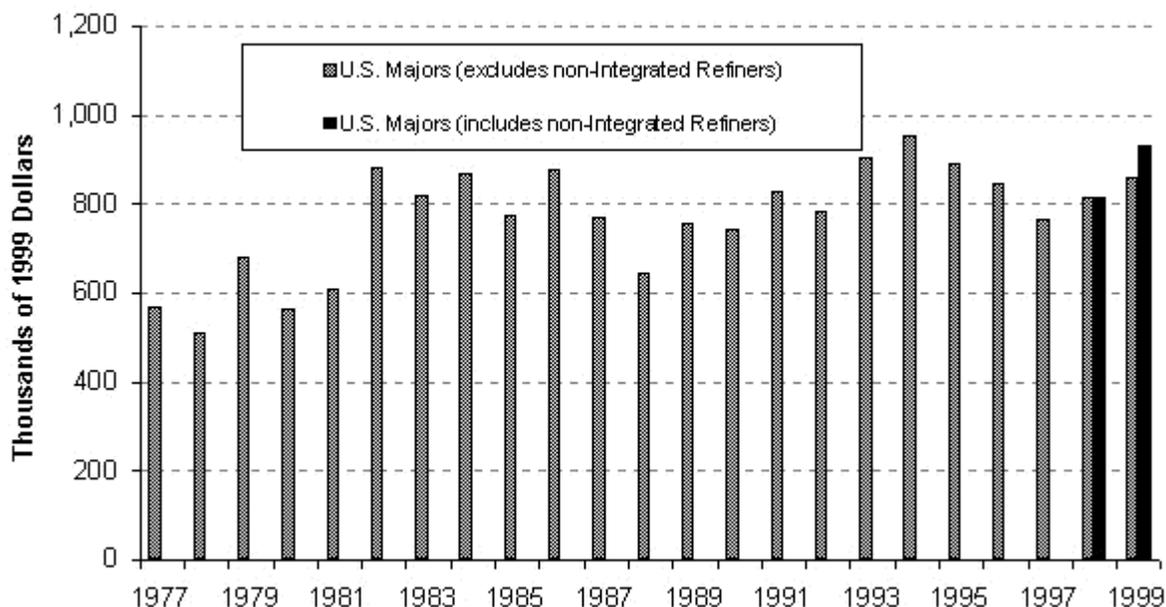
Sources: **Retail outlets:** *NPN, Market Facts '96* (mid-July 1996), p. 120 and *Market Facts 2000* (mid-July 2000), p. 120. **Sales volume:** EIA, *Petroleum Marketing Annual*, DOE/EIA-0487 (Washington, DC, 1990-1999), Table 48.

However, indexing the motor gasoline retail average annual salary (i.e., dividing it by the more general retail average annual salary) tells a slightly different story. The indexed motor gasoline outlet average annual salary slightly declined from 88 percent of the average annual retail salary in 1990 to 86 percent in 1997. (Note 23) Thus, while motor gasoline retail employment increased, salaries seem to have remained relatively unchanged during the 1990's, providing some indication that convenience store-format retail outlets likely have more part-time employees and may also have longer operating hours than those of the format they replaced, the traditional service station. But labor costs may be a target of future cost-cutting efforts in motor gasoline retailing. A recent article in *National Petroleum News* discussed the limited introduction of an in-store scanner that allows customers to scan their purchases and then pay a cashier. A sidebar in the same article discussed the introduction of gasoline clubs that use unattended retail sites. Both of these innovations allow businesses to substitute capital assets for labor, potentially lowering overall costs. (Note 24)

The capital intensity of retail outlets affords a second approach to quantify the changes in motor gasoline outlets over the past decade. The capital intensity of the U.S. majors' retail outlets can be measured by the per-outlet value of net investment in place, which increased from \$500,000 per outlet in 1990 to \$771,000 in 1999 (Figure 8). The 54-percent increase achieved by the majors may be instructive of underlying industry-wide changes. The U.S. majors shed 13 percent of their lessee and company-operated outlets between 1990 and 1999, which fell from 31,553 to 27,612. (Note 25) The average per outlet net investment in place may have increased partially through the divestiture of marginal outlets, which probably tended to be among the smallest outlets (in terms of monthly motor gasoline sales volume, and probably also in terms of capital investment). However the U.S. majors made considerable capital investment in their retailing outlets over the period 1990 to 1999, fluctuating between a low of \$71,538 per outlet in 1993 and a high of \$108,481 per outlet in 1990 (Figure 9) and totaled about \$22 billion over the period.

The increased marketing investment by the U.S. majors accomplished at least two goals during the decade of the 1990's. First, this investment enabled the integrated refiners to meet the underground storage tank requirements of the U.S.

Figure 5. U.S. Majors Gross Other Refining/Marketing Revenue Per Company-Operated Branded Retail Outlet, 1977-1999



Note: Because of the relatively large differences in the organization of the non-integrated refiners and the rest of the U.S. majors, two measures are given for the two years that the non-integrated refiners have been considered U.S. majors by EIA; one without the non-integrated refiners (grey) and one with the non-integrated refiners (black).

Source: Energy Information Administration, Form EIA-28 ([Financial Reporting System](#)).

Environmental Protection Agency. ([Note 26](#)) Second, the investment allowed the U.S. majors to use their existing assets more intensively, as demonstrated by their increased sales volume achieved over the decade. The U.S. majors average motor gasoline sales, which were 31,000 gallons per month in 1981, were 76,000 gallons per month in 1990, but had increased to 100,000 gallons per month by 1999 ([Figure 10](#)).

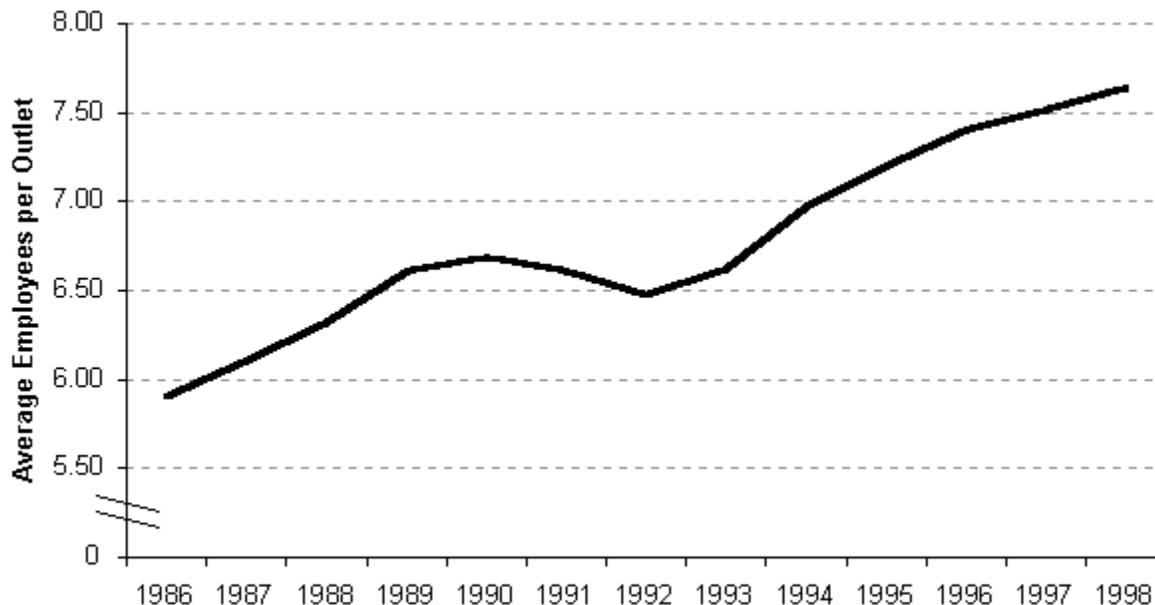
Marketing Operations of Integrated Refiners and Non-Integrated Refiners Converge

Consolidation Characterizes Integrated Refiners' Gasoline Marketing During 1990's

The U.S. majors as a whole play a significant role in petroleum refining, accounting for 86 percent of U.S. crude distillation capacity ([Note 27](#)) and 88 percent of U.S. gasoline production in 1999. ([Note 28](#)) They play a less significant, but still substantial, role in motor gasoline marketing. For example, in 1999 the branded outlets directly supplied motor gasoline by the U.S. majors were 30 percent of total U.S. retail outlets ([Figure 11](#)), but 62 percent of motor gasoline in the United States in 1999 was sold through these branded outlets ([Figure 12](#)).

Throughout the 1990's the integrated refiners sold and acquired assets at a remarkable rate as they attempted to reduce their operating costs by refocusing their efforts on those regions of the country in which they had significant market shares. ([Note 29](#)) Thereby the integrated refiners operated in fewer parts of the country in 1999 than they had in 1990, making their marketing operations less national and more regional in scope.

Figure 6. U.S. Average Number of Employees per Outlet, 1986-1998



Note: These data are collected each year during the week including March 12.

The decline in the average number of employees between 1990 and 1992 is partly due to the economic recession that began during the third quarter of 1990 and ended in early 1992. There also may be some effect arising from the 1992 Economic Census. More data are collected on establishments during Census years than during non-Census years, resulting in some difference in the industry to which a particular establishment is assigned during a Census year relative to non-Census years.

Source: U.S. Department of Commerce, [U.S. Census Bureau, County Business Patterns](#) (1986-1998).

The following chronology indicates the extent to which integrated refiners abandoned some markets, usually without offsetting entry elsewhere, during the 1990's.

