Uncle Sam at the Gas Pump

Causes and Consequences of Regulating Gasoline Distribution

Severin Borenstein and Richard Gilbert

The gasoline distribution industry has attracted more than its share of legislation to regulate prices and the means of supply. The Petroleum Marketing Practices Act of 1978 restricts the ability of integrated refiners—those oil refining companies that have both company-operated and franchised retail stations—to terminate franchise agreements and prohibits their subsidizing gasoline marketing operations with funds from other petroleum-related operations. Five states have enacted laws that entirely prohibit gasoline refiners from directly operating retail gasoline stations.

Recently, both the House and Senate have proposed legislation to "enhance" competition in the gasoline distribution industry. Those proposals generally require an integrated refiner to set prices at its company-operated retail stations above its wholesale prices by the full cost of retail distribution and marketing. The bills are supposed to enhance competition by protecting independent gasoline retailers from alleged predatory behavior by integrated refiners. In the absence of such legislation, the proponents argue, integrated refiners will squeeze retail margins to the point that they will drive the independent retailers out of business. Thus, the bills would also prohibit any attempt by an integrated refiner to limit or reduce the retail prices that its franchised dealers charge.

The arguments made to support the bills are flawed in both economic reasoning and interpretation of the facts. Furthermore, the possible disruptions of efficient market operation that could result from the proposed bills range from intermittent inconvenience and above-cost pricing to long-run inefficiencies that would cause higher prices and possible supply disruptions.

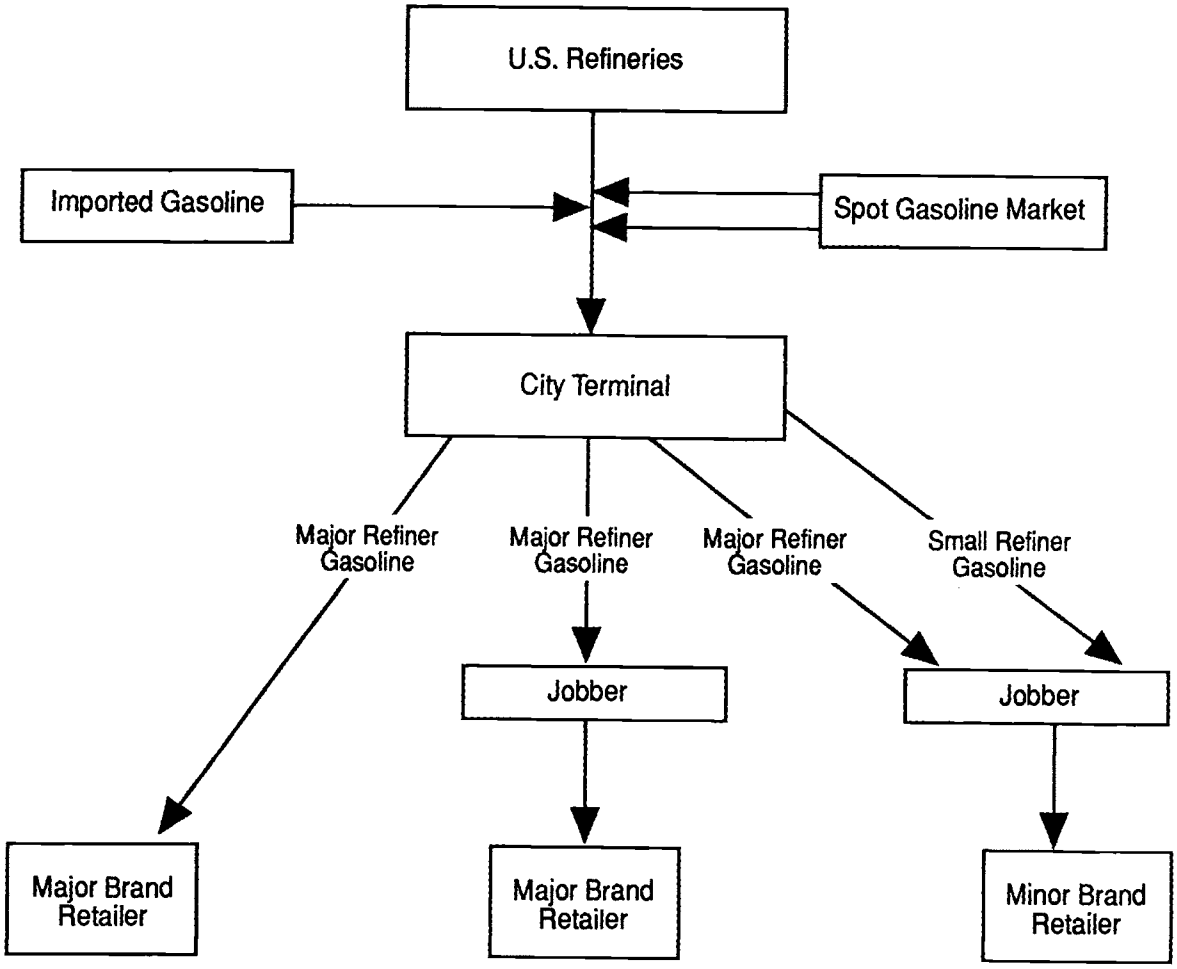
From the Refinery to the Pump: A Description of the Gasoline Market

Nationwide there are about 200,000 retail establishments that sell motor gasoline. About 120,000 of them are major-brand stations—Exxon, Chevron, Shell, or one of more than a dozen other well-known brands that are associated with a large oil refining company. The remainder are minor-brand stations: the brand name under which they operate is not so well known and is not associated with a large refiner.

In the United States more than 100 refining companies together produce 95 percent of the gasoline consumed. The remainder is imported. The 15 largest companies produce 82 percent of the total domestic production, but no one company has a share over 9 percent. Nine compa-

Severin Borenstein is an associate professor of economics at the University of California at Davis and a research assistant of the National Bureau of Economic Research. Richard Gilbert is a professor of economics at the University of California at Berkeley.

