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The Economics of Gasoline Retailing: Petroleum Distribution and Retailing Issues in the U. S.

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ABSTRACT

Gasoline retailing practices in the United States continue to be controversial. This controversy, largely over zone pricing and non-price vertical restraints, occurs in part because integrated refiners use a variety of distribution methods to move their gasoline to the consumer. These different methods can conflict with each other. The use of different retail provisions allows refiners to offer retail outlets across as many markets as possible. Such provisions have been the subjects of antitrust scrutiny, but have not resulted in successful litigation. The reason for the lack of success for antitrust plaintiffs is clear: these actions are not likely to harm consumers.

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INTRODUCTION

Industry practices in gasoline retailing in the United States continue to be controversial. In part, this controversy occurs because integrated refining companies use a variety of distribution methods to move their gasoline from the refiner to the consumer. These different methods can come into conflict with each other. The goal of this article is to examine why integrated refiners use different distribution methods, how those methods are manifested in retailing and pricing of petroleum products, and the important policy issues that surround those distribution and retailing choices.

Section II suggests that events in this sector are best examined from the view of the integrated refiner. Like consumers, the integrated refiner wants to lower the costs of distributing gasoline. The refiner also wants to manage its brands to provide benefits to consumers.

Section III reviews the three basic methods by which integrated refiners distribute gasoline: through company operated stations, franchised dealer stations, and jobbers. Section IV examines the rise of a new component of this distribution mechanism, hypermarkets. Section V discusses the impact of the Petroleum Marketing Practices Act.

The most controversial practices in gasoline retailing, price zones and non-price vertical restraints, such as territorial restrictions, are examined in Sections VI and VII. In large part, the practices of zone pricing and non-price vertical restraints are ways for companies to be competitive and better serve consumers in the marketplace while minimizing tensions between distribution channels. As long as different types of distribution systems exist, integrated refiners will act to optimize their distribution networks, and activities like zone pricing and non-price vertical restraints are part of that optimization. Section VIII reviews the economic incentives that may cause the opposition to non-price vertical restraints.

The best way to evaluate the performance of the retail gasoline distribution system is to look at what retailing costs consumers. Section IX examines retail margins, and the measure of the costs of retailing to consumers. Since 1983, retail margins have fallen significantly. Section X contains some concluding thoughts.

1. THE INTEGRATED REFINER'S PROBLEM

1.1 The Refiner's Point of View

The best way to examine the organization of the retail distribution of gasoline is from the integrated refiner's point of view, as it is the refiner

who makes the relevant organizational choice. An integrated refiner both owns a refinery, and has a branded presence in the retail gasoline market. Firms such as ExxonMobil, Shell, Marathon Ashland, BP, Sun Oil (Sunoco) and ChevronTexaco are integrated refiners. Of course, there are refiners without a retail presence, as well as independent gasoline stations and chains that do not own refineries. In 2002, integrated refiners accounted for about 78 percent of all refineries in the United States, down slightly from 79.3 percent in 1992.[1]

A refinery is an expensive investment and is complex to operate. In addition, it is very difficult to enter into the refining business. The last new refineries in the United States went onstream in the late-1970's. Indeed, many observers state that it is somewhere between extremely difficult and impossible to build a new refinery in the United States.[2]

From an economic point of view, a refinery also represents in large part a "sunk" or "asset specific" investment. (See Klein, Crawford, and Alchian, 1978.) In economic terms, sunk investments are considered risky, since they do not have valuable alternative uses. Thus, refinery investments cannot be switched into another sector should the refinery prove non-remunerative. Thus, refiners need to take actions to protect their sunk investments. In addition, the pipelines that connect the refinery to terminals also represent asset-specific investments.

Over time in the U.S., there has been a dramatic decrease in the number of refineries. However, the amount of capacity at U.S. refineries has grown, as the remaining refineries have expanded their capacities. Since 1947, the U.S. number of refineries has declined from 399 to 149. At the same time, average refinery capacity has grown significantly, resulting in a tripling of total refining capacity from 5 million to over 16 million barrels per day. (See Figure 1.)