1991

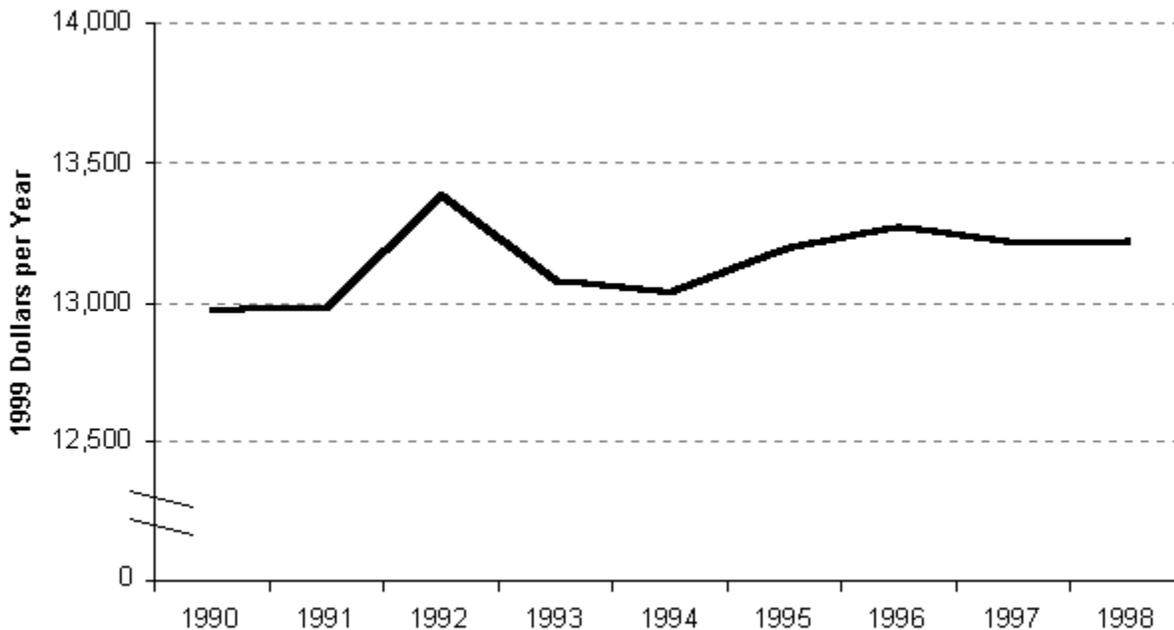
- Total Petroleum sold 20 percent of its outlets to reinvest the sale proceeds in a smaller geographic area.
- Shell Oil sold its Seattle outlets, announced plans to sell its outlets in Atlanta and Milwaukee, and bought 90 outlets in Houston.
- Both BP America and Texaco expanded operations in the Pacific Northwest. Texaco additionally expanded in Hawaii and Los Angeles.
- Kerr-McGee began to consolidate its operations in the Midwest by selling its Southeast operations. [\(Note 30\)](#)

1992

- Exxon announced that it would cease marketing motor gasoline in the Los Angeles, California area.
- BP America announced its intent to sell 300 outlets in Northern California and Florida and agreed to sell during 1993 its Washington refinery and the associated retail outlets in Washington and Oregon to Tosco.

- Chevron acquired 69 outlets from Shell Oil that were in the Atlantic Coast area and exchanged 60 mid-Atlantic outlets for Exxon outlets in Southeast Florida. ([Note 31](#))

Figure 7. U.S. Average Annual Employee Salary for Motor Gasoline Outlets, 1990-1998



Note: Average computed by dividing annual salary payments by the number of employees during the week including March 12.

The decline in the annual salary during 1993 and 1994 is partly due to more general declines in retailing salaries, which apparently lagged the economic expansion of that began in early 1992 by a couple of years. There also may be some effect arising from the 1992 Economic Census. More data are collected on establishments during Census years than during non-Census years, resulting in some difference in the industry to which a particular establishment is assigned during a Census year relative to non-Census years.

Source: U.S. Department of Commerce, [U.S. Census Bureau, County Business Patterns](#) (1990-1998).

1993

- Sun exited marketing operations in 7 states between 1991 and 1993.
- BP America ceased its operations in 8 states between 1991 and 1993.
- Unocal, which had operations in 44 states in 1991, operated in only 7 western states by the end of 1993. ([Note 32](#))

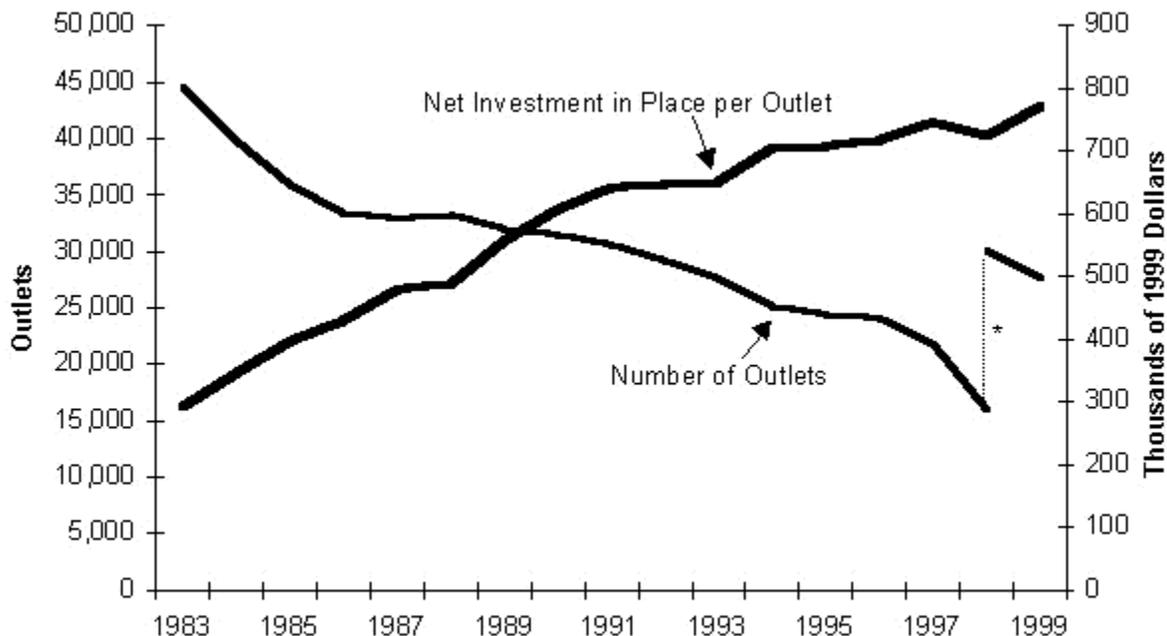
1994

- BP sold its California retail network to Tosco.
- Ashland, Exxon, Fina, Mobil, and Unocal all phased out selected retail operations. ([Note 33](#))

1995

- Kerr-McGee sold its refineries and retail outlets to Gary Williams Co., Calumet Lubricants Co., and Koch Industries. ([Note 34](#))

Figure 8. Net Investment in Place per U.S. Majors' Company-Operated and Lessee Dealer Outlet and Number of Outlets, 1983-1999



*: Eleven companies were added to the group of U.S. majors in 1998, which is the largest single-year change in the history of the U.S. majors (i.e., the [Financial Reporting System](#) companies).

Note: Net investment in place is the sum of net property, plant, and equipment and the year-end balance of investments and advances to unconsolidated affiliates.

Source: Energy Information Administration, Form EIA-28 ([Financial Reporting System](#)).

1997

- Unocal sold its West Coast refineries and retail network to Tosco ([Note 35](#)) and its share of the Uno-Ven Midwest joint venture to [Petroleos de Venezuela, S.A. \(PdVSA\)](#) ([Note 36](#)).

1998

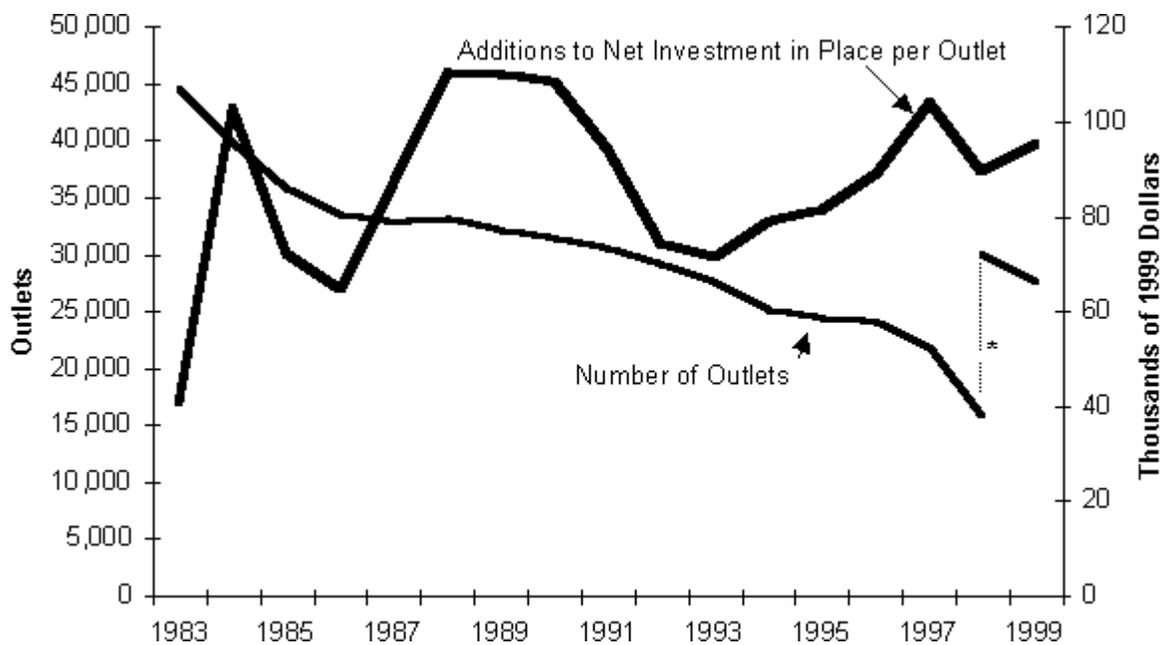
- Coastal sold 64 outlets in Illinois, Iowa, Kansas, Missouri, Nebraska, and Texas in addition to selling or closing another 36 outlets. ([Note 37](#))
- Phillips sold 70 retail outlets to its branded marketers. ([Note 38](#))

1999

- ARCO sold 107 outlets while acquiring 99 outlets.
- BP Amoco sold 124 outlets to Tosco.
- Chevron sold 22 outlets.