Figure 1: Gasoline Distribution Possibilities



nies—Shell, Chevron, Texaco, Exxon, Amoco, Mobil, BP America, Marathon, and Citgo—each have market shares between 5 percent and 9 percent.

Refiners depend on several distribution channels to deliver gasoline to market, as we illustrate in Figure 1. To begin with, they can sell gasoline from the refinery in bulk quantities. Industry observers closely monitor those "spot market" sales, and the industry press reports the spot prices for generic unleaded gasoline daily. Refiners distribute most of their gasoline production, usually by pipeline, to their city terminals, which are essentially large gas stations for gasoline delivery trucks. At the terminal, a refiner may sell its gasoline to an independent wholesaler (known as a "jobber") or load it onto the refiner's own trucks for delivery either to independently operated brand-name stations that are directly supplied by the refiner or, if the refiner is vertically integrated, to stations the refiner directly operates.

All of the 15 largest oil refining companies are vertically integrated down to the retail level, although none operates even half of its brand-name stations directly. Figure 2 shows the breakdown of retail gasoline distribution channels from the city terminal for the major integrated petroleum companies. The fully vertically integrated form of distribution, where gasoline is

sold in a station directly operated by a major refiner, accounts for 16 percent of their gasoline sales. About 31 percent of the gasoline sold by the majors is directly supplied—delivered by the refining company to stations that carry the refiner's brand name but are operated independently. A small proportion is sold to bulk purchasers, such as taxi fleets and auto rental companies.

Refiners sell the remaining supply to jobbers at the terminal. The majority of that gasoline is then resold through stations that carry the refiner's brand name but are owned by a jobber or by an independent retailer that the jobber supplies. A substantial share, however, is sold through minor-brand stations that are not affiliated with a major refiner. That is, a jobber might buy gasoline from a Shell terminal not just to supply Shell stations, but also to supply the Quiktrip stations that the jobber services (and may own or operate). A refiner permits such use provided that its name is not used to sell the product through those outlets. Because of that practice, however, refiners are never completely certain how much gasoline is being sold through their brand-name, but jobber-supplied, stations.

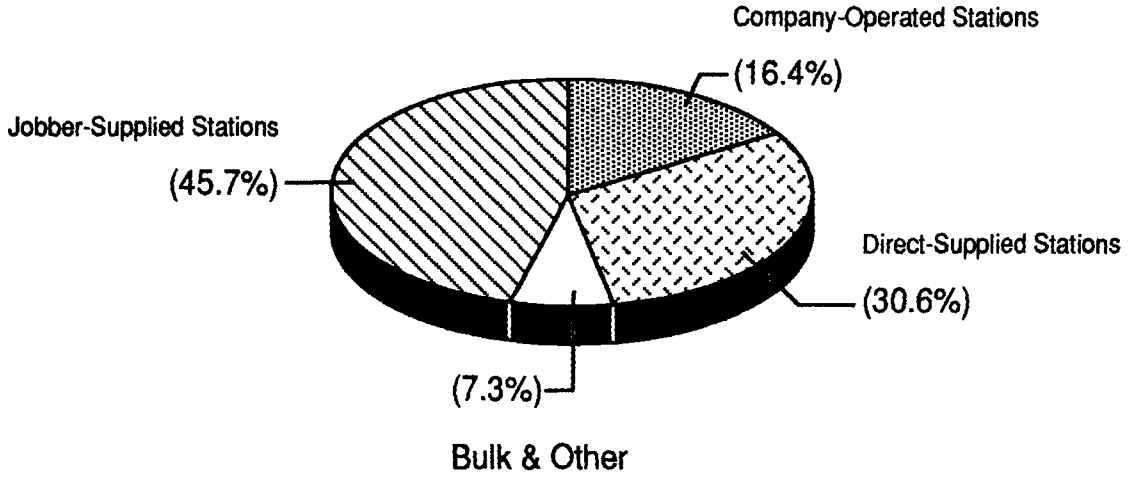
Some refiners are not vertically integrated and have no brand-name stations. They therefore sell virtually all of their output in the spot market or to independent jobbers at city terminals. Tosco Corporation, for instance, has 25 city terminals and is about the 30th largest refining company in the country. But there are no service stations that bear its name. The major integrated refiners require that all gasoline retailed under their brand name be purchased from them, so gasoline sold at a terminal by other refiners must be resold through minor-brand gasoline stations, for example, Cumberland Farms, Quiktrip, or Thrifty.

Why do major refiners use mixed systems of distribution—operating some stations directly, selling some gasoline through major-brand independents, and selling some to jobbers, who then resell through both brand-affiliated and minor-brand independent stations? The reasons are practical, legal, and historical.

The franchising approach has the same attraction that it has in the fast-food and other industries: it allows the parent company to put more of the financial responsibility and reward on the outlet operator. Thus it reduces the need for centralized monitoring and allows the parent company to tap sources of capital that would otherwise not be available. Most of the jobber-operated or jobber-supplied stations were built

Figure 2: Distribution Channels for Retail Sales of Gasoline by Integrated Refiners

(Percentage shares by volume)



decades ago without any financial participation from the major refiner with which the station is affiliated. Independently operated stations that are directly supplied by the refiner are typically owned by the refiner, but are leased to an operator who bears the profit and loss from the station's business. Local ownership also increases the support the business is likely to get from the local community because of personal relationships with the owner.

