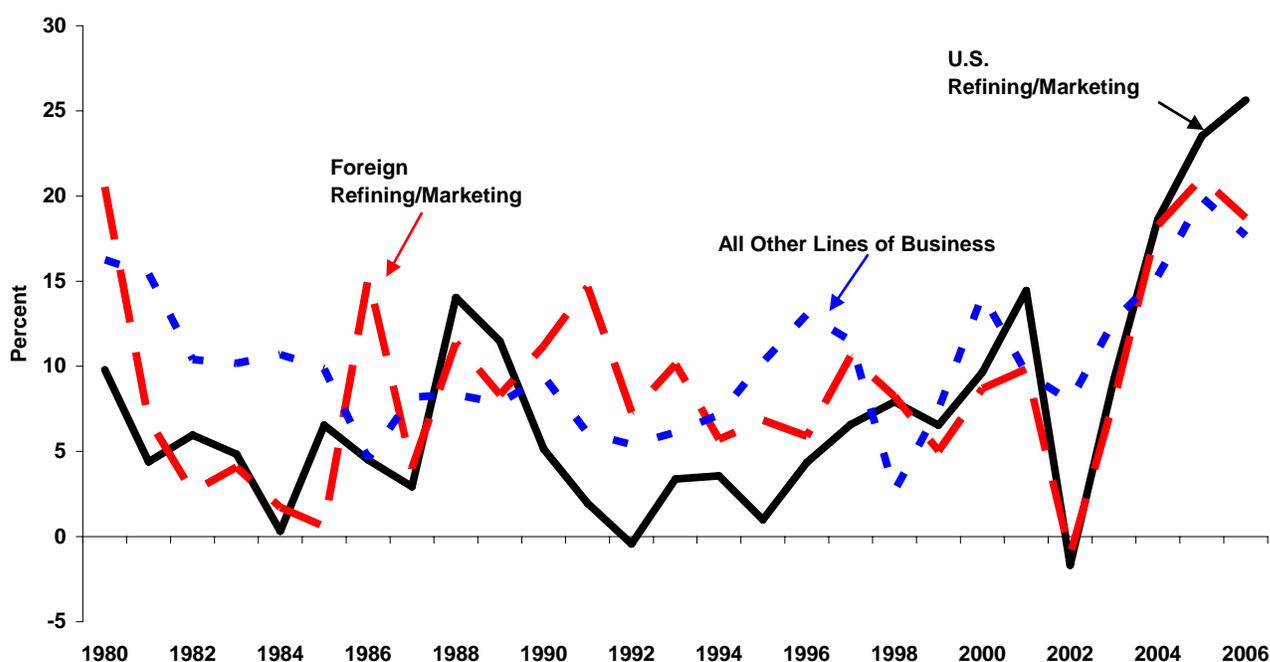


Refining and Marketing

U.S. Refining/Marketing

The average profitability (contribution to net income divided by net investment in place) of U.S. refining/marketing operations of the Financial Reporting System (FRS) companies reached 26 percent in 2006, the highest level in the history of the FRS survey. The new high exceeded the previous record—registered in 2005—by 2 percentage points, but was only 4 years removed from the all-time low for return on investment (since 1977) of -2 percent in 2002 (**Figure 18**). The recent history of the FRS companies' U.S. refining/marketing profitability has been one of consistent increases as they generated an above-average 9 percent in 2003, which was followed by all-time highs in 2004, 2005, and 2006. The ongoing cost-cutting efforts that characterized the domestic refining/marketing operations of the FRS companies in the 1990s and were a major contributor to the profitability of the period apparently have been less successful in recent years. Per-barrel operating costs increased in 2006 relative to the previous year (**Table 13**), as has occurred in five of the past 7 years.³⁴

Figure 18. Return on Investment in U.S. and Foreign Refining/Marketing, and All Other Lines of Business for FRS Companies, 1980-2006



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

An examination of the net refined product margin (net margin), which has been found to be strongly correlated with profitability,³⁵ can illuminate the reasons underlying changes in the profitability of U.S. refining/marketing operations. The net margin is the gross margin (essentially the difference between petroleum product prices and crude oil costs)³⁶ minus out-of-pocket operating costs per barrel of refined product sold. The net margin measures

³⁴ Unless otherwise indicated, all dollar values and percentage changes in this report are based in constant 2006 dollars, adjusted using the Gross Domestic Product implicit price deflator.

³⁵ The net margin is highly correlated with return on investment. The latest estimation of the relationship between refining margins and profitability is that the correlation coefficient is 0.93. See "Refining Margins as Predictors of Profitability" in Chapter 4 of *Performance Profiles of Major Energy Producers 2003*.

³⁶ More precisely, gross margins are calculated, on a per-barrel basis, by taking refined product revenues minus purchases of raw materials input to refining and refined product purchases.

Table 13. Sales, Prices, Costs, and Margins in U.S. Refining/Marketing for FRS Companies, 2005-2006

	2005	2006	Percent Change 2005-2006
Refined Product Sales (Million Barrels per Day)	22.4	21.3	-4.6
	(2006 Dollars per Barrel)		
Gasoline Average Price	73.38	83.79	14.2
Distillate Average Price	74.31	83.23	12.0
Other Products Average Price	49.03	58.50	19.3
All Refined Products Average Price	69.07	79.08	14.5
Less: Raw Materials Costs and Product Purchases	58.89	66.98	13.7
Equals: Gross Refining Margin	10.18	12.10	18.8
Less: Direct Operating Costs	6.56	6.81	3.8
Equals: Net Refining Margin ^a	3.62	5.29	45.9
Reseller/wholesaler spread (dealer price - wholesale price)	2.25	3.43	52.3
Retailer spread (company-operated price - dealer price)	5.81	4.88	-16.0

^aSee Appendix B, Table B32, for the components to calculate the refined product margin.

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

before-tax cash earnings from the production and sale of refined products.³⁷ The \$5.29-per-barrel net margin of 2006 was the highest (in terms of 2006 dollars) in the 30-year history of the FRS (**Figure 5**), exceeding the previous high of 2005 by \$1.66.

The average gross refining margin reported by the FRS companies in 2006 increased 19 percent compared to 2005 (**Table 13**). The average price received for petroleum products in 2006 (\$79.08 per barrel) increased \$10.01 relative to the 2005 value after adjusting for general price changes between 2005 and 2006, while raw materials and purchased product costs rose \$8.09 per barrel to \$66.98. These changes resulted in a \$1.92-per-barrel increase in the gross refining margin to \$12.10.

Revenues and Costs

Higher crude oil prices in 2006 (compared to 2005) put upward pressure on petroleum product prices. However, industry-wide stocks of petroleum products were consistently higher through 2006 than in 2005 (**Figure 19**),³⁸ while motor gasoline stocks were much lower during all of 2006 than in 2005 (**Figure 20**).³⁹ The former tended to put downward pressure on all product prices, while the latter tended to put upward pressure on motor gasoline prices. Furthermore, recovery from the effects⁴⁰ of Hurricanes Katrina and Rita on production and distribution of petroleum products was incomplete relative to the levels of 2004. Thus, supply effects, which had driven prices higher in 2005, continued in 2006. Despite U.S. crude oil stock levels reaching historically high levels during all of 2006 relative to 2005 (**Figure 21**), which tends to put downward pressure on crude oil prices, raw material and purchased product costs for FRS companies rose 14 percent (**Table 13**). Additionally, problems with the U.S. refining system⁴¹ put upward pressure on product prices and contributed to higher crude oil stock levels.