- Premcor (formerly Clark USA) divested its entire marketing network of 863 outlets, exiting the U.S. motor gasoline marketing industry.
- Motiva divested 228 outlets while acquiring 53 outlets.
- Phillips acquired 17 outlets.
- Sunoco divested 58 dealer outlets and added 57 company-operated outlets.
- Tosco acquired 124 BP Amoco outlets (noted above) and 43 Boardman (branded "Smile") outlets, and divested 370 outlets in "non-core" areas.
- Ultramar Diamond Shamrock sold 177 outlets to Marathon Ashland Petroleum while divesting another 239 outlets. ([Note 39](#))

Figure 9. Additions to Net Investment in Place per U.S. Majors' Company-Operated and Lessee Dealer Outlet and Number of Outlets, 1983-1999



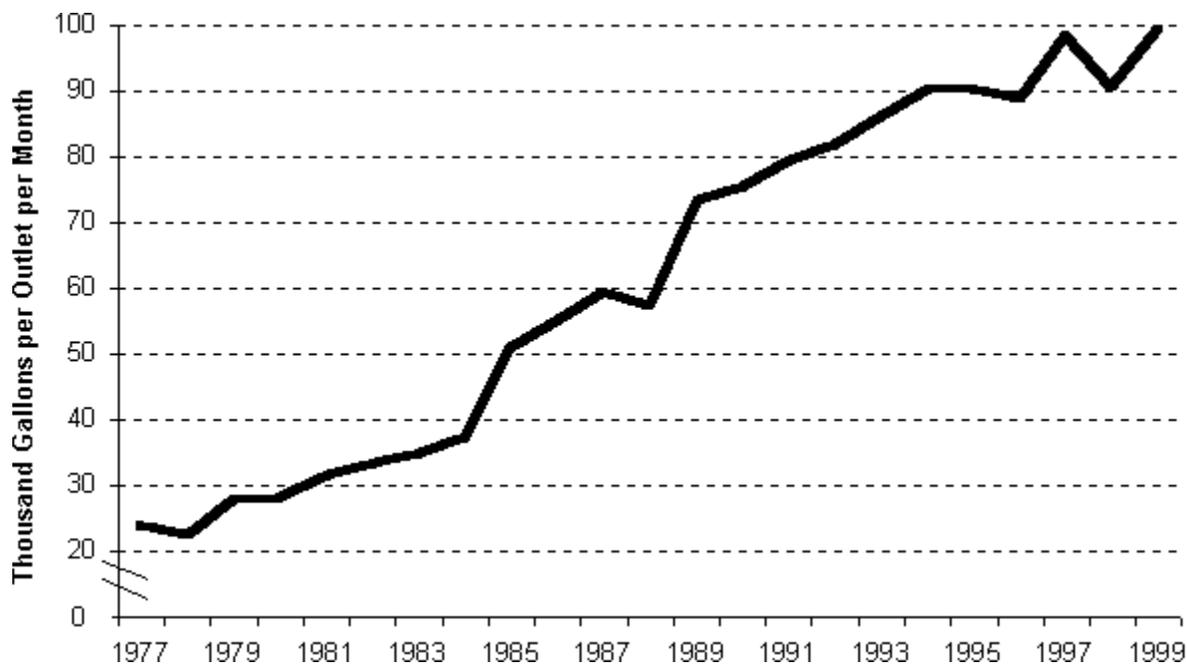
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Note: Net investment in place is the sum of net property, plant, and equipment and the year-end balance of investments and advances to unconsolidated affiliates.

Source: Energy Information Administration, Form EIA-28 ([Financial Reporting System](#)).

The low ([Note 40](#)) growth of U.S. motor gasoline sales, which averaged a 2 percent between 1990 and 1999, ([Note 41](#)) provided motivation for gasoline retailers to work particularly hard at reducing their operating costs. More motivation to reduce costs was provided by the relatively low returns of domestic refining/marketing relative to the other lines of business of the integrated refiners over the decade of the 1990's ([Figure 13](#)). Consequently, it's hardly surprising that between 1990 and 1999 the average number of states (including the District of Columbia) in which an integrated refiner had motor gasoline retailing operations fell from 28 to 20 ([Table 1](#)).

Figure 10. U.S. Major Branded Retail Motor Gasoline Outlet Average Monthly Volume, 1977-1999



Source: Energy Information Administration, Form EIA-28 ([Financial Reporting System](#)).

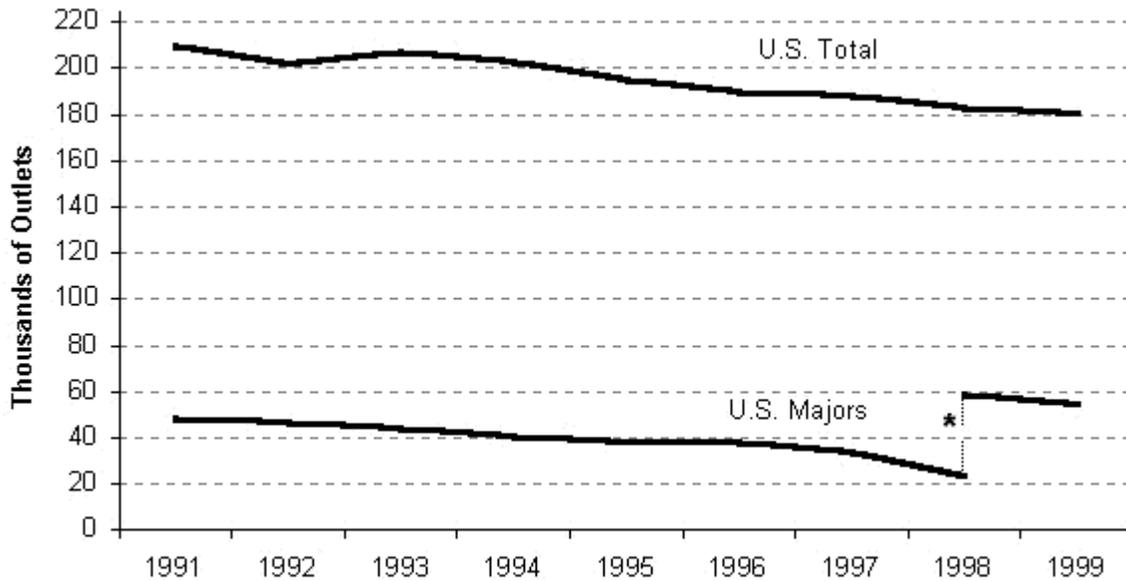
Expansion Characterizes Independents' Gasoline Marketing During 1990's

While the integrated refiners were refocusing and consolidating their refining and marketing operations during the 1990's, the non-integrated refiners were moving in essentially the opposite direction; expanding both their focus and their areas of operation. The impetus appeared to build through the early years of the decade and continued through the end of the decade.

Non-integrated refiners expanded their marketing operations through acquiring retail outlets and refineries, many of which were acquired from the integrated refiners ([Table 2](#)). For example, Tosco acquired BP's West Coast operations, Exxon's southwest operations, and Unocal's West Coast operations. ([Note 42](#)) However, some of the largest transactions did not involve the integrated refiners. For example, in 1996 Tosco acquired Circle K, a convenience store chain. Ultramar and Diamond Shamrock merged in 1996 to form Ultramar Diamond Shamrock (UDS), ([Note 43](#)) which then acquired Total North America in 1997. After failed attempts to form joint ventures with PetroCanada (1997), Conoco (1997), and Phillips (1998), UDS announced in June 2001 that it was merging with Valero Energy. ([Note 44](#)) Similarly, Phillips Petroleum and Tosco announced in February 2001 that the two companies were merging. ([Note 45](#))

The growth of the non-integrated refiners over the decade of the 1990's was remarkable ([Table 2](#)). The non-integrated refiners had retail operations in an average of 10 states in 1990 with a total of 13,117 retail outlets. By 1999 the average number of states had risen to 22 and the non-integrated refiners' total retail outlets numbered 21,970. ([Note 46](#))