There has also been a substantial decrease in the number of retail gasoline outlets. The number of gasoline outlets in the U.S. has declined from over 203,000 in 1994 to about 168,000 in 2003. (National Petroleum News, various issues). This decline in the number of stations may have been the result of a number of factors, including the cost of compliance with environmental regulations, population dynamics, and changes in the nature of ancillary business, such as automotive repair work. The decline in stations has been accompanied by an increase in total gasoline volume,

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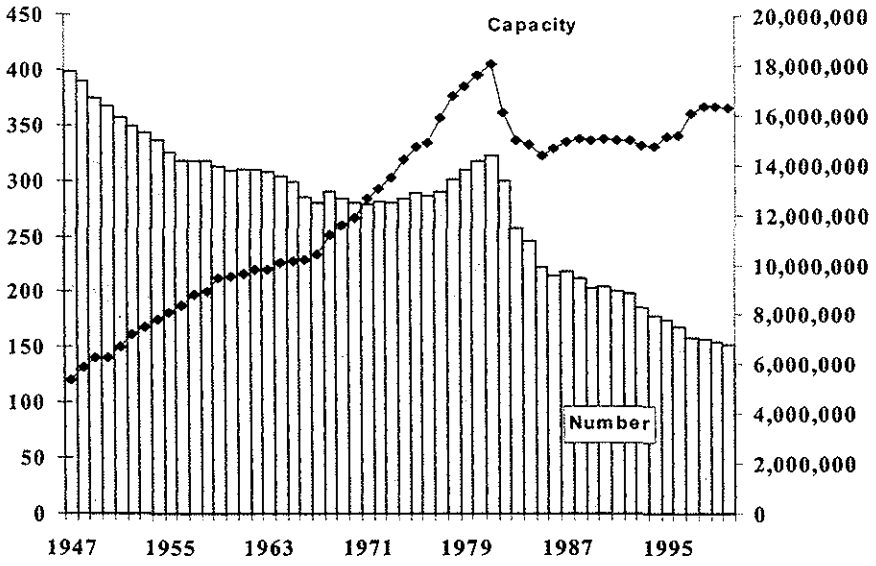
[1] Data derived from National Petroleum News Factbooks and U.S. Energy Information Administration, Petroleum Supply Annuals.

[2] See, for example, Poteen and Partners, "Gasoline Prices Surge, http://www.poten.com/?URL=show_articles.asp?id=318&table=tMarket, September 5, 2003, and Statement of Ronald W. Williams, President, Gary-Williams Energy Corp., before the U.S. Senate Committee on Finance, http://www.senate.gov/~finance/071101rwtest.pdf, July 11, 2001.

implying that individual stations now have higher average volumes. Thus, it would appear the factors discussed above have increased the relevant economies of scale in gasoline retailing. (See also the discussion in FTC, 2004 at 227-228.)

Figure 1
U.S. Refineries, 1947-2002



Source: API, Basic Petroleum Data Book

The gasoline retailing sector is largely different than the refining sector with respect to asset-specific investments.[3] Gasoline retailing requires investments in land and storefronts. Such assets are relatively easy to obtain (at least compared to the assets for refineries), and relatively easy to move to alternative uses. The chief difficulty in opening a station appears to be the need to acquire storage tanks and the relevant environmental permitting. In addition, closing a station may involve environmental cleanup costs. However, as Keeley and Elzinga (2003 at 160) note, there has been a great deal of entry and exit in the retailing sector.

[3] Previous literature in this area includes works by Barron and Umbeck (1984), Marvel (1995), and Slade (1996).

It is thus the refining sector where investment is most at risk. The refining of oil is of little value if there is not an efficient method to market the product. Thus, a refiner desires to get its product to market – from the refinery, through a pipeline or other method of transportation, to a terminal, or "rack," via truck to a station, and then sold to a customer. Conceptually, a refiner could simply rely on the spot market, and long-term contracts with independent retailers, to sell its gasoline. The basic rationale of vertical integration (see, for example, Carlton and Perloff, 2000, 380-385), however, is to avoid contractual difficulties and to create a more certain market for its asset-specific product. The various forms of vertical integration discussed in this paper can be seen as an attempt to solve this problem. A refiner also desires a more certain market for its product than would be available simply by using gasoline "spot markets."