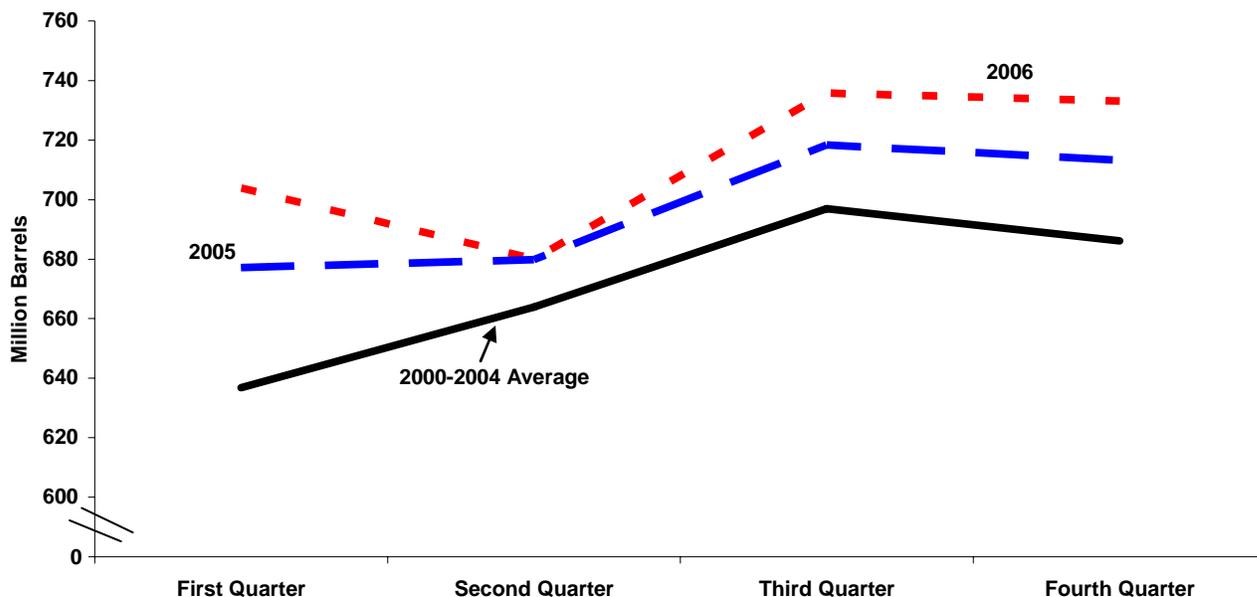
³⁷ The net margin excludes peripheral activities such as non-petroleum product sales at convenience stores.

³⁸ The stock levels of all petroleum products in 2006 were higher in each quarter relative to both 2005, varying from a low of less than 0.1 percent in the second quarter to a high of 4 percent in the first quarter, and the average for the period of 2000 through 2004, varying from a low of 2 percent in the second quarter to a high of 11 percent in the first quarter.

³⁹ The stock levels of motor gasoline in 2006 were lower in each quarter relative to both 2005, varying from a low of 3 percent in the first quarter to a high of 16 percent in the second quarter, and the average for the period of 2000 through 2004, varying from a low of 7 percent in the first quarter to a high of 24 percent in both the second and fourth quarters.

⁴⁰ Domestic crude oil production during 2006 recovered somewhat from the devastating effects of Hurricanes Rita and Katrina as overall U.S. production was 0.4 percent greater than in 2005 (but more than 5 percent lower relative to 2004 (Energy Information Administration, *Short-Term Energy Outlook*, Table 5a (December 6, 2005 and December 12, 2006)).

Figure 19. Quarterly Average U.S. Commercial Petroleum Product Stocks, 2000-2004 Average, 2005, and 2006



Source: Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109 (Various issues, Washington, DC), Table 51.

Petroleum product sales declined 5 percent in 2006 relative to 2005 (**Table 13**). The product sales are composed chiefly of motor gasoline and distillate, which decreased 5 percent and 2 percent, respectively, but all categories of petroleum product sales declined in 2006 relative to 2005 (**Table 14**). The result of lower sales and higher petroleum product prices was a 9-percent increase in domestic petroleum product sales revenues (**Table 15**). Meanwhile, operating costs increased by a slightly smaller amount than did sales revenues. This combination of increases in revenues and costs resulted in a 14-percent increase in operating income in 2006 over that of 2005 (\$33.8 billion and \$29.8 billion, respectively) and a 12-percent increase in net income relative to a year earlier (\$24.3 billion and \$21.6 billion, respectively).

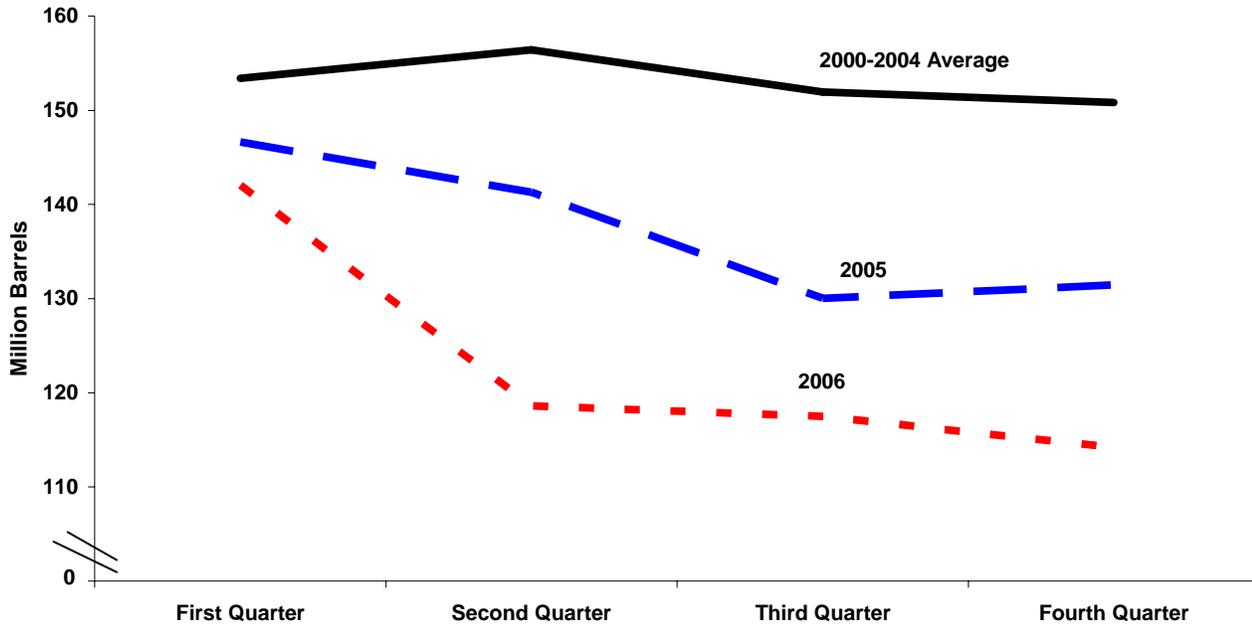
Overall domestic operating expenses increased 8 percent between 2005 and 2006 (**Table 15**). Similarly, those operating expenses most closely associated with refining and marketing operations on a per-barrel basis increased by 4 percent between 2005 and 2006 (**Table 13**). More particularly, operating expenses associated with refining (energy costs and other operating costs) increased by \$0.40⁴² per barrel, while marketing costs fell by \$0.15 per barrel (10 percent) (**Table 14**).

However, the production of the first half of the year was decidedly lower than in the first half of 2005, but increased each quarter relative to the previous quarter (see Energy Information Administration, *Short-Term Energy Outlook*, Table 5a (December 12, 2006 and August 7, 2007). Furthermore, refinery runs for the FRS companies were 6 percent lower in the first quarter of 2006 than in the first quarter of 2005 and 4 percent lower in the second quarter of 2006 compared to the second quarter of 2005 (see Energy Information Administration, “Financial News for Major Energy Companies”) (http://www.eia.doe.gov/emeu/perfpro/news_m/q106.pdf and http://www.eia.doe.gov/emeu/perfpro/news_m/q206.pdf, as of September 7, 2007).

⁴¹ “FTC: Market Factors Explain ’06 Gasoline Price Spurt,” *Oil and Gas Journal*, Volume 105, Number 34 (September 10, 2007); and “Market Watch: Hot weather drives up natural gas prices,” *Oil and Gas Journal Online* (July 21, 2006) at http://www.ogj.com/articles/email_screen.cfm?ARTICLE_ID=260608 (as of October 11, 2007).