Selling gasoline through an independent downstream company also has significant drawbacks. The most important of those is the lack of direct company control over retail prices, which leads to a problem of "double marginalization." When the downstream retailer imposes a high margin on the product, the resulting decrease in volume harms the upstream refining company by reducing the quantity sold and the profits earned by the refiner from its own margin. The law prohibits refiners from setting retail prices at their independent major-brand dealers. With incentive programs a refiner can still encourage low retail prices by giving volume discounts to its name-brand independent dealers, but the bills currently under consideration in Congress would ban such discounts. Independent dealers may also have less incentive to maintain the brand-name reputation. They may cut corners on service or cleanliness to increase short-run profits. Those problems are reduced when the refiner owns the downstream distribution outlets—but at the cost of increased monitoring and capital requirements.

When the downstream retailer imposes a high margin on the product, the resulting decrease in volume harms the upstream refining company by reducing the quantity sold and the profits earned by the refiner from its own margin.

The pros and cons of each arrangement lead to a mixed distribution system, because the factors carry different weights in different locations and retail configurations. If a station offers auto maintenance and repair, for instance, the cost of centralized decisionmaking and employee monitoring can be prohibitive, because the repair service is idiosyncratic and difficult to routinize. In general, when the tasks of the station attendants are simpler and more easily monitored—such as running a cash register or stocking shelves of a convenience store—the arguments for company operation of the station are more likely to prevail.

Lastly, when a major refiner finds itself with sufficient product, it may also sell gasoline for resale in minor-brand stations—without permitting any reference to the major's name. That approach has none of the costs of integration or brand-name independent dealers, but it also offers none of the return to participating in the downstream retail market.

Using a mix of distribution channels is common in retailing. In cases of franchised retail distribution, it is common for the manufacturer to own some outlets itself. McDonald's franchises most of its outlets, but directly operates 28 percent, which is slightly below average for the fast-food industry as a whole. The practice of operating some outlets directly is also common in the convenience store and hotel industries. Similarly, many producers of consumer goods—such as groceries—sell their product both under their own brand name and to other companies for resale under minor-brand names.

The Decline of the Independent Major-Brand Dealer

The gasoline distribution industry has gone through dramatic changes in the past two decades. The traditional neighborhood service station with full-service gasoline sales and auto repair bays is no longer the dominant gasoline retailing configuration. Two types of gasoline retailers have emerged to replace it: "pumper" stations that have a dozen or more self-service gas pumps operated by a single cashier, possibly with a small convenience store or car wash attached, and convenience stores that also operate self-service gasoline pumps as a secondary revenue source. The latter arrangement is less often associated with a major-brand refiner.

Both of the growing retail configurations have coincided with the nearly complete transformation from full-service to self-service retail gasoline delivery. Self-service gasoline sales have grown from a negligible share of retail volume in the early 1970s to 83 percent in 1990. One study of metropolitan areas found that pumper stations now constitute more than one-

third of all stations and just over half of all retail gasoline volume. Service stations with repair bays—the dominant retail form until the early 1980s—are down to nearly one-third of the market in both outlets and volume. Convenience stores that also sell gasoline as a secondary revenue source now constitute about one-fifth of all outlets but sell only about one-tenth of all gasoline volume. The remaining volume is distributed through other businesses for which gasoline is not the primary product, such as car washes and garages. Those numbers overstate the importance of pumpers—owing to the urban focus of the survey—but they still show clearly that the day of the traditional full-service gas station and repair garage is ending.

The traditional stations are losing out not just on the gasoline side, but also in the auto repair market. Newer vehicles require less routine maintenance as well as more sophisticated major service than their older counterparts. In addition, stations have faced increasing competition from specialized auto service vendors, such as Jiffy Lube, for routine maintenance, and from auto parts chains for the sale of oil, tires, windshield wipers, and other replacement parts. Overall, the proportion of gasoline retailers offering repair and maintenance services fell from nearly 70 percent in 1978 to about 40 percent in 1986.

The traditional stations—generally the oldest—were also the ones most severely affected by changing environmental regulations. Stringent Environ-mental Protection Agency regulations that went into effect in the past decade required replacement of underground storage tanks that did not meet high environmental standards. The resulting costs fell disproportionately on the stations that had been around the longest and had been built with the fewest environmental safeguards. Once a station was to be completely disrupted and dismantled, it often made no economic sense to rebuild the same type of gasoline retail outlet. In many cases those outlets simply disappeared or were reconstructed as pumper stations or convenience store outlets, with no service bays.

Historically, independent major-brand gasoline retailers have been the primary providers of the services that are now going out of fashion. They have been more likely to operate low-volume, full-service facilities with repair bays. The presence of repair bays has made refiners hesitant to operate a station directly because of the high monitoring costs and the need for independent decisionmaking that is associated with the auto repair business. Minor-brand dealers pursued a different marketing strategy by pioneering no-frills, self-service gasoline retailing. At the same time, the major oil companies chose to operate most of their pumper stations directly, because the labor required at such stations is less discretionary and easier to monitor.

Between 1980 and 1990 the number of major-brand independently operated stations declined by nearly 40 percent from about 180,000 to 110,000.

Thus, as low-volume, high-service gasoline retailing has given way to high-volume, low-service delivery configurations, the major-brand independent dealers have taken the biggest hit. The numbers bear this out: between 1980 and 1990 the number of major-brand independently operated stations declined by nearly 40 percent from about 180,000 to 110,000. Company-operated stations of the major brands grew gradually during that time—from about 8,000 to about 11,000.

The major-brand independents that have disappeared are typically the lowest-volume sellers. Average monthly volume among major-brand independent stations that are directly supplied by the refiner more than doubled between 1982 and 1990—from 27,000 gallons to 60,000 gallons per month—as the number of such stations declined from about 90,000 to about 40,000. (These data are just for direct-supplied stations. As explained above, volumes for jobber-supplied major-brand stations are not known.) Over the same time period, the average volume at a company-operated major-brand station has increased only moderately, from 114,000 to 120,000 gallons per month.