It is very important to understand that the refiner has clear incentives to improve product distribution and that such incentives work to the benefit of the consumer.[4] The demand for gasoline from refineries is a "derived demand," derived from subtracting the cost of retailing (distribution) from the retail demand for gasoline. Thus, the lower the costs of distribution of selling gasoline, the greater the derived demand for gasoline, the greater the refiners' profits (as well as the lower the final price to consumers). In effect, if distributor marginal costs are constant,[5] a reduction in downstream costs has the same effect on a refiner's profits as a reduction in its own costs.

1.2 Managing the Brand

In addition to seeking out the lowest cost methods of distribution, the refiner often has an important name brand reputation to both employ and protect. The utility of branding is often unclear to casual observers. Economists, however, have conducted important work in this area showing how branding serves to protect product quality for consumers. (See, for example, Klein and Leffler, 1981, and Shapiro, 1983.)

The value of a brand is represented by the amount consumers are willing to pay producers for an implicit promise of value. The promise of value deals with goods whose quality is not obvious upon inspection. The branding of a product also implies product consistency – that the product will have the same quality every time the consumer purchases it.

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[4] Conceptually, a refiner could also have incentives to exploit the vertical relationship with its dealers for anticompetitive reasons. This, however, as the discussion below indicates, appears unlikely in this industry.

[5] If distributor marginal costs are not constant, similar but more complex results apply.

The basic theory of establishing a brand reputation is clear. The first input into establishing a brand is selling quality products and services for a substantial period of time, building up a positive expectation in the minds of consumers about quality. That expectation is reinforced by a significant amount of advertising, which serves to signal that the high quality products will continue to be supplied. In the case of integrated refiners, their brands are the result of decades of operation, backed by large national advertising campaigns.

Once a refiner has established a brand name reputation, it must take active measures to manage that reputation. In the gasoline sector, the refiner depends in large part on independent dealers to present its brand image to the consuming public. (See, for example, Lafontaine and Shaw, 1999, and Bai and Tao, 2000.) Each individual dealer has incentives to "shirk" on product attributes, and therefore reduce the value of the refiner's brand. To deter such activity, the integrated refiner must take active steps to stop its franchisees from "free-riding" on its reputation.

For example, when a potential consumer is driving down the road looking for a gasoline station, she may see a distinctive sign with a particular refiner's brand name on it. The quality that brand signals will help the consumer decide whether or not to go to that station. But that brand quality is shared among the brand's outlets. In such circumstances, it could be profitable for the owner of a particular outlet to "shirk" on product quality – not offer the product quality implied by its brand name. This behavior may increase the outlet's profits by reducing its costs. However, this action harms the brand name value of the entire chain, resulting in reduced profits for other outlets, as well as the integrated refiner. Klein (1995 at 12-13) describes the problem this way:

> In general, when franchisees use a common brand name, each franchisee can reduce its costs by reducing the quality of the product it supplies without bearing the full consequences of doing so. Because a reduction in quality has the effect of reducing the demand facing all franchisees using the common name, not just the future demand facing the individual franchisee who has reduced quality, the incentive for individual franchisees to supply the desired level of quality is reduced.

It is this type of shirking that brand management; i.e., efforts by the integrated refiner to increase and/or maintain its branded premium, seeks to deter.

In the retail gasoline sector, there are two important components to brand quality. The first is the quality of the brand's gasoline. Today, most U.S. refineries produce "base gasoline" that meets Federal standards. At

the "rack," firms add in their own package of additives. Each firm's package has different attributes, and the quality of these packages is one measure upon which retail gasoline stations compete. The perception of gasoline quality varies from firm to firm. For example, one integrated refiner makes the quality of its branded gasoline a centerpiece of its marketing campaign, and claims that its gasoline is significantly superior to other brands of gasoline. Other firms assert that while quality of gas is important, the difference in quality between their own gas and the perceived higher quality brands is quite small.

This component of brand quality, the attributes of the gasoline sold, is relatively straightforward to protect. Outlets are required to sell only gasoline from a specific brand. Outlets are monitored closely for the quantities of gasoline they order from the refinery. In addition, the refiners hire testing services to determine if the gasoline at an outlet's pump is actually that brand's gasoline. Failure to sell only the specified brand of gasoline is cause for franchise termination.