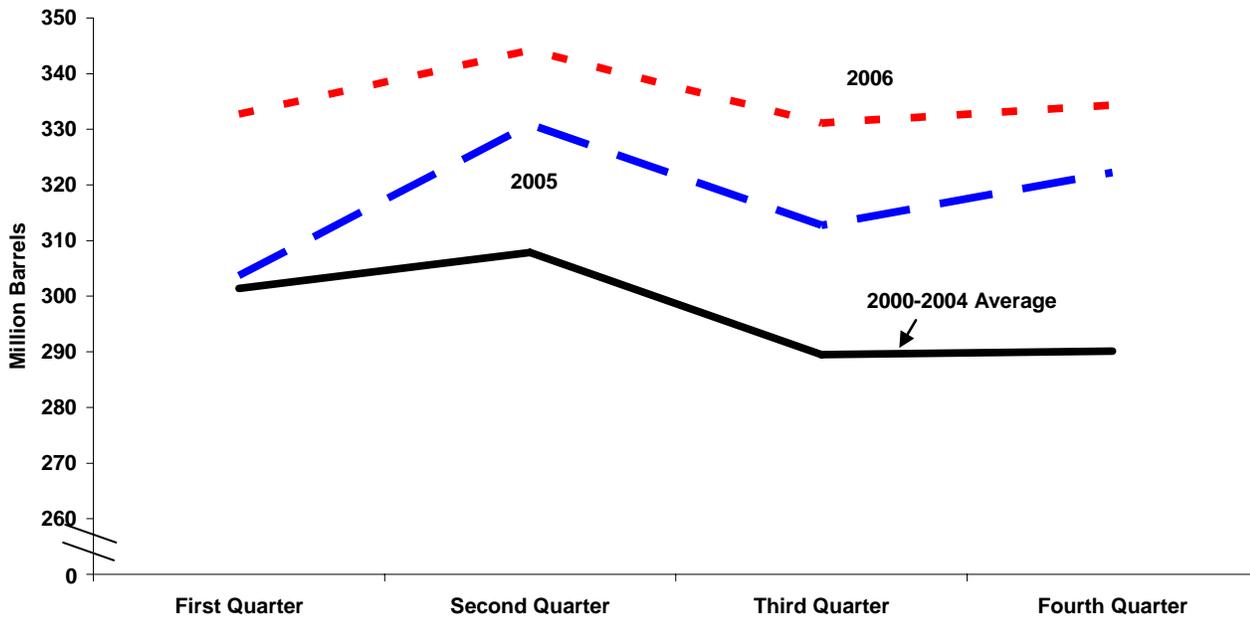
⁴² Refining energy costs fell by \$0.14 per barrel, but other refining costs increased by \$0.54 per barrel with the net effect of an 8 percent increase between 2005 and 2006.

Figure 20. Quarterly Average U.S. Motor Gasoline Stocks, 2000-2004 Average, 2005, and 2006



Source: Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109 (Various issues, Washington, DC), Table 51.

Figure 21. Quarterly Average U.S. Crude Oil Stocks, 2000-2004 Average, 2005, and 2006



Source: Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109 (Various issues, Washington, DC), Table 51.

Table 14. U.S. Refined Product Margins and Costs per Barrel Sold and Product Sales Volume for FRS Companies, 2005-2006

	2005	2006	Percent Change 2005 - 2006
	(2006 Dollars per Barrel)		
Gross Margin	10.18	12.10	18.8
- Marketing Costs	1.56	1.41	-9.9
- Energy Costs	1.88	1.74	-7.4
- Other Operating Costs	3.12	3.66	17.4
= Net Margin	3.62	5.29	45.9
	(Million Barrels)		
Product Sales Volume			
Motor Gasoline	11,720	11,190	-4.5
Distillate	6,434	6,313	-1.9
Other Products	4,203	3,835	-8.7
Total	22,358	21,339	-4.6

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

Continued efforts by the FRS companies to reduce their energy costs were successful in 2006, as costs decreased by \$0.14 per barrel (7 percent). Much of the explanation for lower energy costs is the 17-percent decrease in natural gas wellhead prices in 2006 relative to 2005 after adjusting for inflation. Further, refinery output fell slightly (2 percent, **Table 16**), putting downward pressure on the overall level of costs (but not necessarily costs per barrel of output). FRS companies continue their efforts to contain energy costs through cogeneration projects,⁴³ which have been one major approach taken to reduce energy costs over the last few years.⁴⁴

Other operating costs related to refining increased between 2005 and 2006, from \$3.12 per barrel to \$3.66 per barrel after adjusting for inflation (**Table 14**). Several factors contributed to this increase. Recent mergers and major transactions required adjustments of operations and corporate cultures, which tend to elevate operating costs. Additionally, adjustments to the effects of Hurricanes Katrina and Rita continued to occur through much of 2006, which elevated operating costs. Finally, adjustments to comply with the Clean Air Act Amendments of 1990 and the replacement of methyl tertiary butyl ether (MTBE) with ethanol have increased operating costs.⁴⁵

⁴³ During 2006, Exxon Mobil noted, “We continue to make significant investments in cogeneration facilities, which require substantially less energy and result in lower emissions versus separate conventional steam and power generation. In addition to the large facility we recently started up at Beaumont, Texas, we have several cogeneration facilities being progressed for start-up in future years (Exxon Mobil Corporation, *2006 Financial and Operating Review*, p. 68).”

⁴⁴ See for example, Energy Information Administration, *Performance Profiles of Major Energy Producers 2001*, DOE/EIA-0206 (2001) (Washington, D.C., January 2003), p. 43. (This publication is available on the Internet through a link at <http://www.eia.doe.gov/emeu/finance/histlib.html> (as of October 7, 2007).)

⁴⁵ Although we have no estimate of the significance of the environmental spending in 2006 for other operating costs, several companies indicated that their operating expenses attributable to environmental cost had increased. For example, Marathon reported that its 2006 operating costs attributable to environmental compliance were about 28 percent higher than in 2005 (Marathon Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 51), while Valero reported that its 2006 environmental operating costs were approximately 13 percent higher than in 2005 (Valero Energy Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 85). Also see a recent EIA study that examined the effect of environmental compliance on operating costs, which is available on EIA’s Web site at http://www.eia.doe.gov/emeu/perfpro/ref_pi2/index.html.

Table 15. U.S. and Foreign Refining/Marketing^a Financial Items for FRS Companies, 2005-2006
(2006 Million Dollars)

	2005	2006	Percent Change 2005-2006
Domestic Refining/Marketing Operations			
Refined Product Sales Revenue	563,644	615,905	9.3
Other Revenue ^b	17,928	11,050	-38.4
Operating Expense ^{b, c}	551,773	593,107	7.5
Operating Income ^c	29,799	33,848	13.6
Net Income, excluding unusual Items	22,277	24,657	10.7
Unusual Items	-652	-344	--
Net Income	21,625	24,313	12.4
Foreign Refining/Marketing Operations^a			
Refined Product Sales Revenue	273,091	277,026	1.4
Other Revenue ^b	12,782	11,175	-12.6
Operating Expense ^{b, c}	276,224	278,479	0.8
Operating Income ^c	9,649	9,722	0.8
Net Income, excluding unusual Items	7,931	7,359	-7.2
Unusual Items	120	190	58.8
Net Income	8,050	7,549	-6.2

^aIn order to prevent disclosure of company-level data the International Marine business segment has been combined with Foreign Refining/Marketing for this presentation. Relative to Foreign Refining/Marketing, International Marine is about one-tenth the size and has little material effect on the overall results of Foreign Refining/Marketing.

^bRaw materials revenues are netted against total operating expense.

^cExcludes Unusual Items.

-- = Not meaningful.