The total number of retail gasoline outlets declined in the early 1980s but has increased more recently as minor-brand dealers and convenience stores have expanded in numbers. The best estimates indicate that the total number of retail outlets is about the same now as in 1972—around 200,000—but that virtually all outlets

sold gasoline as their primary product in 1972, while as many as half now obtain most of their revenues from other sources.

Accusing Big Oil

Independent dealers of major-brand gasoline have protested that the fall in their numbers is part of a conspiracy by integrated refiners to squeeze out independent retailers and to monopolize the retail segment of the industry with vertically integrated stations. Minor-brand marketers also have argued that retail shares of major-brand outlets are increasing in many areas and that the end result will be noncompetitive retail markets dominated by stations that the major integrated refiners control. Data are not generally available for cities, but state data are useful in states with only one major metropolitan area. In Massachusetts the top four brands constituted 63 percent of the retail outlets in 1990—up from 45 percent in 1980. In Washington, D.C., the top-four share increased from 68 percent to 86 percent, and in Rhode Island, the change was 47 percent to 83 percent. There are, however, many other states in which concentration declined during the 1980s, such as Minnesota, where the top-four share of outlets dropped from 58 percent to 54 percent during the 1980s, Georgia (55 percent to 47 percent), and Washington (61 percent to 59 percent). Changes in the concentration of sales are unclear, especially when we recognize that many new minor-brand outlets that sell gasoline as a sideline are probably omitted from the tallies.

Intrabrand as well as interbrand rivalry ensures substantial price competition at the retail level of the gasoline market.

More important, the numbers obscure the extent of competition in retail gasoline due to intrabrand rivalry. Although directly operated stations are increasing in number, they still represent only about 10 percent of the stations that sell the major brands. While some jobbers may operate more than one station, the number of separate suppliers of a single brand is large enough to ensure intense competition at the retail level. Even if the four largest retailers in the District of Columbia directly operate 20 percent of their stations, the four-firm retail concentration ratio in outlets is actually 17 percent rather than 86 percent.

Thus, intrabrand as well as interbrand rivalry ensures substantial price competition at the retail level of the gasoline market. Can the exercise of market power at the wholesale level explain the declining margins about which the independents complain? Market power at that level would be evidenced in a high terminal price for sales to independent dealers or in a high retail price for integrated refiners. The independents are arguing that retail prices at company-operated stations are excessively low, not excessively high. As for terminal prices, they are highly variable. But when we correct for inflation, they show no upward trend relative to crude prices during the 1980s. Recent trends in both the retail and wholesale prices integrated refiners charge are not consistent with a claim of increasing market power.

Moreover, a refiner intent on exercising market power at the wholesale level would be interested in building market share in gasoline retailing without regard to whether that share consists of company-operated or major-brand independent stations. To increase its sales, a refiner would want to develop the most efficient system for delivering gasoline from the terminal to the consumer's vehicle. If independents were the most efficient delivery system in some circumstances, the refiner would want to stick with that approach.

In fact, there is evidence that company-operated stations are more efficient in at least some locations. A 1983 study by Barron and Umbeck, published in the January/February 1983 issue of *Regulation*, showed that when Maryland prohibited integrated refiners from selling gasoline through company-operated stations, retail prices increased at the converted stations. That probably happened because independent operation was a less efficient form of distribution than company operation for those stations—either because company operation yields technical integration economies or because it eliminates double marginalization.

Finally, city-level market share numbers for terminal or retail sales are not good indicators of market power in the gasoline distribution industry for another reason. The degree of market power derived from a high market share of one firm or among a small group of firms depends largely on the speed and cost with which other firms could expand output. If a few firms sell most of the output in a market, this will imply significant market power only if a reduction in output by the dominant firms will not be quickly replaced by other

firms. In most local gasoline markets one firm can expand output quickly, because it can divert volume easily from other cities. For instance, if one refiner sold 75 percent of the gasoline in a given city and tried to exercise market power by restricting its supply, another firm with a terminal at the city—or able to rent the use of a third firm's terminal—could quickly expand its output and offset the effect of the dominant firm's supply restriction. Even if 75 percent of the service stations were affiliated with a single major brand that raised its prices, the remaining stations with lower prices would be able quickly to expand market share.

If integrated refiners did possess market power, it still would not be sufficient to make a predatory pricing strategy profitable. A firm that lowers prices in the hope of driving out rivals incurs losses that increase with the length and intensity of the predatory practice. The only gain from a predatory strategy is the possibility of reduced competition in the future. The characteristics of gasoline retailing make it extremely unlikely that such a strategy would be profitable. Entry into gasoline retailing is relatively easy. Initial capital requirements are moderate, and gasoline retailing does not require scarce skills or highly specialized technology.

Sales of gasoline by major-brand independent jobbers and dealers still represent more than 50 percent of all gasoline sold by the major refining companies. Those channels are likely to represent a significant proportion of major-brand gasoline distribution for the foreseeable future. If the major refiners were trying to eliminate independent major-brand dealers with a strategy of slow death by pricing slightly below cost for many years, it is unlikely that the refiners would ever be able to recoup enough profits in the future to make that strategy worthwhile. Attempting to eliminate that channel through predatory pricing would not just be illegal, it would be unprofitable.

Pricing Anomalies in Gasoline Markets

The large numbers of firms that compete at each level of the gasoline distribution industry, the relative ease of entry, and the ability to expand supply rapidly all contribute to highly competitive gasoline distribution markets. Still, the gasoline market does not adhere to the textbook model of perfect competition. Price discrimination occurs at the retail level; changes in crude oil and spot gasoline prices may not immediately translate into changes in wholesale and retail prices; and increases and decreases in upstream prices may not be passed along to downstream markets equally quickly. Those idiosyncrasies reflect departures from the perfect competition ideal, and they have attracted the scrutiny of government officials. But they are far from evidence of anticompetitive behavior.