Another candidate for branding is the quality of other goods and services at gasoline outlets. The quality of these services is by no means apparent when a consumer chooses a particular station. A station's brand logo signals to the consumer the quality of these goods and services. While the possibility of repeat purchases may be valuable for many operators, it may not be sufficient to create the quality refiners desire. Perhaps especially important in this category is the cleanliness of station facilities. Other items of concern involve station hours, quality of other products sold at the station, and whether or not the retail fuel price is above competitive levels. Firms actively monitor their stations, and give station operators precise guidelines on how they should operate their stations. (See, for example, ExxonMobil, undated.)

2. TYPES OF BRANDED RETAIL OUTLETS

Integrated refiners have three different basic types of outlet options and may employ any or all of their marketing strategies to maximize efficiencies and compete in the marketplace.[6] First, they can own and operate the retail outlets themselves (company owned and operated outlets). The second option is to franchise the outlet to an independent dealer and directly supply it with gasoline. This option may have three different forms of property ownership. This operator can lease from the refiner, lease from a third party, or own the outlet outright. The third

[6] This type of mixed distribution system is common across many industries. See, for example, Dutta *et al.*, (1995).

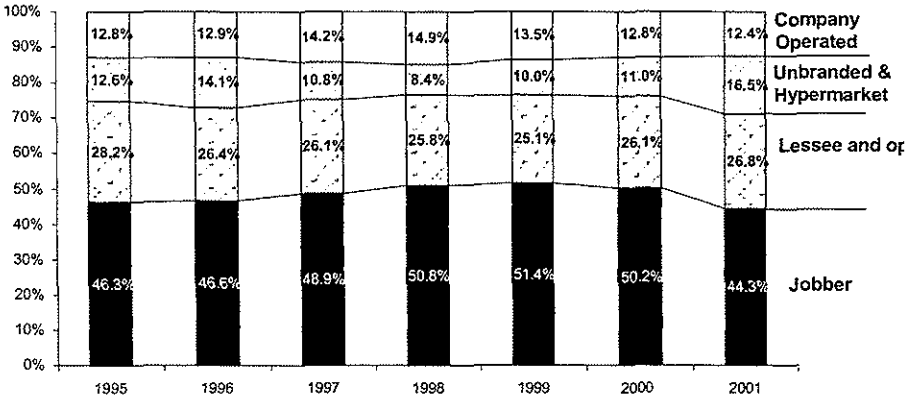
option is to utilize a "jobber," who gains the right to franchise the brand in a particular area. Jobbers may choose to operate some of their outlets with their own employees and franchise other outlets to dealers. In addition, some integrated refiners supply some of the gasoline sold through hypermarkets. The mix of distribution methods varies widely across firms.

Figure 2 gives the breakdown of sales by type of outlet since 1995. In 2001, jobbers constituted the largest fraction, with about 44 percent of sales. Lessee and open dealers contribute a little over 27 percent of the market, while company-owned operations constitute about 12 percent of the market. The remaining sites are independently operated and unbranded, and include the new retailing concept of hypermarkets. In this section I will review the advantages and disadvantages of each type of outlet from the refiner's point of view.

Figure 2

Motor Gasoline Sales by Outlet Type

(Source: EIA Form 782-A)



2.1 Company Operated Outlets

Most integrated refiners directly own and operate, with their own employees, some (often, between 10 and 20 percent) of their own gasoline outlets. In these locations, company employees generally manage the outlet, taking retailing and pricing direction from the refiner.

The basic advantage of a company-operated outlet is that the company can manage the entire customer offering. The refiner, for instance, can select the outlet's level of service offerings and gasoline price to best match its perception of market demand. It can make sure that only its gasoline is sold at the outlet. It can also ensure that the outlet takes part in the company's promotional activities. For example, if a refiner wishes to have a company-wide campaign of discounted soft drinks at its outlets, it is much easier to implement that campaign at company-owned operations than at independent dealer and jobber outlets. Further, a company-operated station also allows the refiner to engage in controlled product or service experimentation.

Perhaps the greatest advantage of company and contract manager operations is that neither operating form is subject to the Petroleum Marketing Practices Act (PMPA). The PMPA, among other things places important limits on how integrated refiners can react to changing market conditions in their jobber and independent dealer segments. With company and contract manager operations there are no such restraints. Firms can change their pricing, services and outlets quickly in response to competitive demands. (See the discussion of the PMPA in Section V below.)