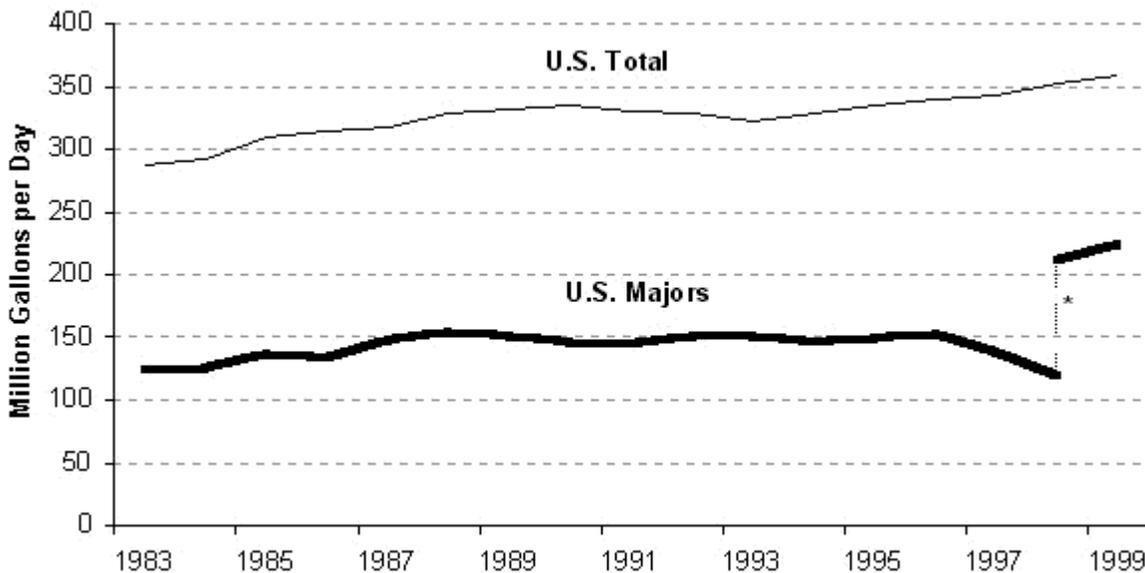
Figure 11. Number of Motor Gasoline Retail Outlets, U.S. Majors and U.S. Total, 1991-1999



*: Eleven companies were added to the group of U.S. majors in 1998, which is the largest single-year change in the history of the U.S. majors (i.e., the [Financial Reporting System](#) companies).

Note: Only the outlets that the U.S. majors directly supply are included in their total. The outlets that are directly supplied includes company-operated outlets, lessee dealer outlets, and open dealer outlets. See Energy Information Administration, [Performance Profiles of Major Energy Producers](#), DOE/EIA-0206 (Washington, DC), [Glossary](#) for additional information.

Figure 12. Motor Gasoline Supplied, 1983-1999

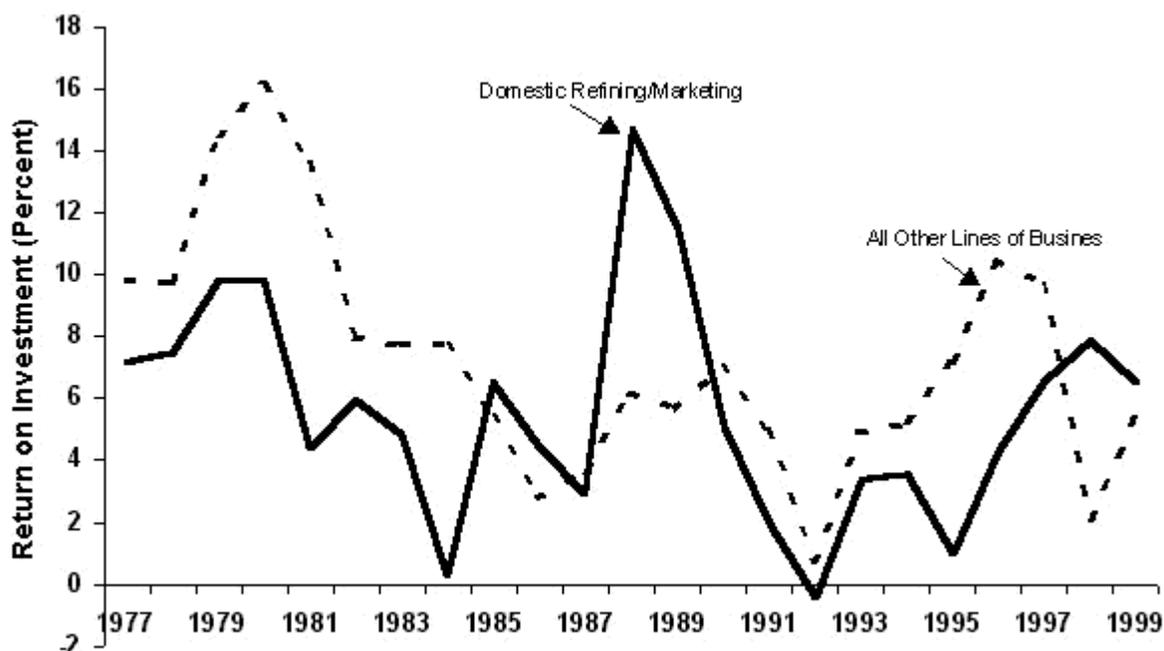


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Sources: Energy Information Administration; U.S. Total: [Form EIA-782C](#) (Monthly Report of Prime Supplier Sales of Petroleum Products Sold for Local Consumption); and U.S. Majors: Form EIA-28 ([Financial Reporting System](#)).

Figure 13. Return on Investment in Domestic Refining/Marketing and All Other Lines of Business for U.S. Majors, 1977-1999



Note: The 1988-1989 peak was achieved following, "... a wrenching adjustment to long-term changes in market conditions and product requirements ...," including the closure of 100 refineries with a total crude oil distillation capacity of more than 3 million barrels per day. Further, the ability of U.S. refiners to produce higher-valued light products from lower-priced heavy, high sulfur crude oil increased. See, Energy Information Administration, *Performance Profiles of Major Energy Producers 1989*, DOE/EIA-0206(89) (Washington, DC, January 1991), pp. 39-40.

However, a product price/crude oil price squeeze caused by the Iraqi invasion of Kuwait during 1990, and subsequent investment motivated by the Clean Air Act Amendments of 1990 rather than economic considerations depressed profitability for the early 1990's.

The 1998 decline in "All Other Lines of Business" was driven by the low crude oil prices of 1998, which depressed the return on investment for domestic and foreign oil and gas operations. See Energy Information Administration, *Performance Profiles of Major Energy Producers 1998*, DOE/EIA-0206(98) (Washington, DC, January 2000), Chapter 3, "Behind the Bottom Line."

Source: Energy Information Administration, Form EIA-28 ([Financial Reporting System](#)).

Profitability of the U.S. Majors Grows

Profitability in the 1990's

The profitability ([Note 47](#)) of the U.S. majors domestic refining and marketing operations ([Note 48](#)) was lower than the profitability of the other operations of the U.S. majors for much of the 1990's ([Figure 13](#)). However, the profitability of domestic refining and marketing has increased since 1995 and since 1997 has exceeded the profitability of the majors'

Table 1. Number of States in Which U.S. Majors' Motor Gasoline Outlets Are Located, 1983-1999

Non-Integrated Refiners							
	1983	1984	1985	1986	1987	1988	1989
CITGO	31	31	39	39	39	40	42
Clark Refining (now Premcor)	n.a.	n.a.	n.a.	12	12	12	12
Equilon ^g							
Motiva ^g							
Sunoco ^a							
Tesoro Petroleum	0	0	0	0	0	0	0
Tosco ^{b,1}	0	9	n.a.	n.a.	n.a.	n.a.	n.a.
Circle K	n.a.	22	5	n.a.	12	22	23
Ultramar Diamond Shamrock ^c							
Diamond Shamrock	25	24	12	12	9	8	8
Total Petroleum	22	22	21	19	18	20	22
Ultramar/Beacon	3	3	n.a.	n.a.	6	2	1
Valero Energy	0	0	0	0	0	0	0
Integrated Refiners							
Amoco ^d	35	36	36	30	30	30	31
ARCO ^e	24	22	6	6	6	5	5
Ashland ^f	7	26	15	16	18	19	18
BP/Sohio	20	30	19	29	29	28	26
Chevron	39	38	43	33	34	33	33
Coastal (now El Paso)	n.a.	n.a.	n.a.	n.a.	22	22	23
Conoco	40	40	38	40	39	37	37
Exxon ^h	41	38	39	37	37	37	38
Fina (now Atofina Petrochemical)	20	22	24	24	24	24	23
Hess	n.a.						
Kerr-McGee	21	18	20	22	21	21	20
Marathon	5	6	6	6	6	8	8
Mobil	43	41	40	40	37	36	33
Phillips	37	34	34	37	36	33	35
Shell Oil ^g	40	38	40	41	41	41	40
Sunoco ^a	27	29	29	29	28	28	28
Texaco ^g	45	46	47	46	44	45	49
Unocal ⁱ	44	42	41	41	41	43	43
^a : Sunoco, then known as Sun, was an integrated refiner through 1996 when it sold its oil and gas production operations.							
^b : Circle K was acquired by Tosco in 1996.							
^c : Diamond Shamrock and Ultramar merged in 1996, forming Ultramar Diamond Shamrock.							
^d : Amoco is included in BP/Sohio total beginning in 1998 due to BP's acquisition of Amoco .							
^e : ARCO is included in BP/Sohio total beginning in 1999 due to BP's acquisition of ARCO .							
^f : Ashland is included in Marathon total beginning in 1998 due to the Marathon Ashland Petroleum joint venture operated by Marathon.							
^g : Operations of Shell Oil and Texaco were merged into the joint ventures Equilon and Motiva beginning in 1998.							
^h : Mobil is included in Exxon total beginning in 1999 due to Exxon's acquisition of Mobil .							
ⁱ : Tosco acquired Unocal's West Coast operations in 1997 .							
n.a.: data not available							
Sources: 1983 - 1990: <i>National Petroleum News (NPN), Fact Book</i> , (mid-June 1984-1991); 1991 - 1999: <i>NPN, Market Facts</i> , (mid-June 1992 -1995; mid-July 1996-2000).							