Price discrimination at the pump is common. Throughout most of the 1980s retail margins on leaded gasoline were substantially lower than margins on unleaded gasoline. One common explanation is that buyers of leaded gasoline were poorer and were more willing to shop around for low prices, so competition for their business was more intense. Price discrimination also has been identified in the pricing of full-service gasoline sales at stations that offer both full- and self-service. Those pricing practices are consistent with a monopolistically competitive industry where location gives retailers a modest amount of pricing discretion, with the result that competitive discipline does not cause prices to exactly equal cost on all products. Nonetheless, it is clear that rivalry among retailers is sufficient to limit profits and, indeed, to induce substantial exit.

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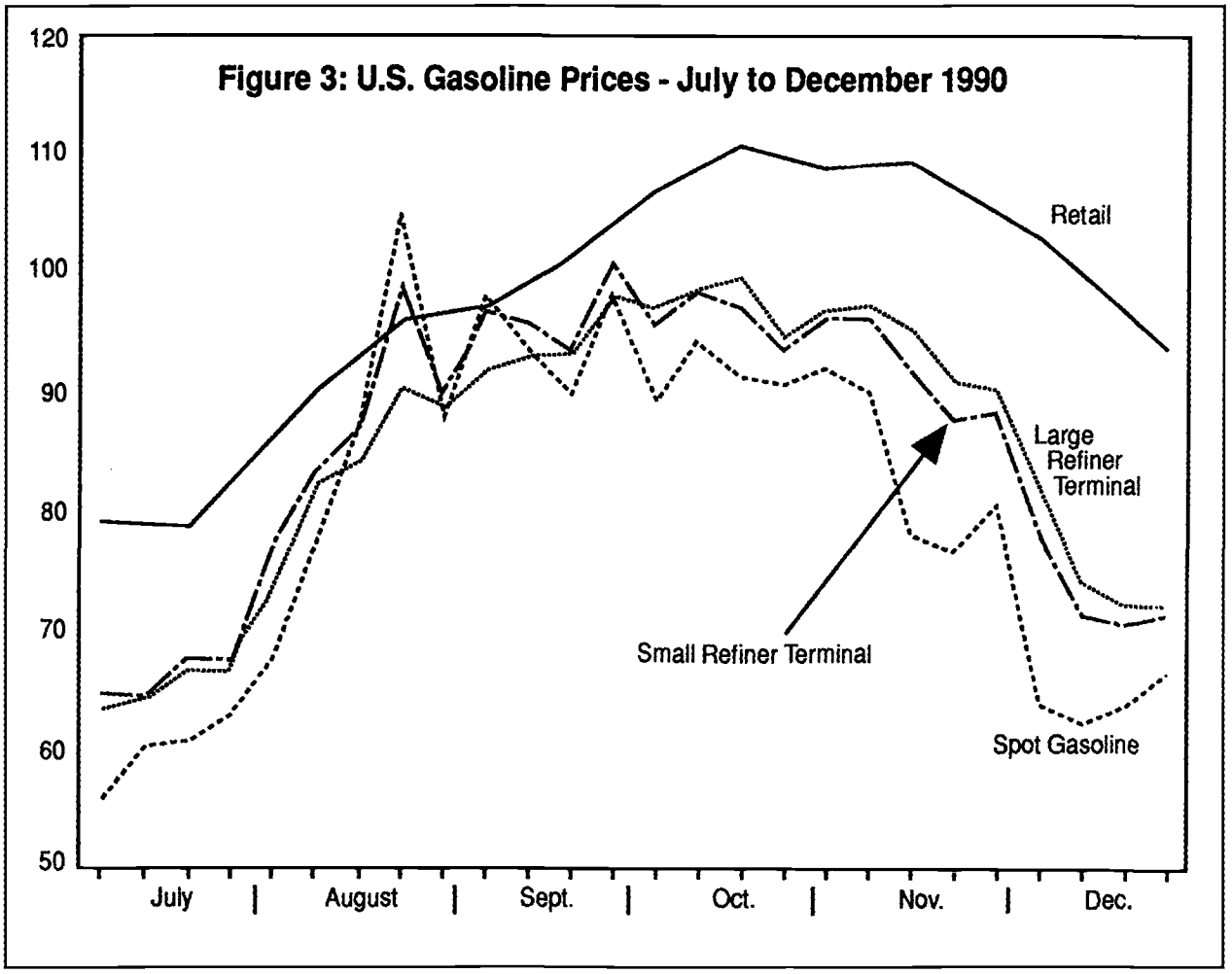
Departures from the perfectly competitive model also appear in the transmission of price changes from crude oil to wholesale and retail gasoline. The industry has been criticized for "rockets and feathers" pricing—retail gasoline prices go up quickly like rockets and down slowly like feathers. Increases in crude oil prices are fully passed along to the retail pump within four weeks on average, while decreases average closer to eight weeks. That pricing asymmetry, however, is not apparent in the terminal prices that major refiners charge. Prices at the terminal adjust both upwards and downwards in about two weeks. The difference occurs in the transmission of price changes from the terminal to the retail level, where increases pass through in two weeks on average, but decreases average five to six weeks.

The events connected with the Iraqi invasion of Kuwait in August 1990 provide a vivid demonstra-



tion of the pricing lags that occur in the industry. In Figure 3 we show U.S. average gasoline prices for the last half of 1990. In the three-week period starting six days before the Iraqi invasion (our price data are for Fridays, and the invasion began on a Thursday), the price of generic unleaded gasoline traded in the spot gasoline market increased by about 25 cents per gallon. Spot gasoline prices are usually, but not always, the lowest prices in the gasoline supply chain. The quick response is typical of spot gasoline prices. They reflect trades in a very competitive homogeneous good market that includes many buyers and sellers.