2.2 Franchised Dealer Outlets

A second form of gasoline outlet is referred to as a franchise dealer. In such operations the dealer either owns a site outright, or, perhaps more commonly, leases it from the refiner. The franchised dealer agrees to buy its gasoline entirely (or almost entirely) from the refiner, and the refiner arranges for the gasoline to be delivered to the outlet. If the refiner develops a new outlet, it has often invested two million dollars or more in the site. If the dealer owns the outlet, the refiner may also have invested in the site, either by paying for improvements in the outlet, or loaning money to the dealer, often at favorable terms. In addition, some refiners may also be responsible for securing the site and arranging for promotion of the brand name in the relevant area, as well as for delivering the product to the station. (See, for examples, discussions in Meyer and Fischer, 2004, and Rockne 2001.)

Finally, if refiners own or lease the station property, they also take the responsibility for environmental liability and major equipment and building maintenance for the site, which is generally a significant obligation. The cost of these activities by the refiner is reflected, at least to some degree, in the wholesale price of gasoline charged to the franchised dealer.[7]

Franchise dealers receive gasoline from the refiner at what is called the "dealer-tankwagon", or DTW price. The DTW price includes the cost of transportation from the pipeline terminal (the "rack") to the dealer, which is arranged by the refiner. Franchise dealers then set the retail price of their gasoline.

The chief advantage of a franchised dealer outlet to the integrated refiner is that the operator has incentives to engage in entrepreneurship. The disadvantages of this method include that the refiner gives up a degree of control of the outlet's ability to meet consumer needs, either in the form of the quality of the services offered or the competitiveness of the retail price displayed at the pump.

Refiners who use franchised dealer operations strive to increase the quantity of gasoline sold at franchised dealer outlets. They have two important reasons for doing so. First, inducing gasoline sales generates a more certain market for their refined product. Second, refiners do not want direct service outlets to price uncompetitively, as it has the potential to create a double marginalization problem (as discussed below).

Indeed, refiners may have several other methods they can use to induce dealers to lower prices to consumers. Senator Carl Levin of Michigan, elaborating on a 2002 U.S. Senate staff report, described one alleged incident:

> ..the Majority Staff was told by several dealers that if they don't charge their retail customers the recommended price, the next delivery of gas from the oil company will reflect any increase instituted by the dealer. These dealers are saying that if they decide to price their gas at 1.40/gallon when the oil company recommend $1.35, the next delivery of gasoline to the station ..will have a 5 cent/gallon increase in the price to the retailer.[8]

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[7] Conceptually, the cost of these activities could be put into the lease charged to dealers. Keeley and Elzinga (2003), however, suggest this may not be feasible due to dealer liquidity constraints.

[8] Statement of Senator Carl Levin, Hearings on "Gas Prices: How Are They Really Set?," Permanent Subcommittee of Investigations of the Committee on Governmental Affairs, U.S. Senate, April 30, 2002 at 9.

Whether true or false, these allegations present an interesting example of how a refiner could act in the consumer's interest by encouraging lower retail prices from station operators, even when those operators seek to maximize their margins and profit by charging higher prices. Clearly, the refiner's interest is in getting a lower price to consumers "on the street," all other things being equal.

As the discussion above indicates, refiners have incentives to effectively limit the maximum price its retailers charge. Such explicit price limits, known as "maximum resale price maintenance," ("maximum RPM") are well known in the antitrust community. Assume a particular retailer does not face strong competition. In such a circumstance, both the refiner and the retailer individually have incentives to raise price above competitive levels. The final price to consumers is one that is both above the level that would occur were the refiner and the retailer to act together, and produces less profit in total for the two firms. As Areeda and Hovemkamp (2004 at Section 1634) explain, "Such a limitation is typically used to prevent a dealer with a degree of monopoly power in a local market from raising price above competitive levels and thereby "exploiting" consumers and reducing the manufacturer's sales."

Maximum RPM was per se illegal until the Supreme Court's recent decision in *State Oil v. Khan* 522 U.S. 3 (1997). Removal of the federal prohibition, however, does not imply protection to refiners from state legal authorities, who may bring action against refiners based on state, rather than federal, law.[9]

To try to solve such problems some refiners will place volume requirements on their dealers, or use other contractual mechanisms discussed above to encourage lower prices. Minimum volume clauses in a franchised dealer's contract require the dealer to sell a certain quality of gasoline per unit of time, or face financial penalties or loss of franchise. However, the refiner may waive these provisions in periods where market demand has decreased for other reasons.