**Table 1. Number of States in Which U.S. Majors' Motor Gasoline Outlets Are Located, 1983-1999
(continued)**

Non-Integrated Refiners										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
CITGO	46	46	46	45	46	46	48	48	48	47
Clark Refining (now Premcor)	12	12	11	12	12	12	12	12	10	10
Equilon ^g									32	32
Motiva ^g									26	26
Sunoco ^a								19	18	18
Tesoro Petroleum	0	1	1	1	1	3	3	3	5	5
Tosco ^{b,1}	0	n.a.	n.a.	2	4	4	27	37	36	36
Circle K		18	n.a.	5	27	27				
Ultramar Diamond Shamrock ^c							10	19	7	17
Diamond Shamrock	8	8	8	8	8	9				
Total Petroleum		22	20	18	17	18	19			
Ultramar/Beacon	1	1	1	1	1	1				
Valero Energy	0	0	0	0	0	0	0	0	0	1
Integrated Refiners										
Amoco ^d	33	32	30	29	30	30	33	33		0
ARCO ^e	5	5	5	5	5	5	5	5	5	0
Ashland ^f	18	18	13	11	11	11	11			
BP/Sohio	33	33	28	25	27	27	21	21	37	42
Chevron	33	32	31	33	27	27	25	30	28	29
Coastal (now El Paso)	28	34	36	36	37	36	36	36	32	34
Conoco	37	36	28	28	41	41	41	41	20	20
Exxon ^h	40	39	37	37	37	37	41	40	36	36
Finia (now Atofina Petrochemical)	25	25	11	11	12	12	15	15	15	15
Hess	6	n.a.	n.a.	n.a.	6	6	6	6	6	n.a.
Kerr-McGee	20	13	13	13	13	0	0	0	0	0
Marathon	9	9	11	11	11	11	11	12	12	16
Mobil	33	34	32	30	27	32	29	30	34	
Phillips	29	29	32	33	33	32	32	32	31	32
Shell Oil ^g	41	41	39	40	41	40	41	39		
Sunoco ^a	28	27	n.a.	20	19	19	19			
Texaco ^g	49	24	24	24	23	24	25	19		
Unocal ⁱ	41	7	7	7	7	7	7	0	0	0
^a : Sunoco, then known as Sun, was an integrated refiner through 1996 when it sold its oil and gas production operations. ^b : Circle K was acquired by Tosco in 1996. ^c : Diamond Shamrock and Ultramar merged in 1996, forming Ultramar Diamond Shamrock. ^d : Amoco is included in BP/Sohio total beginning in 1998 due to BP's acquisition of Amoco . ^e : ARCO is included in BP/Sohio total beginning in 1999 due to BP's acquisition of ARCO . ^f : Ashland is included in Marathon total beginning in 1998 due to the Marathon Ashland Petroleum joint venture operated by Marathon. ^g : Operations of Shell Oil and Texaco were merged into the joint ventures Equilon and Motiva beginning in 1998. ^h : Mobil is included in Exxon total beginning in 1999 due to Exxon's acquisition of Mobil . ⁱ : Tosco acquired Unocal's West Coast operations in 1997 . n.a.: data not available Sources: 1983 - 1990 : <i>National Petroleum News (NPN), Fact Book</i> , (mid-June 1984-1991); 1991 - 1999 : <i>NPN, Market Facts</i> , (mid-June 1992 -1995; mid-July 1996-2000).										

Table 2. Refinery Capacity, Number of Marketing Outlets, and Acquisitions of Selected Non-Integrated Refiner/Marketers, by Company, 1990-2001

Non-Integrated Refiner	1990	Refinery Acquisitions, 1991-2001			2001
	Refinery Capacity ^a	Capacity	Divesting Company	Year of Transaction	Refinery Capacity ^a
Citgo /PDV America	435,000	28,000	Amoco	1993	705,700
		76,850	Uno-Ven	1997	
		76,850	Unocal	1997	
Ultramar Diamond Shamrock ^b	227,000	147,000	Total North America	1997	574,689
		156,000	Tosco	2000	
Diamond Shamrock	161,000				
Ultramar	66,000				
Tosco	131,900	200,000	Exxon	1993	1,302,300
		84,300	BP America	1994	
		172,000	BP America	1996	
		243,000	Unocal	1997	
		250,000	BP Amoco	2000	
		288,300	Equilon	2000	
Premcor Refining	121,600	185,000	Chevron	1995	518,015
		161,500	BP America	1998	
Tesoro Petroleum	72,000	108,200	Shell Oil	1998	273,000
		95,000	BHP Ltd.	1998	
Valero Energy	25,000	279,600	Basis Petroleum	1997	739,100
		152,000	Mobil	1998	
		129,500	Exxon Mobil	2000	
		98,000	El Paso Corp.	2001	
Group total	1,012,500	2,931,100			4,112,804

^a: Refining capacity is measured by crude oil distillation capacity, which tends to be a smaller value than companies typically indicate as the capacity of their refineries.

^b: Diamond Shamrock and Ultramar merged in 1996, creating the company Ultramar Diamond Shamrock.

^c: Premcor Refining divested its retail operations during 1999, selling 863 retail outlets and the Clark brandname.

Note: The group total increase of refining capacity and marketing outlets between 1990 and May 2001 occurred through both acquisitions and internal growth.

Sources: **Refining capacity:** *Petroleum Supply Annual 1990*, Volume 1, DOE/EIA-0340(90)/1 (Washington, DC, May 1991), Table 40; and *Petroleum Supply Annual 1999, Volume 1*, DOE/EIA-0340(99)/1 (Washington, DC, June 2000), Table 40. **Retail outlets:** *National Petroleum News, 1991 Fact Book*, Volume 83, Number 7 (mid-June 1991), pp. 34-40; and *National Petroleum News, Market Facts 2000*, Volume 92, Number 8 (mid-July 2000), pp. 40-48. **Acquisitions:** Press releases, company public disclosures, and various news sources.

remaining lines of business. These results elicit two obvious questions, "From where did the higher profitability of domestic refining and marketing come?" and "What means were used to gain this result?"

Refining and marketing profitability is strongly correlated with the net refined product margin. (Note 49) It is through the net refined product margin that the two questions posed above concerning the increased profitability of the U.S. majors' refining and marketing operations may be examined. The net refined product margin is the gross refining

Table 2. Refinery Capacity, Number of Marketing Outlets, and Acquisitions of Selected Non-Integrated Refiner/Marketers, by Company, 1990-2001 (continued)

Non-Integrated Refiner	1990	Marketing Acquisitions, 1991-2001			2001
	Number of Marketing Outlets	Number of Outlets	Divesting Company	Year of Transaction	Number of Marketing Outlets
Citgo/PDV America	9,734				13,663
Ultramar Diamond Shamrock^b	2,314	2,106	Total North America	1997	4,456
Diamond Shamrock	1,914				
Ultramar	400				
Tosco	0				6,563
		1,900	Circle K	1996	
		1,325	Unocal	1997	
		1,740	Exxon Mobil	1999	
Premcor Refining	937				0 ^c
		123	Various	1994-1997	
Tesoro Petroleum	132				194
		32	BHP Ltd.	1998	
Valero Energy	0				340
		340	Exxon Mobil	2000	
Group total	13,117	7,566			25,216

^a: Refining capacity is measured by crude oil distillation capacity, which tends to be a smaller value than companies typically indicate as the capacity of their refineries.

^b: Diamond Shamrock and Ultramar merged in 1996, creating the company Ultramar Diamond Shamrock.

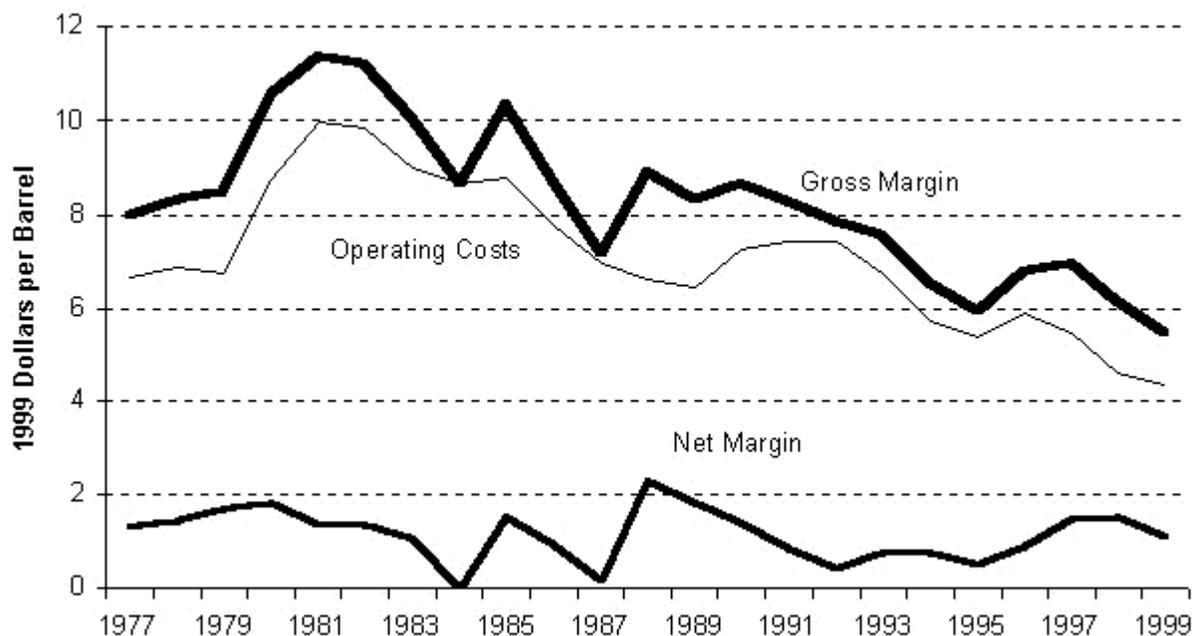
^c: Premcor Refining divested its retail operations during 1999, selling 863 retail outlets and the Clark brandname.