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

Operational Changes

Retrenchment of marketing operations continued through both selective investment⁴⁶ in outlets in profitable areas and sales of marginal outlets,⁴⁷ which contributed to the \$0.15-per-barrel reduction in marketing costs between 2005 and 2006 (**Table 14**). In particular, branded marketing outlets directly supplied by the FRS companies declined again in 2006 (**Figure 22**), falling 9 percent to 38,797 (**Table 17**). Company-operated outlets were reduced (8 percent) in 2006, while dealer outlets were reduced slightly more, by 9 percent. Efforts to eliminate

⁴⁶ For example, Exxon Mobil has a strategy of “selective investment [that] is complemented by equally selective divestments that high-grade our asset base and optimize returns (2006 *Financial and Operating Review*, p. 71).” Shell Oil Company sold a number of assets in the United States during 2006 “[a]s part of [its] ... ongoing portfolio management (Royal Dutch Shell, 2006 *Annual Review and Summary Financial Statements*, p. 25).” Sunoco sold 338 retail sites during the 2004–2006 period “under a retail portfolio management ... program to selectively reduce the Company’s invested capital in Company-owned or leased sites, ... convert[ing the divested outlets] to contract dealers or distributors (Sunoco Inc., 2006 U.S. Securities and Exchange Commission Form 10-K, pp. 9–10).”

⁴⁷ Chevron indicated that its strategy is to increase its sales of motor fuel volumes “while reducing the number of company-owned sites in favor of ownership by third parties,” which resulted in a divestiture of more than 450 sites in 2006 and almost 2,800 outlets since the beginning of 2003 (Chevron Corporation, 2006 *Supplement to the Annual Report*, p. 51).” Exxon Mobil indicated that its corporate strategy is to combine selective investment and portfolio highgrading to increase its profitability of our business, which has reduced its number of retail service stations by nearly 20 percent since 2002 (Exxon Mobil Corporation, 2006 *Financial and Operating Review*, p. 71).

marginal outlets will tend to increase average productivity of the remaining outlets,⁴⁸ which is measured by the outlets' average monthly motor gasoline sales volume. This anticipated result was borne out by the changes in productivity between 2005 and 2006 of both company-operated and dealer outlets, which increased by 5 percent and 8 percent, respectively.

Table 16. U.S. and Foreign Refining/Marketing Investment and Refining Operating Items for FRS Companies, 2005-2006

	2005	2006	Percent Change 2005-2006
	(2006 Billion Dollars)		
U.S. Refining Additions to Investment in Place	15.0	11.0	-27.2
U.S. Marketing and Transportation Additions to Investment in Place	3.2	2.2	-32.5
Foreign Refining/Marketing Additions to Investment in Place	3.0	5.7	88.0
	21.3	18.9	-11.6
	(Thousand Barrels per Day)		
U.S. Refining Capacity	14,532	14,652	0.8
U.S. Refinery Output	15,039	14,726	-2.1
Foreign Refining Capacity	5,633	5,924	5.2
Foreign Refinery Output	5,134	5,164	0.6
	(Percent)		
U.S. Refinery Utilization Rate ¹	95.0	92.5	(2)
Foreign Refinery Utilization Rate ¹	89.0	88.2	(2)

¹Refinery utilization rate is calculated by dividing runs to stills at own refineries by the average of the year beginning and year ending crude oil distillation capacity.

²Not meaningful.

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

Meanwhile, refinery capacity reported by the FRS companies increased by almost 1 percent (**Table 16**) due to marginal expansions in the capacity of many refineries,⁴⁹ as the only transaction involving FRS U.S. refineries entailed CITGO's divestiture of its share of the Lyondell-CITGO refinery partnership to Lyondell Chemical,⁵⁰ making Lyondell Chemical the FRS respondent company rather than the joint venture. Additions to U.S. refining net investment in place included refinery upgrades, which were mainly to meet Phase II-compliant petroleum products⁵¹ or to increase the ability to process heavier and/or higher sulfur crude oil.⁵² The combination of

⁴⁸ However, some FRS companies have noted in the past that these efforts can be frustrated if productive dealers elect to change brands.

⁴⁹ For example, Chevron "completed an expansion of the Pascagoula, Mississippi, refinery's Fluid Catalytic Cracking Unit to increase the production of gasoline and other light products (Chevron Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 25)," ConocoPhillips' "[c]apital spending for R&M ... was primarily for acquiring additional crude oil refining capacity, clean fuels projects to meet new environmental standards, refinery-upgrade projects to improve product yields, the operating integrity of key processing units, as well as for safety projects (2006 U.S. Securities and Exchange Commission Form 10-K, p. 84)," and Exxon Mobil's "capital expenditures are focused on selective ... investments that ... enhance refinery capacity (Exxon Mobil Corporation, 2006 *Financial and Operating Review*, p. 68)."

⁵⁰ The sale closed on August 16, 2006, but was made retroactive to July 31, 2006 (Lyondell Chemical, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 1).

⁵¹ For example, Hess reported that "[c]apital expenditures to comply with low-sulfur gasoline requirements at Port Reading were \$72 million, of which \$23 million was spent in 2005 and the remainder was spent in 2006 (2006 U.S. Securities and Exchange Commission Form 10-K filing, p. 37), while Exxon Mobil reported "[d]ownstream capital expenditures were \$2.7 billion in 2006, up more than 9 percent versus 2005, reflecting the additional investment required to meet low-sulfur fuel and regulatory requirements (2006 *Financial and Operating Review*, p. 65)." Also see a recent EIA study that examined the effect of environmental compliance on capital expenditures (and operating costs), which is available on EIA's Web site at http://www.eia.doe.gov/emeu/perfpro/ref_pi2/index.html.

transactions, environmental investment, and turnaround spending resulted in a 27-percent decrease in U.S. refining additions to net investment in place (**Table 16**), chiefly due to the absence of any major acquisitions and, in some cases, to reduced capital investment for environmental compliance.⁵³ However, several companies noted substantial investment in various aspects of ethanol (production and blending)⁵⁴ and biodiesel (research, production, distribution, and storage)⁵⁵ as part of their environmental compliance investment.

Successful efforts to increase the complexity of the FRS refineries during the last several years (**Table 18**) allow the FRS companies to refine a wide range of crude oils, thus enabling them to take advantage of price differences between the relatively lower-cost heavy crude oils and the relatively higher-cost light crude oils⁵⁶ and transform them into relatively higher-priced, light products. The price of lighter products (represented by the price of motor gasoline) increased \$3.20 per barrel relative to the price of heavier products (represented by the price of residual

⁵² Several companies noted such investment. BP “announced that it had entered the final planning stage of a \$3-billion investment in Canadian heavy crude oil processing capability at its Whiting, [Indiana] ... refinery (BP plc, 2006 Annual Report on Form 20-F, p. 23).” Chevron announced in 2006 that it completed “an expansion of the Pascagoula, Mississippi, refinery’s Fluid Catalytic Cracking Unit to increase the production of gasoline and other light products” and began “construction projects ... at the El Segundo, California, refinery to increase heavy, sour crude oil processing capacity (Chevron Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 25).” ConocoPhillips stated that one of the major aims of its capital spending over a three-year period ending on December 31, 2006 was “refinery-upgrade projects to improve product yields (ConocoPhillips, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 84).” Exxon Mobil’s “capital expenditures ... lower operating costs, and produce higher-value products ... using lower-cost raw materials ... [in addition to expanding] refinery capacity and yield (Exxon Mobil Corporation, 2006 *Financial and Operating Review*, p. 68).” Marathon “[c]ompleted a 26,000 barrel per calendar day expansion of the Detroit, Mich., refinery (2006 *Fact Book*, p. 4).” Sunoco “initiated an alkylation process improvement project at its Philadelphia refinery’s HF alkylation unit (Sunoco Inc., 2006 U.S. Securities and Exchange Commission Form 10-K, p. 8).” Tesoro spent \$124 million during 2006 “transforming an existing fluid coker unit at the Golden Eagle refinery into a delayed coker (Tesoro Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 11).”