Volume related contractual provisions differ from company to company. An example of a portion of a "synthesized" contract is presented here. A refiner may agree to supply an outlet with 100,000 gallons of gasoline per month at the "standard" dealer tankwagon price. Further, in areas where competitive market conditions dictate, the refiner may provide the retailer with an incentive to sell more gasoline through rebates designed to reduce the franchised dealer's cost of product. For example, if the outlet purchased between 100,000 and 125,000 gallons, the refiner will

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[9] See, for example, *Shell v. Commonwealth of Puerto Rico*, Civil Action Number 1144, May 13, 2004 (Federal District Court of Puerto Rico). The author served as a consultant to Shell in this matter.

reduce the price by 2 cents below standard price. For all gasoline sales above 125,000 gallons per month, the refiner will reduce the price by 4 cents below standard price. In this manner, the franchised dealer is encouraged to sell more gasoline.

2.3 Jobber Operated or Jobber Franchised Outlets

A third type of retail outlet is referred to as a "jobber" or a "distributor." A jobber is an independent operator who owns and operates a number of retail outlets, or sometimes has its own franchisees operating a portion of those outlets. The jobber enters into an agreement with the refiner to sell that refiner's gasoline, at a price determined by either the jobber or the jobber's franchisees, and display that refiner's brand at particular stations.

The jobber is responsible for siting, building facilities and creating local promotion. Often the jobber has knowledge of local conditions and thus is better able to perform these tasks. The jobber also has incentives for entrepreneurship, which may result in more efficient stations than would occur through company operations.

The refiner expects jobbers to develop markets for the refiner's brand. Developing markets includes learning about the relevant area, investigating potential outlet sites, and finding outlet operators who can succeed in the relevant area. Especially in rural areas, these are tasks that a jobber may find easier to perform than a refiner's employees.

The major disadvantage of the jobber form of retailing is that it is difficult for the refiner to monitor the jobber's marketing tactics, thus leading to the potential for "free riding" on the refiner's brand name. For example, jobbers often have contractual agreements with more than one branded refiner. Such jobbers could switch the brand of a portion of their chain with relative ease. A jobber can also abandon a territory, leaving a branded refiner without distribution in an area. This problem may be especially acute in or near a congested urban area, where escalating real estate prices may give a jobber the chance to profit by selling its real estate properties to a non-gasoline related firm. In such circumstances, it may be difficult for a refiner to gain contractual protection against such behavior.

Jobbers pick up their gasoline at the refiner's terminal, or "rack." Thus, jobbers are said to receive "rack" pricing. Because of the additional services the jobber performs, including arranging the delivery of product to its own stations and taking environmental liability, a jobber typically receives gasoline at a lower (wholesale) price than the DTW price franchised dealers pay. Jobbers may also receive lower wholesale prices because direct service operators have priority during times of scarcity. Jobbers, perhaps being more financially liquid than franchisees, may be

better able to withstand price shocks, and therefore able to deal with higher prices during scarce times. (See Marvel, 2003.) Jobbers may also face lower prices than direct service operators if direct service operators are charged less than market value for leasing their properties. (See the discussion in Keeley and Elzinga, 2003 at 161.)

There have been several lawsuits filed by franchisee operators asserting that they too should receive the "rack" price, rather than the DTW price. (See Keeley and Elzinga, 2003 at footnote 2). As the discussion above makes clear, however, franchisee dealers and jobbers perform two different sets of economic functions, and there is no reason why they should pay the same price to the refiner for gasoline.

The difference in wholesale prices between jobbers and direct service dealers also creates the potential for the jobber to resell the gasoline to the refiner's franchised dealers profitably. Both jobbers and franchised dealers could gain from this "arbitrage" opportunity, at least in the short run. If refiners allowed this activity to occur, however, it could eliminate much of the compensation they receive for developing and promoting franchised dealer operations. To prevent this type of economic arbitrage, refiners use non-price vertical restraints, as discussed below.