Note: The group total increase of refining capacity and marketing outlets between 1990 and May 2001 occurred through both acquisitions and internal growth.

Sources: **Refining capacity:** *Petroleum Supply Annual 1990*, Volume 1, DOE/EIA-0340(90)/1 (Washington, DC, May 1991), Table 40; and *Petroleum Supply Annual 1999, Volume 1*, DOE/EIA-0340(99)/1 (Washington, DC, June 2000), Table 40. **Retail outlets:** *National Petroleum News, 1991 Fact Book*, Volume 83, Number 7 (mid-June 1991), pp. 34-40; and *National Petroleum News, Market Facts 2000*, Volume 92, Number 8 (mid-July 2000), pp. 40-48. **Acquisitions:** Press releases, company public disclosures, and various news sources.

margin ([Note 50](#)) minus out-of-pocket operating costs per barrel of refined products sold. ([Note 51](#)) The net refined product margin is a useful tool to examine the question of the source of petroleum refining and marketing profitability because it allows one to separate the effects of product price changes (chief of which is motor gasoline) and operating cost changes.

Figure 14. Gross Margin, Operating Costs, and Net Margin for U.S. Majors Petroleum Products, 1977-1999



Source: Energy Information Administration, Form EIA-28 ([Financial Reporting System](#)).

Over most of the decade of the 1990's the gross refining margin declined, largely indicative of the declining spread between petroleum product prices and raw materials costs (chiefly crude oil costs). However, the net refined product margin generally increased over the same period ([Figure 14](#)). ([Note 52](#)) Historically, increases in the net margin tended to occur when the gross margin increased. During the 1990's a change occurred as the U.S. majors made an apparently concerted cost-cutting effort. Consequently, net margins rose despite falling gross margins. Thus, the increased profitability was largely due to successful efforts to reduce costs.

Cost-Cutting by the U.S. Majors During the 1990's

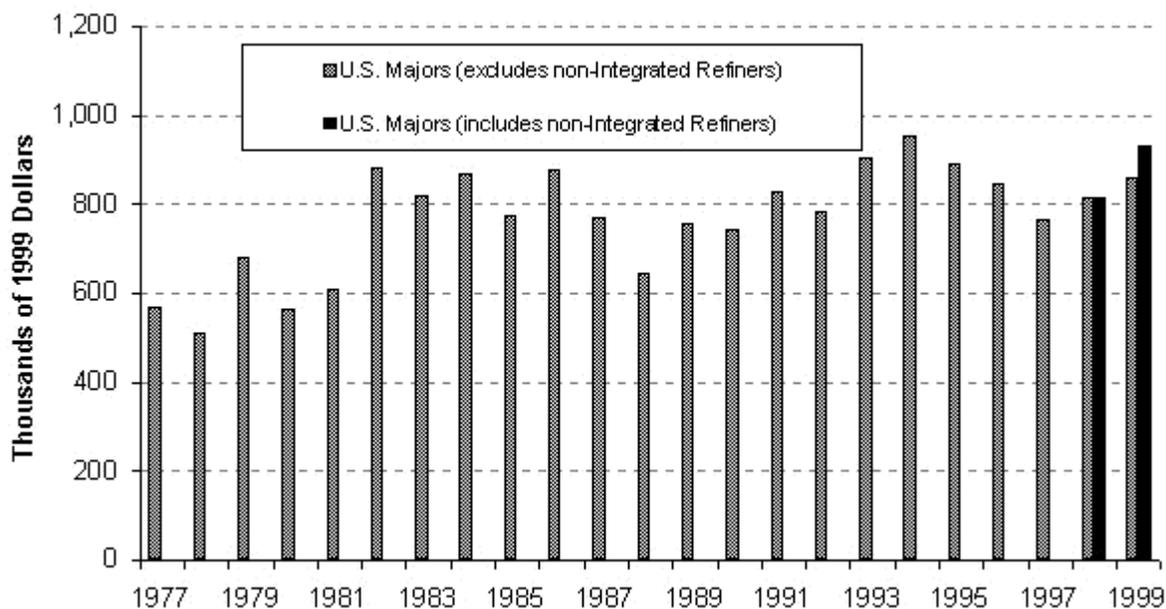
Now that successful cost-cutting has been credited with the increased profitability of the U.S. majors' refining and marketing operations in the 1990's, the remaining question, "What was the source of the cost reductions?" may be pursued. Several actions, some well worn but still useful, and others newly developed, were undertaken. Among the already existing options were using wholesalers more heavily to market motor gasoline, and finding a partner to share costs through a joint venture. The newly created options incorporated technological advances to lower costs (e.g., satellite communication and in-pump card readers).

Wholesalers and Joint Ventures Although there have been several accusations over the years that the U.S. majors use their company-operated outlets to pressure their dealer outlets, there is some evidence that the U.S. majors sometimes prefer to avoid retailing entirely. ([Note 53](#)) In particular, the U.S. majors increased their reliance on wholesale sales and direct sales ([Note 54](#)) over the decade, both of which by-pass their company-operated and dealer

outlets ([Figure 15](#)) and involve lower costs to the U.S. majors. In 1990, 53 percent of the U.S. majors' motor gasoline sales were either wholesale sales or direct sales. By 1999, the percentage had grown to 61.

Joint ventures are one way in which two (or more) companies can effectively share costs, reducing the per-unit costs of each. Joint ventures have been used extensively for many years in petroleum exploration, development, and

Figure 15. U.S. Majors' Third-Party Motor Gasoline Sales Shares by Distribution Channel, 1982-1999



Source: Energy Information Administration, Form EIA-28 ([Financial Reporting System](#)).

production. However, for many years, [Caltex](#) (which was created in 1936) was the only petroleum refining/marketing joint venture involving a U.S. major. In fact, both of the partners were (and still are) U.S. majors, Chevron (then Standard Oil of California) and Texaco, but all of the operations of Caltex were overseas. Caltex currently operates in Asia/Pacific, Africa, and the Middle East.

Many years later, in November 1988, another refining/marketing joint venture including a U.S. major was created. Again, Texaco was one of the partners. This time the joint venture operated domestically and was a partnership between Texaco and Saudi Aramco, the state oil company of Saudi Arabia. The venture was called Star Enterprise and operated along the East and Gulf coasts. The outlets associated with the joint venture were branded "Texaco."

One year later, in November 1989, Unocal and Petroleos de Venezuela (PdVSA), the state oil company of Venezuela, created a joint venture called Uno-Ven. Uno-Ven operated in the Midwest with outlets branded "76." [When Unocal exited the U.S. petroleum refining and motor gasoline marketing industry in 1996, they sold their interest in Uno-Ven to their partner PdVSA, which fulfilled all the supply contracts for their remaining terms. After the supply contracts expired some outlets became Citgo outlets and the remaining outlets found other suppliers.]

The most-recently created joint ventures, Marathon Ashland Petroleum, Equilon, and Motiva, all began operating in 1998. [Marathon Ashland Petroleum](#) was created by Ashland and USX's Marathon and began operation in January 1998. Marathon Ashland Petroleum operates in the Midwest and South under the brandnames "Ashland," "Marathon," and "SuperAmerica." The venture is operated by Marathon, which owns 62 percent of the venture. ([Note 55](#))

[Equilon](#) also began operating in January 1998 and is a joint venture between Shell Oil (the U.S. affiliate of Royal Dutch/Shell) and Texaco. Equilon has operations in the West, Southwest, and Midwest under the brandnames "Shell" and "Texaco." [Motiva](#) began operation in July 1998 and is a joint venture between Shell Oil and Star Enterprise (i.e., Texaco and Saudi Aramco). Motiva has operations on the East and Gulf Coasts using the brandnames "Shell" and "Texaco." Shell controls both Equilon and Motiva, holding 56 percent of Equilon (Texaco holds the remaining 44 percent) and 35 percent of Motiva (both Saudi Aramco and Texaco hold equal shares of 32.5 percent). ([Note 56](#))

Technological Innovations and Other Cost-Reduction Efforts. Another way in which costs may be reduced is through the introduction of technological advances that produce more output per unit of input, or produce as much output at a lower cost. Among the earliest technical innovations introduced during the 1990's was pay-at-the pump technology. Card readers were installed directly into the motor gasoline pumps allowing the customer to choose to swipe her or his credit card, pump their motor gasoline, and receive a receipt without leaving the pump. This technology reduced the wait between the conclusion of fueling and paying, allowing more customers to pass through an outlet during a given period of time. BP, Chevron, Exxon, Mobil, and Shell all made this innovation during 1991. [\(Note 57\)](#) A later variation on this idea was the introduction of mini-transmitters (such as Mobil's "Speedpass") that could be attached to the customer's key ring. The use of the mini-transmitter allowed the customer the convenience of paying at the pump while avoiding the lost time and inconvenience of actually retrieving a credit card and swiping it in the in-pump card reader.