The response to the Iraqi invasion also appeared fairly quickly in terminal prices. During the three-week period, the average terminal price for gasoline from small refiners increased by about 20 cents per gallon, while major-brand terminal prices increased by an average of 17 cents. The average price rise at the pump over the period was smaller. Retail gasoline prices increased by an average of 12 cents per gallon, which was less than half of the increase in the spot price and about two-thirds of the wholesale price increase. Such a pattern of lags is typical in the industry: spot prices increase most quickly, terminal prices of small refiners nearly as quickly, terminal prices of major-brand refiners somewhat more slowly, and retail prices most slowly of all.

Many consumers and politicians blamed the increase in gasoline prices after the Iraqi invasion on "gouging," "profiteering," or some other non-competitive behavior. Many argued that the price of gasoline should reflect the price of the oil from which it is made. Since the oil refined to make today's gasoline was purchased or extracted weeks ago when prices were lower, they asserted that the gasoline prices should reflect the lower historical oil prices.

By now, the economic response to this fallacy is familiar. The value of gasoline inventories changes immediately when crude prices change,

because the marginal cost of supply determines the market price. Gasoline is produced from oil that has a market value equal to the crude oil price. As an analogy, houses sell for prices that reflect current market conditions, not necessarily the past cost of building the house. Selling a house for more than it cost to build or buy is not an exercise of market power.

The sharp increase in gasoline prices that followed the rise in crude oil prices during the Gulf War was an inevitable consequence of the high level of competition in the industry. The surprise is not that gasoline prices adjusted as quickly as they did, but rather that they did not adjust immediately.

The slower reaction of retail prices to the crude oil price increase had the effect of compressing downstream margins soon after the Iraqi invasion. For brief periods of time, unusual pricing relationships existed in some cities in which retail prices were below wholesale prices. Independent jobbers and retailers complained that those instances of negative retail margins, known as "price inversions," epitomized the anticompetitive behavior of the integrated refiners. The independents argue that inversions and persistent narrow margins are part of the integrated refiners' strategy to drive them out of the market.

Narrowed and negative margins between major-brand wholesale and retail prices coincided, however, with a more general reversal of the alignment of prices in the distribution chain. Spot gasoline was priced for a period above the average wholesale price of small refiners, which in turn was above the average wholesale price of the majors. Such a pattern is difficult to square with an attempt by the major refiners to drive independent jobbers and retailers out of business.

To more closely examine market forces at different levels of the gasoline supply chain, consider the last week of August 1990, a time of high tension in the Persian Gulf. On August 24, gasoline in spot transactions was trading at about $1.05 per gallon, up from 63 cents at the end of July. In that week the terminal price of gasoline from small refiners was about 6 cents per gallon below the price of spot gasoline, and major-brand gasoline at the terminal was selling for an average of 9 cents below the terminal price of small refiners. In normal times the spot price of gasoline averages 6 cents below the small-refiner gasoline prices at the terminal, which average less than a cent below the major-refiner prices at the terminal. In August 1990 the major refiners were slower than the smaller companies to increase their terminal prices in the wake of increases in crude oil and gasoline spot prices. That relationship could not last long, however.

Chevron's sales history during that period reveals why the majors could not keep prices down at the wholesale level. In September, when Chevron was continuing to hold its terminal price below the price being charged for generic supply, Chevron's sales at the terminal increased by more than 40 percent relative to one year earlier. The usual fluctuations in market demand cannot explain such a large increase. The obvious explanation is that jobbers who would normally buy from small refiners or on the spot market were substituting major-brand product at the terminal because it was cheaper. Although the major-brand product could not be sold as Chevron gasoline in other stations, or as the gasoline of another major brand, it could be used by jobbers to supply stations that are not affiliated with a major integrated oil company. It could also be brokered back to the spot market, where prices were higher. As a result, Chevron's branded supplies were being depleted, and Chevron was having a difficult time meeting its obligations to its own stations. The only recourse was to increase the terminal price to achieve at least parity with small refiners' prices. That was accomplished toward the end of September 1990. Spot prices fell below prices at the terminal, and all upstream prices remained in their normal relation through the end of the year. Terminal sales then returned to approximately seasonal levels.

Terminal prices must adjust quickly to upstream price movements, because many wholesale buyers have quite a bit of flexibility to switch to the lowest price in the wholesale or spot gasoline market.

The lesson here is that the majors have little

discretion to hold the line on price increases at the wholesale level. Terminal prices must adjust quickly to upstream price movements, because many wholesale buyers have quite a bit of flexibility to switch to the lowest price in the wholesale or spot gasoline market. The majors have more control over retail prices at their company-operated stations (and in delivered prices to their direct-supplied brand-name stations) for the same reason that all gasoline retailers have pricing discretion—there is locational and brand differentiation among gasoline retailers. Differentiation among retail sellers permits longer lags in adjustment to upstream price changes, because buyers in that market do not instantly switch to the lowest price in the market or deplete inventories by hoarding cheaper fuel.

Those pricing lags can result in brief periods of unusually low margins for gasoline retailers when upstream prices rise. Were the low or negative retail margins part of a conspiracy to eliminate competition from major-brand independent jobbers and retailers? That seems very unlikely.

During the Persian Gulf conflict, a buyer was probably more likely to infer a marketwide change in gasoline prices if his usual station raised its price, and he was thus less likely to shop around in response.

Although the pricing relationships during the chaotic period were unusual, they are not too surprising when viewed in light of the sudden jump in crude oil prices and the differential price adjustment lags in the gasoline distribution chain. Those lags, in turn, appear to be a combination of responses to political pressures, the desire of retailers to protect market share, and other competitive forces, some of which are imperfect, but not anticompetitive.

The argument of a predatory strategy is further weakened when we observe the entire second half of 1990. Following the increased tensions in September, prices began to fall in late October. Even before that decline, retail prices had caught up with earlier changes, and retail margins had returned to normal levels. The lag in retail price adjustment to oil price decreases in the last two months of 1990 created unusually large retail margins. Overall, the average difference between retail prices and major-brand terminal prices was slightly greater in the second half of 1990 than in the first half of the year and slightly greater than the average over the 1986 to 1990 period. Far from predatory, the gasoline pricing during the Persian Gulf conflict may have actually improved the margins many jobbers and retailers earned because of the asymmetric response of retail to wholesale prices.