⁵³ For example, Marathon stated that its “[e]nvironmental expenditures for each of the last three years were: \$166 million, \$390 million, and \$433 million in 2006, 2005, and 2004, respectively (Marathon Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 51), while other companies reported higher capital spending due to environmental compliance, such as Exxon Mobil, which noted that “[d]ownstream capital expenditures were \$2.7 billion in 2006, up more than 9 percent versus 2005, reflecting the additional investment required to meet low-sulfur fuel and regulatory requirements (Exxon Mobil Corporation, 2006 *Financial and Operating Review*, p. 65),” and Lyondell, which reported that “[c]apital expenditures by Houston Refining (on a 100% basis) for regulatory compliance in 2006, 2005, and 2004 were \$134 million, \$106 million and \$31 million, respectively (Lyondell Chemical, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 79).”

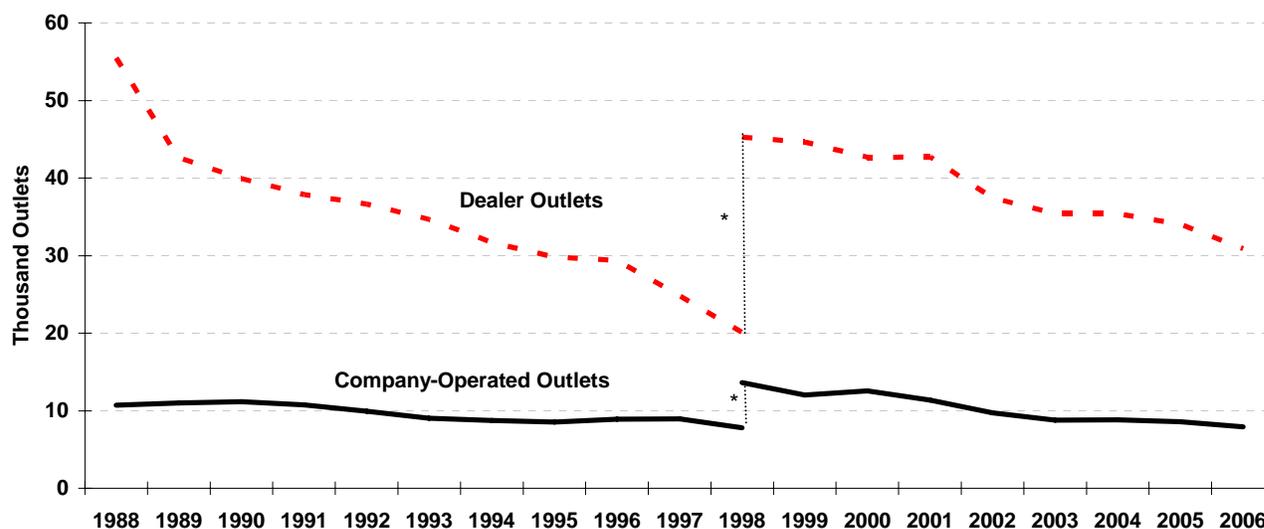
⁵⁴ Marathon “formed a 50/50 joint venture to produce ethanol (Marathon Corporation, 2006 *Annual Report*, p. 14),” while Exxon Mobil “installed a number of projects at our terminals in Texas, the Mid-Atlantic, and the Northeast to blend ethanol into motor gasoline to meet new U.S. renewable fuels standards (Exxon Mobil Corporation, 2006 *Financial and Operating Review*, p. 69).”

⁵⁵ Chevron acquired “a 22 percent interest in Galveston Bay Biodiesel L.P., which is building one of the first large-scale biofuel plants in the United States” and “entered into research alliances with the University of California, Davis, and the Georgia Institute of Technology” to convert “cellulosic biomass into viable transportation fuels (Chevron Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 30).” Additionally, Marathon “now has the capacity to store and distribute biodiesel at its Louisville, Kentucky, and St. Paul Park, Minnesota, terminals (Marathon Corporation, 2006 *Annual Report*, p. 14).”

⁵⁶ The efforts continue. For example, BP “announced that it had entered the final planning stage of a \$3-billion investment in Canadian heavy crude oil processing capability at its Whiting, [Indiana] ... refinery (BP plc., 2006 Annual Report on Form 20-F, p. 23).” Chevron announced in 2006 that it completed “an expansion of the Pascagoula, Mississippi, refinery’s Fluid Catalytic Cracking Unit to increase the production of gasoline and other light products” and began “construction projects ... at the El Segundo, California, refinery to increase heavy, sour crude oil processing capacity (Chevron Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 25).” ConocoPhillips noted that one of the major aims of its capital spending over a three-year period ending on December 31, 2006, was “refinery-upgrade projects to improve product yields (ConocoPhillips, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 84).” Exxon Mobil indicated that its “capital expenditures are focused on ... investments [to] ... lower operating costs, and produce higher-value products ... using lower-cost raw materials (2006 *Financial and Operating Review*, p. 68).” Tesoro indicated that it spent \$124 million during 2006 for transforming an existing fluid coker unit at the Golden Eagle refinery into a delayed coker (Tesoro Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 11).

fuel oil) (Figure 23). Similarly, during 2005 the price of light crude oil relative to heavy crude increased (Figure 24), raising the discount paid for heavy crude oil from \$15.84 per barrel in 2005 to \$16.03 per barrel in 2006, both in terms of 2006 dollars. These price movements favored companies with complex refineries and provided additional incentives for companies to expand their capability to process heavy crude oil.

Figure 22. Company-Operated and Direct-Supplied Dealer Outlets for FRS Companies, 1988-2006



*The addition of 11 companies to the group of U.S. majors in 1998, the largest single-year change in the history of the Financial Reporting System, resulted in the vertical displacement of the series in 1998.

Note: Only outlets directly supplied by the FRS companies are included here.

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

Table 17. Motor Gasoline Distribution and Number of Direct-Supplied Branded Outlets for FRS Companies, 2005-2006

	2005	2006	Percent Change 2005-2006
	(Million Barrels)		
Third-Party Volume			
Wholesale	2,221.1	2,119.5	-4.6
Retail			
Dealer	845.3	828.4	-2.0
Company-Operated	503.6	487.2	-3.3
Total Retail	1,349.0	1,315.6	-2.5
Direct	644.1	589.4	-8.5
Total Third-Party Volume	4,214.2	4,024.5	-4.5
Intersegment Volume	63.7	59.8	-6.0
	(Number of Direct-Supplied Branded Outlets)		
Dealer Outlets	33,998	30,870	-9.2
Company-Operated Outlets	8,585	7,927	-7.7
Total Retail Outlets	42,583	38,797	-8.9
	(Thousand Gallons per Month)		
Average Monthly Outlet Volume			
Dealers	87.0	93.9	7.9
Company-Operated	205.3	215.1	4.8
All Direct-Supplied Outlets	110.9	118.7	7.0