Another major technical innovation of the 1990's was the introduction of point-of-sales electronic payment systems. [\(Note 58\)](#) The point-of-sales payment system allowed real-time inventory tracking and quicker credit card approval through the use of computer networks and satellite communication.

Other innovations aimed at increasing the value and/or lowering the operating costs of the U.S. majors' retail outlets include introducing name-brand fast food (i.e., multiple-format/co-branding) and in-store automatic teller machines. Additional efforts were made to make the outlets a destination instead of a stop along the way. [\(Note 59\)](#) Another means of cost-cutting employed by the U.S. majors during the 1990's was elimination of their credit card operations. [\(Note 60\)](#)

Summary and Implications

This study has focused on motor gasoline marketing, perhaps the most visible of the lines of business of the U.S. majors' petroleum operations. Subsequent review of these collected data indicates that the U.S. majors' efforts to restructure their investment in domestic motor gasoline marketing and related cost reductions increased the profitability of their domestic refining and marketing operations over the latter part of the 1990's. In particular, the integrated refiners reduced the number of their branded retail outlets, increased the volume of motor gasoline sold through their remaining branded outlets, and added various non-motor gasoline activities to increase outlet revenue (or reduce outlet operating cost).

The integrated refiners' restructuring and cost-cutting created many opportunities for the non-integrated refiners to considerably expand the scale and scope of their motor gasoline marketing operations during the 1990's. Consequently, the distinctions between the integrated refiners and the non-integrated refiners (at least from a domestic refining/marketing perspective) blurred during the 1990's as the non-integrated refiners purchased many of the integrated refiners' divested assets. In fact, many of the non-integrated refiners of 1990 were considered U.S. majors by the conclusion of 1999. Of the 11 companies that were added to EIA's [Financial Reporting System](#) in 1998, 10 were non-integrated refiners.

One of the more interesting questions implied by the findings of this study is, "What companies will constitute the near-term set of companies that the Federal Trade Commission (FTC) allows to purchase divested assets of merging petroleum refining and gasoline marketing companies?" Throughout the 1990's the non-integrated refiners were consistently allowed by the FTC to purchase the assets that the FTC required the U.S. majors to divest in order to merge. However, now that the non-integrated refiners are U.S. majors, who will be allowed to purchase the assets (if any) that the FTC requires to be divested before approving future mergers? This study attempted to add to the organization and analysis of existing motor gasoline marketing data, and thereby to allow the FTC, other regulators, policy makers, and other interested parties to answer such questions more easily.

Endnotes

1. The U.S.-based energy companies that respond to the Form EIA-28 (the [Financial Reporting System](#) (FRS)) are considered U.S. majors by the Energy Information Administration (see P.L. 95-91, Sec. 205 (h)). Per the requirements of that statute, the Administrator of the Energy Information Administration designates the respondents to the FRS. Currently, the Administrator uses the following selection criteria: at least 1 percent of U.S. crude oil and natural gas liquids reserves or production, or at least 1 percent of natural gas reserves or production, or at least 1 percent of crude oil distillation capacity.
2. Energy Information Administration, [Annual Energy Review 2000](#), DOE/EIA-0384(00) (Washington, DC, July 2000), [Table 5.11](#). (Table 5.11 is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.)
3. The U.S.-based energy companies that respond to the Form EIA-28 (the [Financial Reporting System](#) (FRS)) are considered U.S. majors by the Energy Information Administration (see P.L. 95-91, Sec. 205 (h)). Per the requirements of that statute, the Administrator of the Energy Information Administration designates the respondents to the FRS. Currently, the Administrator uses the following selection criteria: at least 1 percent of U.S. crude oil and natural gas liquids reserves or production, or at least 1 percent of natural gas reserves or production, or at least 1 percent of crude oil distillation capacity.
4. Neilson Media Research, Monitor - Plus indicated that 18 of the U.S. majors spent a total of \$178.7 million on television advertising nationally in 1999 and \$185.1 million in 2000. See *National Petroleum News, Market Facts 2001* (Mid-July 2001), p. 10.
5. This particular data set is known as the [Financial Reporting System](#) and is collected by the [Energy Information Administration](#) on [Form EIA-28](#). The data cover the years 1977-1999, with the exception of a few data elements that also cover the years 1974-1976 and a few other data elements that were first collected in 1981.
6. "Integrated" and "non-integrated" simply refer to the presence, and absence, respectively, of vertical integration. In this case, the vertical integration refers to the combination of oil and gas production with petroleum refining and marketing. Those U.S. majors that are called "integrated" not only have petroleum refining and marketing operations, but also have oil and gas production operations. Those U.S. majors that are called "non-integrated" do not have oil and gas production operations, only petroleum refining and, with the exception of Premcor, marketing operations. The integrated refiners include the joint venture [Marathon Ashland Petroleum](#) (a joint venture between USX's [Marathon](#) and [Ashland](#)), and the companies [Amerada Hess](#), Atofina Petrochemical Inc. (whose parent is [TotalFinaElf](#)), [BP Amoco](#), [Chevron](#), [Conoco](#), [El Paso](#) (since its acquisition of Coastal), [Exxon Mobil](#), [Phillips](#), and USX's [Marathon](#).
7. The non-integrated refiners include the joint ventures [Equilon](#) (a joint venture between [Shell Oil](#) and [Texaco](#)), Lyondell-Citgo (a joint venture between [Citgo](#) and [Lyondell Chemical](#)), and [Motiva](#) (a joint venture between [Saudi Aramco](#), Shell Oil, and Texaco); and the companies [Citgo](#), [Premcor](#), [Sunoco](#), [Tesoro](#), [Tosco](#), [Ultramar Diamond Shamrock](#), and [Valero Energy](#).
8. U.S. Department of Commerce, [U.S. Census Bureau](#), *State Population Estimates*, Population Estimates Program (ST-99-3, December 1999).
9. McGraw-Hill Companies and the U.S. Department of Commerce, [International Trade Administration](#), [U.S. Industry and Trade Outlook 2000](#), p. 4-4.
10. See Energy Information Administration, *The Motor Gasoline Industry: Past, Present, and Future*, DOE/EIA-0539 (Washington, DC, January 1991), pp. 21-27; and *Gasoline Marketing in the United States Today*, Publication Number 1593 ([American Petroleum Institute](#), September 1986), p. 8.
11. This trend began more than a decade earlier as indicated by Thomas Hogarty's *The Decline of Motor Gasoline Service Stations and Motorists' Access to Car Maintenance Services*, Discussion Paper #058 ([American](#)

[Petroleum Institute](#), March 1989), Table 1; and Temple, Barker, and Sloane, Inc., *Gasoline Marketing in the 1980s: Structure, Practices, and Public Policy*, (Lexington, Massachusetts, May 1988), p. 23.

12. The availability of self-serve motor gasoline increased during the 1970's in response to upward pressure on motor gasoline prices due to the Arab oil embargo and subsequent instability associated with the ouster of the Shah of Iran. Self-serve motor gasoline allowed retailers to use fewer attendants (who were employed to fuel vehicles), passing along some of the saving to consumers.
13. Energy Information Administration, *The Motor Gasoline Industry: Past, Present, and Future*, DOE/EIA-0539 (Washington, DC, January 1991), pp. 5-8; and Temple, Barker, and Sloane, Inc., *Gasoline Marketing in the 1980s: Structure, Practices, and Public Policy*, (Lexington, Massachusetts, May 1988), pp. 23-38.
14. Energy Information Administration, [Performance Profiles of Major Energy Producers 1995](#), DOE/EIA-0206(95) (Washington, DC, February 1997), p. 44. (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.) Note that subsequent mergers have transformed ARCO into BP Amoco, Ashland's downstream operations into [Marathon Ashland Petroleum](#), and Exxon into [Exxon Mobil](#). Also the pending merger of [Chevron](#) and [Texaco](#), will replace them with [ChevronTexaco](#), if the merger is approved. Finally, Sun has changed its name to [Sunoco](#).
15. Non-gasoline convenience store revenues are not directly collected from the FRS companies, but revenue from non-gasoline sales is collected. The category "other refining and marketing revenue" was originally intended to measure revenue from sales of tires, batteries, and accessories at traditional gasoline stations. It now tends to capture convenience store non-gasoline sales revenue with an occasional unusual item (e.g., a favorable legal judgement) included. Although not all company-operated retail outlets have convenience store formats, many do.
16. The U.S. majors' branded motor gasoline retail outlets are divided into three categories: company-operated outlets, lessee dealer outlets, and open dealer outlets. Company-operated outlets are owned and operated by the U.S. major. Lessee dealer outlets are those in which the owner leases assets from and is supplied motor gasoline by the U.S. major. Open dealer outlets are those in which the owner is supplied motor gasoline by the U.S. major.
17. This attempt to quantify the importance of convenience item sales to motor gasoline marketing illustrates the difficulty of separating petroleum refining from motor gasoline marketing. Other studies encountered similar problems, e.g., Energy Information Administration, *The Motor Gasoline Industry: Past, Present, and Future*, DOE/EIA-0539 (Washington, DC, January 1991).
18. A substantial collection of articles related to hypermarkets is accumulating. Briefly, a hypermarket is a supermarket (especially in the United Kingdom), other traditional retail store, or discounter (such as Wal-Mart or Costco in the United States) with a motor gasoline outlet in the parking lot. See, for example, "New hypermart entrants to challenge existing U.S. gasoline marketers," *Oil and Gas Journal*, Volume 99, Number 20 (May 14, 2001), p. 56; and "New Hypermarkets," *Oil and Gas Journal*, Volume 99, Number 23 (June 4, 2001); "Hypermarket fears echoed in the canyon at SIGMA," *National Petroleum News*, Volume 93, Number 7 (July 2001), p. 17; and "Report: Hypermarkets grabbing Texas market share," *National Petroleum News*, Volume 93, Number 9 (August 2001), p. 10.
19. See *Gasoline Marketing in the United States Today*, Publication Number 1593 ([American Petroleum Institute](#), September 1986), p. 8.
20. Alternatively, an increase in the average number of employees could indicate a movement of repair work back to retail outlets, which seems unlikely.
21. However, a general movement toward more part-time employees is indicated by, ["On the decline in average weekly hours worked,"](#) a recent U.S. Department of Labor study by Katie Kirkland published in the [Monthly](#)