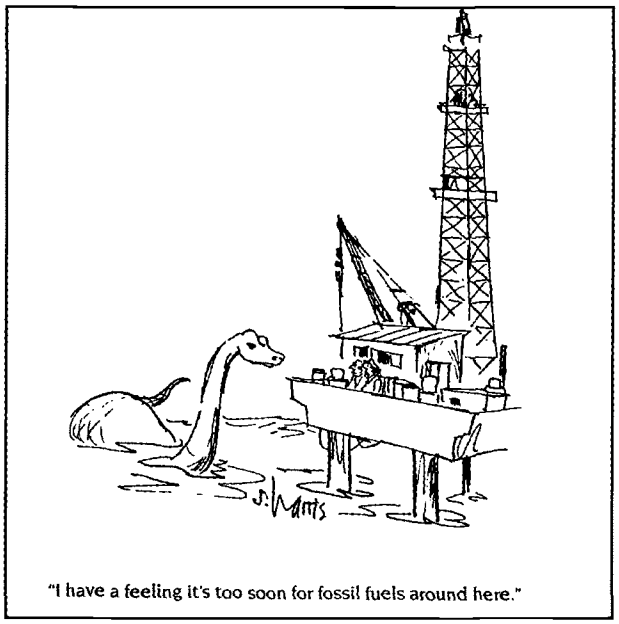
Still, this leaves the question of why retail prices increase more rapidly than they decrease in response to terminal price changes. One hypothesis is that during times of changing crude oil and gasoline prices, comparison shopping is more difficult and costly for gasoline buyers. If crude oil and gasoline prices have been very stable, then a buyer knows that an increase in retail gasoline price at one station is unlikely to be a marketwide phenomenon and will look around for a better price. If prices are volatile, on the other hand, then it is more difficult for a buyer to distinguish a local price change from a marketwide change. For instance, during the Persian Gulf conflict, a buyer was probably more likely to infer a marketwide change in gasoline prices if his usual station raised its price, and he was thus less likely to shop around in response.

If that is the case, then volatility in oil and gasoline prices will give short-run market power to individual retailers, which will speed up transmission of price increases. It would also tend to slow down transmission of price decreases, since the volatility associated with the change would push prices in the opposite direction of the change itself. The overall effect would be an asymmetric response of retail prices to terminal price changes.

An alternate theory of asymmetric retail price transmission also incorporates the notion of short-run pricing discretion. The retail gasoline industry is very competitive, so firms end up pricing close to cost over the long term. When terminal prices rise, dealers increase their retail prices quickly to maintain retail price above the wholesale price of product, but when input prices fall, each retailer attempts to maintain the previous price for as long as possible. What breaks up this resistance to price decreases, and does so relatively quickly, is the temptation of each retailer to cut price slightly to steal busi-

ness from competitors. No station wants to be caught with a price above market, so once a seller thinks its competitors are cutting price, it does the same, and the above-cost pricing unravels. It appears that if this is the explanation, then the unravelling takes a few weeks.

Both explanations imply that service stations are vigorously, but not perfectly, competitive. The asymmetry allows them to earn higher revenues than if it did not exist, but the revenues are clearly not leading to excess profits. Rather, with the ease of entry into the market and mass exit among independent major-brand retailers, the asymmetry is probably just lessening the losses that some retailers would otherwise earn until the time that enough outlets disappear and the remaining dealers can break even.



"I have a feeling it's too soon for fossil fuels around here."

Legislative Remedies: Curing a Healthy Patient?

Proponents of the retail margin bills recently introduced in Congress argue that legislation is needed to prevent low or negative retail margins and to counter anticompetitive pricing behavior by integrated refiners that is designed to eliminate independent jobbers and retailers. The main effects of the bills, however, would be to increase retail gasoline prices further during supply disruptions, to limit supplies of gasoline to major-brand independent jobbers, and to interfere with the trend toward high-volume stations. Furthermore, the bills would require a massive regulatory structure.

The proposed gasoline margin bills would regulate only those refining companies that sell gasoline both at wholesale and at retail. Companies that are either 100 percent integrated into refining and marketing (that do not sell gasoline at wholesale) or refiners that do not have any direct-operated stations would not be affected, while partially integrated refiners, a group that includes the 15 largest gasoline producers in the country, would bear large financial risks for failing to maintain sufficient gaps between the prices at their company-operated retail outlets and their upstream wholesale prices. As a result, the proposed legislation might cause the integrated refiners either to eliminate direct-operated stations or to become more integrated into direct-operated stations and to abandon or reduce supplies to major-brand jobbers and independent dealers.

The first strategy is known as retail divorcement and is probably the outcome for which major-brand jobbers and retailers are hoping. That would be unfortunate, however, because the integration of refining and marketing is an efficient corporate structure for selling gasoline in many circumstances and the evidence, as we have seen, is that divorcement would not lower retail prices in the long run. Moreover, there is no evidence that retail divorcement would eliminate price inversions or periods of low margins.

The prospect of retail divorcement by integrated refiners reveals a plausible reason why minor-brand jobbers and retailers also strongly support the proposed legislation. Retail divorcement would weaken the vertical supply efficiency of integrated refiners in areas where they find company-operated stations to be most efficient. In such cases divorcement would probably raise the price charged by a large part of the retail sector—always a welcome change for other firms in the market. Furthermore, the major-brand integrated refiners are not only primary competition for minor-brand jobbers and

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retailers but also a potential supply source. With fewer efficient major-brand marketing avenues available, large refiners might have more supply that could be bought in the spot market or at the terminal for use in minor-brand stations. It is no surprise that the Society of Independent Gasoline Marketers, which is comprised of minor-brand independent jobbers and retailers, is a strong proponent of the gasoline margin bills.