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

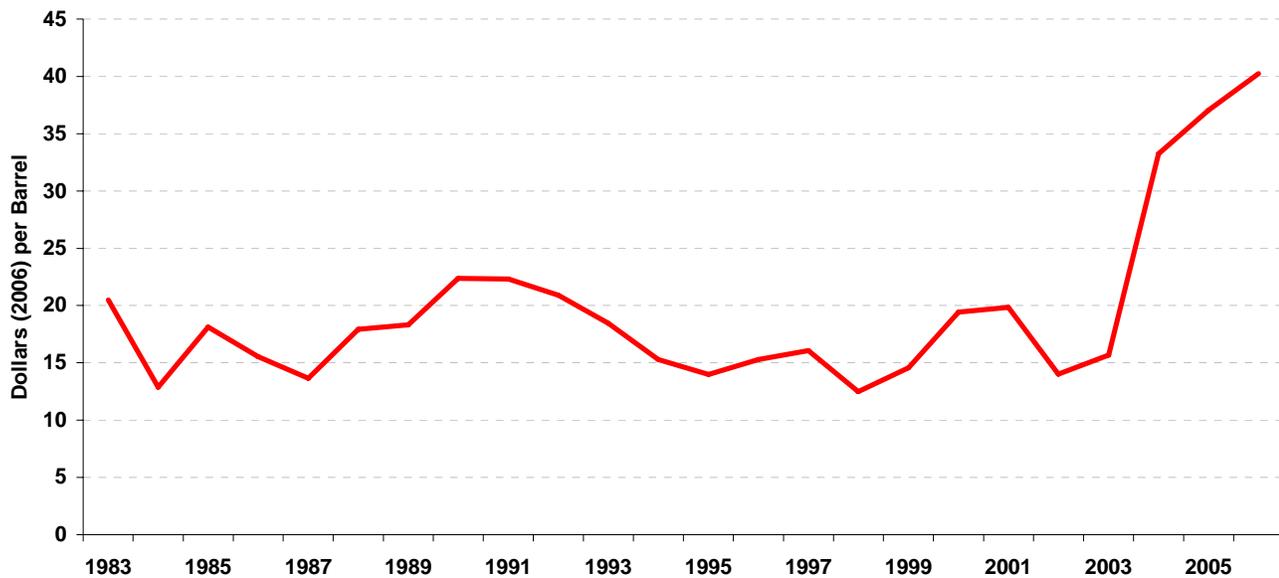
Table 18. U.S. Refinery Configurations of FRS Companies, Selected Years, 1974-2006
(Percent)

FRS Companies	Downstream Capacity as a Percent of Crude Distillation Capacity												
	1974	1981	1993	1996	1997	1999	2000	2001	2002	2003	2004	2005	2006
Integrated Refiners													
Coking	n.c.	n.c.	n.c.	13.0	12.6	12.9	13.9	14.1	15.8	15.4	15.7	15.4	15.4
Catalytic cracking	27.7	30.4	36.5	33.8	35.9	35.8	35.6	35.2	33.0	33.4	33.7	33.7	33.9
Catalytic reforming	17.6	22.4	25.8	24.9	23.4	22.3	22.4	22.2	21.8	21.8	21.8	21.4	21.7
Hydro cracking	5.6	5.7	9.6	9.6	9.6	10.9	11.0	10.9	10.7	10.4	10.7	10.5	11.0
Catalytic hydrotreating	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	79.5	82.3	85.8
Alkylation	4.8	5.3	7.7	6.8	7.5	7.4	7.4	7.2	7.1	7.2	7.3	7.3	7.5
Non-Integrated Refiners (includes CITGO and Motiva)													
Coking	n.c.	n.c.	n.c.	11.0	12.7	12.0	12.1	12.4	12.0	13.5	14.7	14.3	14.4
Catalytic cracking	n.c.	n.c.	n.c.	29.8	34.1	34.0	35.5	35.5	36.3	36.7	38.4	37.2	37.2
Catalytic reforming	n.c.	n.c.	n.c.	18.9	21.5	22.5	21.9	21.7	21.4	21.1	21.8	20.4	20.1
Hydro cracking	n.c.	n.c.	n.c.	6.3	7.8	8.6	8.6	8.4	7.8	8.5	8.7	8.1	8.3
Catalytic hydrotreating	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	71.4	72.7	73.7
Alkylation	n.c.	n.c.	n.c.	6.0	6.8	6.0	6.3	6.3	6.4	6.4	6.9	6.6	6.6

n.c.: Information not collected.

Sources: Oil and Gas Journal, "Worldwide Refinery Report," 1974, 1981, 1993, 1996, 1997, 1999, 2000, 2001, 2002, 2003, 2004, 2005, and 2006.

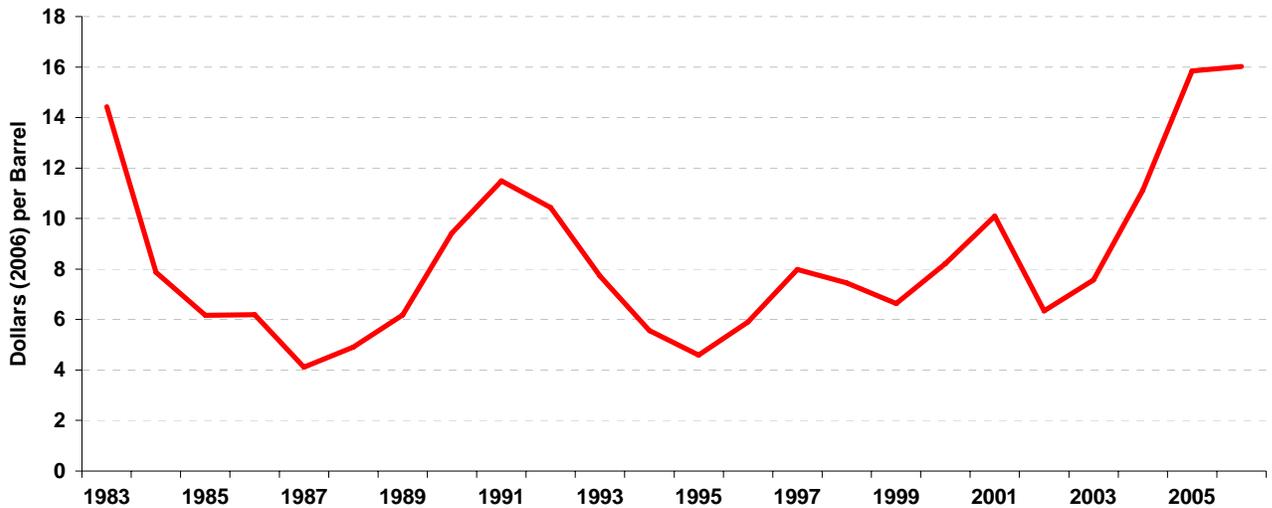
Figure 23. Resale Price Difference Between Motor Gasoline and Residual Fuel Oil, 1983-2006



Note: Motor gasoline tends to sell for a higher price per barrel than does residual fuel oil. Thus, the vertical distance of the line in the figure from the horizontal axis indicates the premium paid for motor gasoline relative to residual fuel oil.

Source: Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380, Table 4.

Figure 24. Price Difference Between Light Crude Oil and Heavy Crude Oil, 1983-2006



Note: Light crude oil tends to sell for a higher price per barrel than does heavy crude oil. Thus, the vertical distance of the line in the figure from the horizontal axis indicates the premium paid for light crude oil relative to heavy crude oil. The more expensive light crude oil is defined here as having an API gravity of 40.1 or greater and heavy crude oil is defined as having an API gravity of 20 or less.

Source: Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380, Tables 27 and 28 (2006 and earlier), and Tables 24 and 25 (2007).

The year 2006 was the most profitable in the 30-year history of the FRS and followed a recent series of unusually profitable years, which were broken in 2002 by the most unprofitable year in the history of the FRS. The primary reason for the increased profitability of the FRS U.S. refining/marketing operations in 2006 relative to 2005 was that the gross refining margin increased (by \$1.92 per barrel), while operating costs increased less (by \$0.25 per barrel). Decreases in energy costs and marketing costs (by a total of \$0.29 per barrel) were overwhelmed by higher other operating costs (which increased by \$0.54 per barrel). The combination of these changes resulted in an increase of \$1.67 per barrel in the net refining margin, which was a 46-percent increase relative to 2005. FRS cost-cutting efforts have been less successful over the last several years but continue through actions such as rationalization of the FRS companies' motor gasoline retailing operations (and the resulting decline in marketing costs) and suggest that the FRS companies continue to attempt to withstand the vicissitudes of their industry by focusing on the factors that they can most easily control.

Foreign Refining/Marketing⁵⁷

Four years after recording the lowest profitability (-1 percent) in the 30-year history of the FRS, companies reported the fourth-highest all-time high for return on net investment in place of foreign refining/marketing operations. The average profit rate of 19 percent was 2 percentage points lower than in 2005, which was the second-highest in the history of the FRS (**Figure 18**). Refined product and other revenue increased by slightly more than \$2 billion relative to 2005, but were largely offset by more than a \$2-billion increase in operating expense, resulting in less than a \$100-million increase (1 percent) in operating income and a \$500-million decrease (6 percent) in net income (**Table 15**).