[Labor Review](#) (July 2000, pp. 26-31). (This article is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 57](#) to download the free software.)

More part-time employment may increase the average number of employees with no change in hours of operation. Thus, these data may be made more informative by indexing them by a more general category of labor. Indexing will tend to remove the effect of more general changes occurring in the labor force, and more starkly present changes in motor gasoline outlet employment.

22. This presumes that part-time employees tend to be paid less than are full-time employees over a period of time.
23. Beginning in 1998, the U.S. Census Bureau [switched from](#) the Standard Industrial Classification (SIC) system to the [North American Industry Classification System \(NAICS\)](#) with the result that a vertical displacement occurred in the motor gasoline outlet employment and salary data series. Between 1997 and 1999, the NAICS motor gasoline outlet average annual salary fell from 73 percent to 71 percent of the average annual salary for retail outlets in general.
24. See, "Removing the Cashier," *National Petroleum News*, Volume 93, Number 7 (July 2001), pp. 18-20.
25. This change is somewhat misleading because of the addition of 11 companies beginning with the 1998 reporting year. Ignoring these 11 companies, the U.S. majors company-operated and lessee outlets would have declined to 16,022 in 1999, a 49-percent decline since 1990.
26. The McGraw-Hill Companies and U.S. Department of Commerce, [International Trade Administration](#), [U.S. Industry and Trade Outlook 2000](#), (New York, 2000), p. 4-4.
27. Energy Information Administration, [Performance Profiles of Major Energy Producers 1999](#), DOE/EIA-0206(99) (Washington, DC, January 2001), [Figure 2](#). (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.)
28. Energy Information Administration, [Performance Profiles of Major Energy Producers 1999](#), DOE/EIA-0206(99) (Washington, DC, January 2001), [Table B28](#). (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.) Energy Information Administration, [Petroleum Supply Annual 1999](#), Volume 1, DOE/EIA-0340(99)/1 (Washington, DC, June 2000), [Table 17](#). (Table 17 is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.)
29. For a review of the changes in motor gasoline marketing during the 1980's, see "Massive Marketing Changes," in Energy Information Administration, [Performance Profiles of Major Energy Producers 1990](#), DOE/EIA-0206(90) (Washington, DC, December 1991), pp. 86-87.
30. Energy Information Administration, [Performance Profiles of Major Energy Producers 1991](#), DOE/EIA-0206(91) (Washington, DC, December 1992), pp. 41-42.
31. Energy Information Administration, [Performance Profiles of Major Energy Producers 1992](#), DOE/EIA-0206(92) (Washington, DC, January 1994), pp. 44-45.
32. Energy Information Administration, [Performance Profiles of Major Energy Producers 1993](#), DOE/EIA-0206(93) (Washington, DC, January 1995), p. 35. (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.)
33. Energy Information Administration, [Performance Profiles of Major Energy Producers 1994](#), DOE/EIA-0206(94) (Washington, DC, February 1996), pp. 40-41. (This publication is in pdf format, if you lack Adobe

Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.)

34. Energy Information Administration, [Performance Profiles of Major Energy Producers 1995](#), DOE/EIA-0206(95) (Washington, DC, February 1997), p. 40 (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.); and [Petroleum Supply Annual 1995, Volume 1](#), DOE/EIA-0340(95) (Washington, DC, May 1996), p. 81.
35. Energy Information Administration, [Performance Profiles of Major Energy Producers 1997](#), DOE/EIA-0206(97) (Washington, DC, January 1999), pp. 20 and 22. (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.)
36. See Unocal Corporation, ["Unocal, PDVSA to Restructure UNO-VEN Partnership"](#) (December 26, 1996).
37. The Coastal Corporation, *1998 Annual Report*, p. 12.
38. Phillips Petroleum Company, [1998 Securities and Exchange Commission Form 10-K](#), p. 19.
39. Energy Information Administration, [Performance Profiles of Major Energy Producers 1999](#), DOE/EIA-0206(99) (Washington, DC, January 1999), p. 50 (footnote 84) (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.); and Sunoco, Inc, [1999 Securities and Exchange Commission Form 10-K](#), p. 6.
40. Although 2 percent was a typical growth rate for the U.S. market during the 1990's, it is low relative to expanding markets such as Latin America.
41. Energy Information Administration, [Monthly Energy Review](#), DOE/EIA-0035(2001/06) (Washington, DC, June 2001), [Table 3.4](#). (Table 3.4 is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.)
42. Energy Information Administration, [Performance Profiles of Major Energy Producers 1997](#), DOE/EIA-0206(97) (Washington, DC, January 1999), pp. 20 and 22.
43. Ultramar Diamond Shamrock Corporation, *1997 Annual Report*, p. 16.
44. See, Energy Information Administration web site, ["Aspects of the Merger of Valero Energy Corp. and Ultramar Diamond Shamrock Corp."](#) (June 5, 2001).
45. See, Energy Information Administration web site, ["Aspects of the Merger of Phillips Petroleum and Tosco Corporation."](#) (February 7, 2001).
46. See, *National Petroleum News, Market Facts 2000* (mid-July 2001), pp. 43-45.
47. Profitability is computed by dividing domestic refining and marketing contribution to net income by domestic refining and marketing net investment in place. Net investment in place is the sum of net property, plant, and equipment and the year-end balance of investments and advances to unconsolidated affiliates.
48. Data constraints prevent the separation of the components in order to examine the profitability of only domestic marketing operations.
49. Energy Information Administration, ["The Impact of Environmental Compliance Costs on U.S. Refining Profitability."](#) (October 1997). In particular, see the text associated with [Figure 5](#) in the section entitled "[Key Findings](#)."

50. The gross refining margin is refined product revenues less purchases of raw material inputs to refining and refined product purchases.
51. Activities unrelated to petroleum product sales are excluded by the net refined product margin.
52. The net refined product margin was actually lower in 1999 than in 1990 (\$1.10 per barrel and \$1.42 per barrel, respectively), after adjusting for inflation. However, the average net margin for the years 1991-1995 was \$0.68 per barrel (including the year 1990 increases the average to \$0.80 per barrel), while the average for the years 1996-1999 was \$1.27 per barrel. Thus, over the period 1990-1999, the net refined product margin "generally" increased.
53. A recent anecdote appears to support this conclusion as Premcor exited motor gasoline marketing during 1999, becoming a merchant refiner. See, ["Clark Completes Sale of Marketing Assets"](#) (July 8, 1999).
54. Direct sales includes industrial and commercial sales, as well as spot sales. Direct sales tend to be in lots of greater than a tank truck load.
55. Energy Information Administration, [Performance Profiles of Major Energy Producers 1997](#), DOE/EIA-0206(97) (Washington, DC, January 1999), p. 39. (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.)
56. For the year 2000 the ownership shares changed slightly. Shell's share increased to 38.8 percent while Texaco's and Saudi Aramco's shares both fell to 30.6 percent. See Motiva Enterprises LLC, *2000 Financial Statements*, in Texaco Inc., [2000 Securities and Exchange Commission Form 10-K](#).
57. Energy Information Administration, *Performance Profiles of Major Energy Producers 1991*, DOE/EIA-0206(91) (Washington, DC, December 1992), p. 35. The U.S. majors were still noting their introduction of in-pump card readers to allow payment at the pump in their 1994 annual reports. See Energy Information Administration, [Performance Profiles of Major Energy Producers 1994](#), DOE/EIA-0206(94) (Washington, DC, February 1996), p. 40.
58. Energy Information Administration, *Performance Profiles of Major Energy Producers 1992*, DOE/EIA-0206(92) (Washington, DC, January 1994), pp. 44-45.
59. Energy Information Administration, [Performance Profiles of Major Energy Producers 1996](#), DOE/EIA-0206(96) (Washington, DC, January 1998), p. 51. (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following [Note 60](#) to download the free software.)
60. Energy Information Administration, [Performance Profiles of Major Energy Producers 1997](#), DOE/EIA-0206(97) (Washington, DC, January 1999), p. 42. (This publication is in pdf format, if you lack Adobe Acrobat Reader and are unable to read pdf format files, please follow the Adobe link following this endnote to download the free software.)