An alternative to retail divorcement by integrated refiners is eliminating or restricting wholesale volume to all jobbers and direct-supplied retailers. Eliminating wholesale market sales probably would not be practical in most regions where independent major-brand jobbers and retailers are a refiner's primary channel of gasoline distribution, but it could be in areas where a refiner distributes primarily through company-operated stations. Furthermore, in response to a margin-regulation bill, an integrated refiner *might* reasonably pursue a long-term strategy of phasing out its independently operated stations on an area-by-area basis and moving towards company operation.

If refiners do not divest their retail operations or eliminate service to independent jobbers, at least in the near term, they will change their pricing practices and sales policies to reduce the risk of legal penalties. Even if the legally mandated margin requirements were satisfied on average, integrated refiners would recognize the possibility that normal variations in market prices over time and geographical area, or simply errors in reporting prices, would trigger large damages and expose them to costly lawsuits. The fines prescribed in some of the bills are so large and the uncertainty about the outcome of a jury deliberating over the operating costs of direct-operated stations are so great that a refiner would go to great lengths to avoid breaking the margin trip wires. If we assume that the refiner continues to operate at both retail and wholesale levels in gasoline distribution, that means either lowering wholesale prices and rationing independent jobbers or raising retail prices or both.

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During unusual and sudden increases in crude oil prices, when margin requirements are most likely to be violated, the refiner's best response to the proposed laws would usually be to raise retail prices faster than it otherwise would. To the extent that the refiner responded by lowering wholesale prices or raising them less quickly, it would increase demand when supplies are already tight and would then be forced into imposing some sort of rationing. Rationing would be necessary to keep jobbers from depleting a refiner's inventory and would affect most or all independent jobbers and dealers. Rationing would allocate more supply than is efficient to some retail sellers and less than is efficient to others and thus would disrupt the entire distribution system.

Most of the proposed bills would allow an integrated refiner to defend itself against an alleged violation by showing that its actual marketing costs are less than the difference between its retail price and its upstream price charged to resellers. Such a defense would subject each station operated by a refiner to the equivalent of public utility regulation. The determination of costs would have all the complexity of a rate review in a public utility regulatory proceeding, a process that can consume more than a year of effort by a team of professional regulatory staff. The companies covered by the proposed legislation directly operated about 11,000 stations in 1990. A review of their marketing costs would be more complex in some respects than a public utility review because there is no uniform accounting standard in the retail gasoline industry. Requiring even a small fraction of the 11,000 stations to undergo a cost audit would be an extraordinary burden on both the affected companies and consumers, who ultimately have to bear the costs. Moreover, the uncertainties of a cost review are so great that integrated refiners would have little way of knowing when they are, or are not, in compliance with the law.

Some of the proposed bills would also eliminate the volume-discount incentive programs that many refiners use to encourage lower retail margins at franchised stations. That too is a misguided interference in the vertical supply relationship. An efficient distribution system delivers product to consumers at the lowest possible cost. Refiners and consumers have similar interests in maintaining an efficient retail network—the consumer is able to buy at the lowest price, and the refiner is able to sell more product. Retailers often have interests opposed to those of refiners and consumers. Large

retail margins increase retail profits but do not help the refiner move his product to market and do not benefit consumers. The proposed legislation would prohibit any scheme or agreement that is intended to limit maximum retail prices and thus would ensure that refiners may take no steps to keep retail prices down.

Conclusions

In some ways it is surprising that an industry as competitive as gasoline distribution and retailing has been the focus of so much government oversight and regulation. The large swings that occur periodically in input costs and output prices explain some of the attention. Consumers and voters have demonstrated repeatedly their distaste for big price changes. Although price stability surely has its virtues, the costs of imposing such stability artificially are hardly ever communicated to the public. Unclear about the regulatory causes of the gas lines in the 1970s, many in the public and Congress want to impose regulations that would disrupt gasoline distribution again.

Certainly, the attention to gasoline marketing can also be explained in part by the sheer size of the industry: over $100 billion in annual retail sales. In such a large market a small degree of imperfection in competition can lead to significant consumer losses. Unfortunately, it is often forgotten that a small degree of inefficient government interference in such a market also can lead to large losses. With so much money at stake, there might be many people looking out for consumer welfare, but there are certainly many people pursuing their own gains through government regulation. The margin bills currently under consideration in Congress seem to reflect the latter type of activity.

A careful review of the structure and operation of the gasoline marketing industry demonstrates that there is no problem that the government intervention currently proposed is likely to correct. The claim that integrated refiners are attempting to run the independent marketers out of business is unsupported. The pricing behavior, specifically the pricing inversions on which complaints have focused, is anomalous but does not appear to be motivated by anticompetitive goals. The structure of the industry and the economics of gasoline distribution make it virtually certain that the alleged anticompetitive behavior would end up hurting the major companies, not benefitting them. The regulations currently proposed would not enhance competition; rather, they would protect inefficient wholesalers and retailers from efficient changes in the gasoline distribution system.

Selected Readings

Barron, John, and Umbeck, John. "A Dubious Bill of Divorcement: The Case of Oil Refiners and Gas Stations." *Regulation*, Vol. 7, no. 1 (1983)

Borenstein, S. "Selling Costs and Switching Costs: Explaining Retail Gasoline Margins." *RAND Journal of Economics* (Autumn 1991).

Borenstein, S., Cameron, A. C., and Gilbert, R. "Do Gasoline Prices Respond Asymmetrically to Crude Oil Price Changes?" *National Bureau of Economic Research Working Paper #4138*, August 1992.

Shepard, A. "Contractual Form, Retail Price, and Asset Characteristics." *RAND Journal of Economics*. (Spring 1993).