⁵⁷ For this presentation, the International Marine business segment has been combined with Foreign Refining/Marketing to prevent disclosure of company-level data. Relative to Foreign Refining/Marketing, International Marine is about one-tenth the size and has little material effect on the overall results of Foreign Refining/Marketing.

The FRS companies derive their foreign refining/marketing earnings from two sources: consolidated operations and unconsolidated affiliates. A fully consolidated affiliate is directly controlled by the parent corporation (although it could be owned by several companies, with the parent corporation owning more than 50 percent). In addition, all operating financial information about a fully consolidated affiliate (such as revenues) is reported in the public financial disclosures of the parent corporation. Conversely, the corporate parent of an unconsolidated affiliate usually owns 50 percent, or less, of the affiliate, and does not directly control the affiliate⁵⁸ (a joint venture, for example, is usually an unconsolidated affiliate from the perspective of at least one of the partners⁵⁹). Essentially, the unconsolidated affiliate is more of a property or holding of the parent corporation than a company that the parent actually operates. The effect on financial operations of an unconsolidated affiliate can be seen only on the parent corporation's income statement, on which the parent company reports its proportional share of the affiliate's net income.

Historically, approximately half of the FRS consolidated foreign refinery capacity is located in Europe, 52 percent in 2006, with most of the remaining consolidated refinery capacity in Asia. Meanwhile, the operations of the FRS companies' unconsolidated foreign refining/marketing affiliates have been mainly in Asia. Chevron owns much of the FRS Asian refinery capacity, most of which is unconsolidated. In fact, 71 percent of FRS unconsolidated foreign refinery capacity was in Asia in 2006 (**Table 19**).

Table 19. Regional Distribution of Foreign Refinery Capacity for FRS Companies, 2005-2006
(Percent)

	Consolidated Operations		Unconsolidated Affiliates	
	2005	2006	2005	2006
Europe	48.7	51.7	16.9	16.4
Asia	25.7	24.2	68.5	70.7
Latin America	9.0	8.5	0.6	0.3
Canada	14.1	13.3	0.0	0.0
Other	2.5	2.4	13.9	12.7
Grand Total	100.0	100.0	100.0	100.0

Note: The region denoted as "Other" includes Africa and the Middle East.
Sources: Company Annual Reports and filings of U.S. Securities and Exchange Commission Form 10-K.

The decrease in net income between 2005 and 2006 in FRS foreign refining/marketing operations was due to a decrease in income from unconsolidated operations and despite an increase in income from consolidated operations (**Figure 25**). The former decreased by \$620 million, while the latter increased by \$372 million. Worldwide petroleum demand increased (**Figure 26**) by less than 1 percent, contributing slightly to greater earnings. Additionally, the companies identified numerous reasons for the decreased profitability of FRS unconsolidated and overall foreign refining/marketing operations in public statements, including reduced refining margins,⁶⁰ lower refinery utilization rates⁶¹ and throughput,⁶² and costs incurred ahead of completion of refinery upgrading (i.e., increased cost with no offsetting change in revenues) operations,⁶³ despite increased sales volumes,⁶⁴ margins received,⁶⁵ and refinery capacity (**Table 16**).

⁵⁸ The actual percentage of ownership necessary to convey control of an entity is open to debate and, for some purposes, can be as little as 10 percent.

⁵⁹ The Caltex joint venture was an unconsolidated affiliate for both of its parents, Chevron and Texaco, until their merger in 2002. However, most of the refinery capacity of Caltex (which was retained as an operating entity) is unconsolidated because Caltex generally owns less than 50 percent of each refinery in which it has ownership.

⁶⁰ ConocoPhillips, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 65.

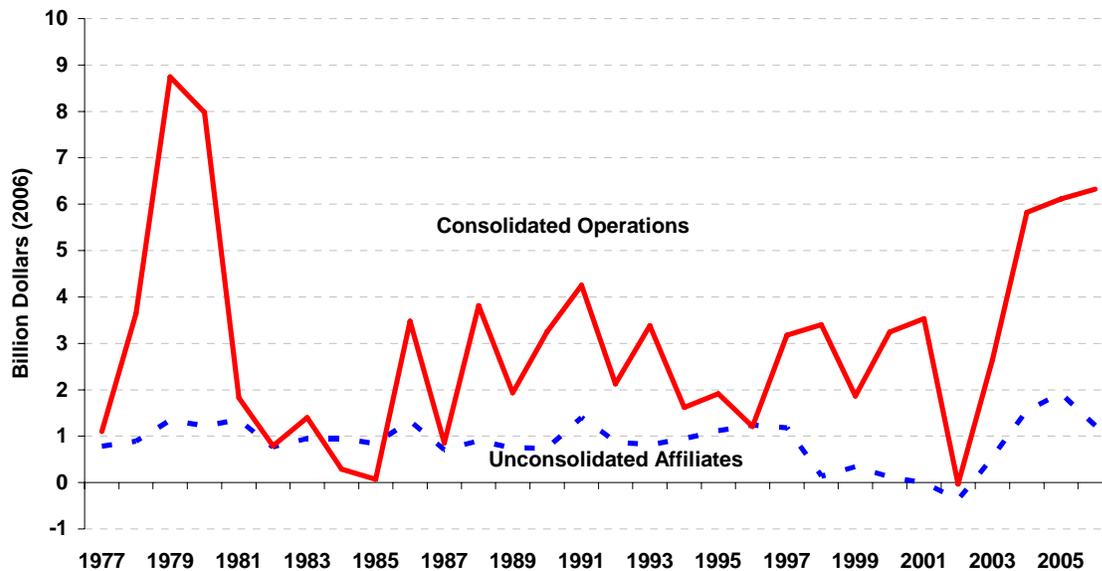
⁶¹ ConocoPhillips, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 65.

⁶² Exxon Mobil Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 38.

⁶³ ConocoPhillips, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 65.

⁶⁴ ConocoPhillips, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 65.

Figure 25. Foreign Refining/Marketing Net Income^a from Consolidated Operations and Unconsolidated Affiliates of FRS Companies, 1977-2006



^aThe International Marine business segment has been combined with Foreign Refining/Marketing for the years 2003 - 2005 in order to prevent disclosure of company-level data. Relative to Foreign Refining/Marketing, International Marine is about one-tenth the size and has little material effect on the overall results of Foreign Refining/Marketing.

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

Consolidated Operations

Earnings from the FRS companies' consolidated operations increased (**Figure 25**) about \$372 million (3 percent) between 2005 and 2006, providing \$6,323 million of net income. The FRS consolidated operations generated higher earnings by selectively upgrading (or expanding the number of) marketing outlets,⁶⁶ reducing its costs by divesting non-core retail assets⁶⁷ and expanding refinery capacity.⁶⁸

Higher earnings from consolidated FRS foreign refining/marketing operations occurred within a difficult industry environment of lower refining margins and essentially unchanged (**Figure 26**) (0.3 percent lower) European petroleum demand. Further, European refining margins (represented by the Rotterdam/Brent gross refining margin) were consistently lower during 2006 than during 2005 (**Figure 27**), without exception. As a result, the average margin for all of 2006 was \$1.94 per barrel lower than the average margin for 2005.

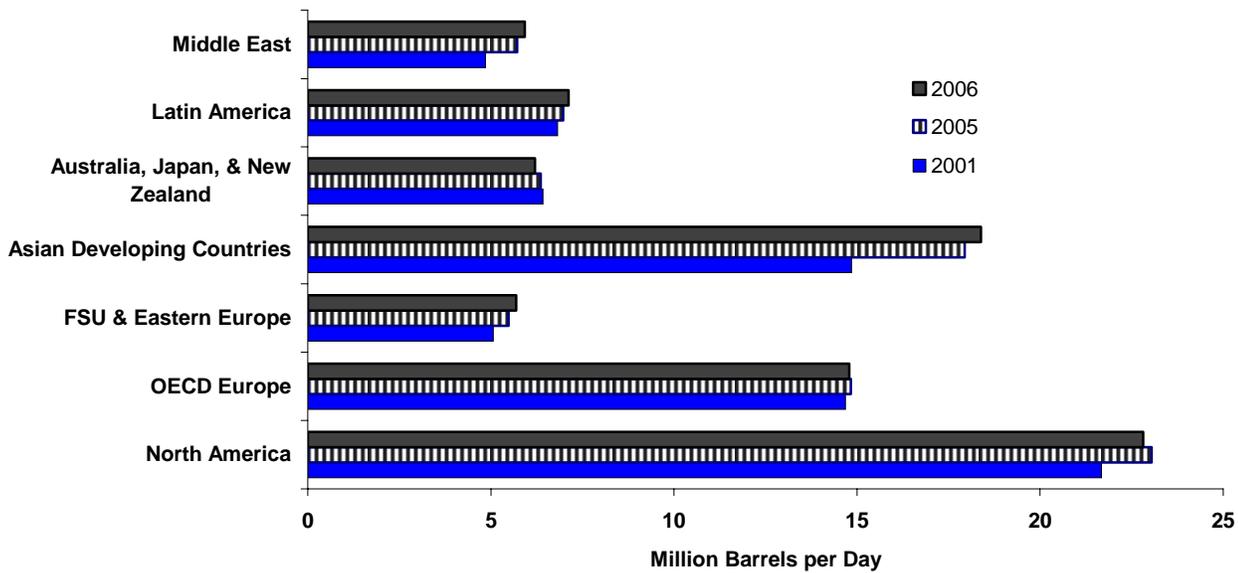
⁶⁵ Chevron Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. FS-8 and Exxon Mobil Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 38.

⁶⁶Exxon Mobil "is ... build[ing] premier oil-change service centers in key markets around the globe, including the United States, Japan, Egypt, and China (Exxon Mobil Corporation, 2006 *Financial and Operating Review*, p. 73)."

⁶⁷Chevron "[e]xited fuels marketing ... in Scandinavia, Paraguay and Ecuador ... [and] sold its 50 percent share in the Hydro Texaco joint venture and its network of service stations across Scandinavia (Chevron Corporation, 2006 *Supplement to the Annual Report*, pp. 49 and 51)."

⁶⁸ For example, ConocoPhillips acquired "the Wilhelmshaven refinery in Germany, ... [and] upgrade[d] and increase[d] the profitability of ... [its] existing assets, including a replacement reformer at ... [the] Humber refinery in the United Kingdom (2006 U.S. Securities and Exchange Commission Form 10-K, p. 84)." Meanwhile, Exxon Mobil "increase[d] the capacity of ... [its] refineries through low-cost debottlenecks (Exxon Mobil Corporation, 2006 *Financial and Operating Review*, p. 67)."

Figure 26. Petroleum Consumption by Region, 2001, 2005, and 2006



Note: OECD stands for the Organisation for Economic Co-operation and Development.
 Source: BP plc, *BP Statistical Review of World Energy* (June 2007), p. 11.

Unconsolidated Operations

During 2006, the FRS companies' unconsolidated affiliates generated \$1,226 million of net income, which was 36 percent lower than the all-time high of \$1,919 million (in 2006 dollars), which was established in 2005. Company public disclosures included some reasons for the lower earnings generated by the Asian operations of the FRS companies, which included increased taxes⁶⁹ and lower refinery throughput,⁷⁰ despite higher margins reported⁷¹ by some companies.

Lower earnings occurred in a mixed industry environment. Consumption of petroleum products in Asia (combining Asian Developing Countries with Australia, Japan, and New Zealand) increased between 2005 and 2006 (**Figure 26**) by a slight 1 percent. However, higher industry-wide refining margins put scant upward pressure on earnings for FRS unconsolidated foreign refining/marketing operations.

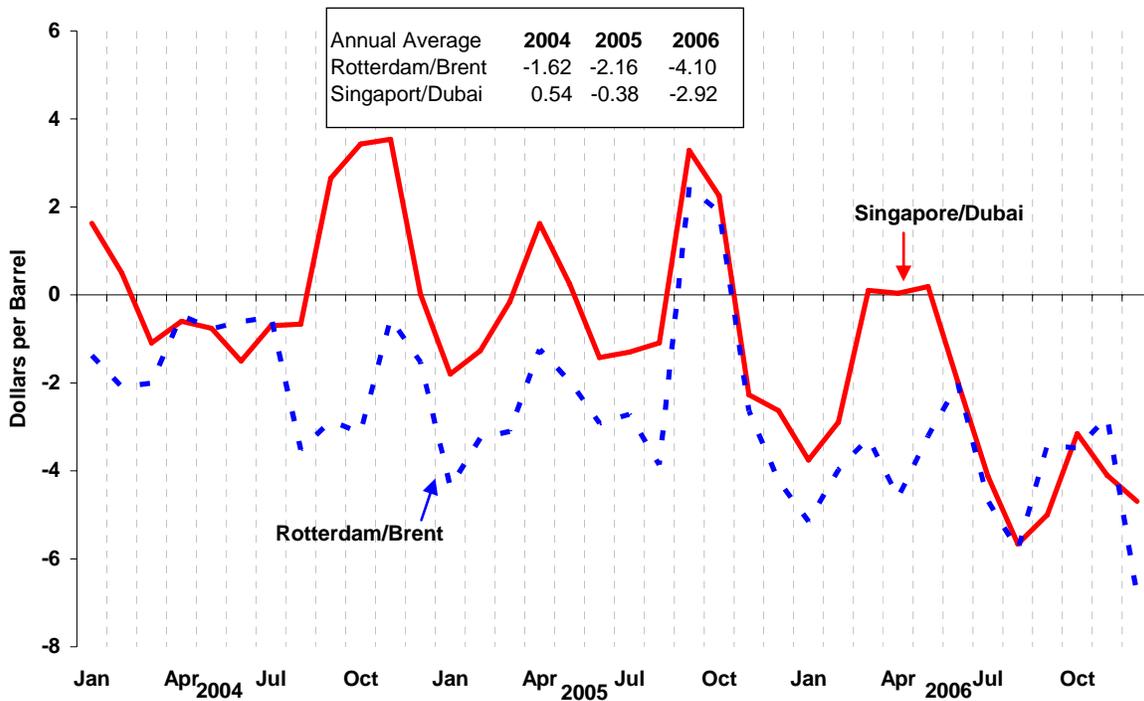
However, industry-wide Asian refining margins of 2006 were lower than those of 2005 for almost the entire year (**Figure 27**) (except for June). The mid-year increase in refining margins (relative to 2005) was insufficient to elevate the average annual gross refining margin in Asia (represented by the Singapore/Dubai gross refining margin) for 2006 above that of 2005, leaving it \$2.54 per barrel lower, which put downward pressure on the earnings from unconsolidated operations.

⁶⁹ ConocoPhillips, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 60.

⁷⁰ Exxon Mobil Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 38.

⁷¹ Chevron Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. FS-8 and Exxon Mobil Corporation, 2006 U.S. Securities and Exchange Commission Form 10-K, p. 38.

Figure 27. Foreign Gross Refining Margins, 2004-2006



Sources: Energy Intelligence Group, *Oil Market Intelligence* **2004**: January 2005 and July 2004, p. 12; **2005**: January 2006 and July 2005, p. 12; and **2006**: January 2007 and July 2006, p. 12.

FRS companies' foreign refining/marketing earnings decreased slightly due to essentially unchanged petroleum product consumption and a decrease in industry gross refining margins in both major regions in which the FRS companies operate—Europe and Asia. However, expansion and enhancement of operations and cost-cutting measures figured prominently in the increased consolidated earnings (relative to 2005) and near-record profitability of FRS foreign refining/marketing operations in 2006.