3. THE RISE OF HYPERMARKETS

Hypermarkets and "super convenience stores" are non-traditional retail outlets that, along with numerous other goods, sell high volumes of gasoline at prices near the wholesale price of gasoline. In general, the retailing strategy for hypermarkets is to attract customers to their stores through a low price of gasoline and a large number of gasoline pumps, and then induce those customers to come inside their stores and buy other products. Firms in this category across the country include Wa-Wa and Sheetz (super-convenience stores) in the Northeast, Costco and Albertson's in the West, and Wal-Mart (the last three all hypermarkets) in various locations across the country.

The rise of hypermarkets appears to have begun in the mid-1990s. At that time, federal regulations required refiners to change the environmental specifications of their "base" gasoline to a relatively uniform standard. This made the "base" gasoline sold by unbranded firms more competitive, and such firms were better able to provide product comparable to that sold in branded outlets. This, in turn, increased the ability of unbranded retail outlets to sell gasoline to consumers. (It should be noted, however, that integrated refiners still engage in important competition in gasoline product quality.)

Hypermarkets obtain at least some of their gasoline product from integrated refiners who also have their own distribution networks. This is

not surprising. Hypermarkets often serve to enhance refiner interests. In the short run, hypermarkets can serve as remunerative outlets for gasoline a refiner cannot use in its distribution channels. In the longer term, refiners may choose to sell gasoline to hypermarkets on a continuous basis, if refiners believe this is more profitable than maintaining or adding to its distribution chain. In addition, in the long run, it is a goal of refiners to increase the demand and price for their wholesale product. Hypermarketers, as extremely competitive marketers drive down (gross) retail margins, increasing the demand for gasoline and, therefore, increasing refiners' profits.

4. THE PETROLEUM MARKETING PRACTICES ACT

Legal relationships in the U.S. between franchisors (here refiners and jobbers) and franchisees in the petroleum industry (here, independent operators who run gasoline stations) are governed by the Petroleum Marketing Practices Act (PMPA).[10] Passed by Congress in 1978, the PMPA is designed to prevent what legal commentators have referred to as franchisors' "superior bargaining power" or "coercive power" in their relationship with franchisees.[11] In economic terms, what the act attempts to restrict is generally referred to as "post-contractual opportunism." (See Klein, Crawford, and Alchian, 1978.)

For example, franchisors, through their (perhaps) superior access to legal services, may be able to take advantages of any "gaps" in their contracts with franchisees. Conceptually, a franchisor could promise to extend a franchise if the franchisee invests in its property, only to renege on that promise. The PMPA acts to fill in many of these "gaps" in the contracting process, reducing the uncertainty in legal decisions, and reducing the cost of court access for many parties.[12] Each of these effects has positive economic consequences.

The basic provisions of the PMPA forbid a franchisor from terminating a franchisee unless certain specified provisions of the basic franchisee contract are violated. Such actions as criminal misconduct, bankruptcy, or failure to operate the property for seven days are cause for termination. Franchisees can also be terminated if the franchisor leaves the relevant geographic area, given that franchisees receive 180 days notice.

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[10] For discussions of the PMPA, see Rockne (2001) and Petroleum Marketing Law Institute, undated.

[11] See, for example, *Simmons v. Mobil Oil*, 29 F.3d 505 (1994).

[12] I note that "gap filling" is a traditional role of courts in common law countries, such as the United States. The legal process of gap filling, however, can take a great deal of time. One might infer that Congress was unwilling to wait for the process to occur, and acted on its own.

The PMPA also restricts the ability of the franchisor to fail to renew the contract of the franchisee. The limited, specified reasons for non-renewal include a large number of customer complaints, failure to keep a clean premise, and failure to agree in "good faith" on alterations to the relevant property. The PMPA also requires that rental increases be made in good faith.

The impact of these provisions is that, in many instances, a franchisee who acts in good faith, or at least not obviously in bad faith, has the equivalent of a perpetual franchise contract. This has two important negative consequences. First, it restricts the ability of franchisors to react to new market conditions. In the current context, franchisors may desire larger franchise sites to compete with hypermarketers. If, however, the relevant franchisee is unwilling or unable to make such investment commitments, it restricts the competitive abilities of the franchisor. Second, the PMPA creates a bias in refiner decisions toward company owned and operated stations and away from franchisees. Whatever the drawbacks of a company owned operation, refiners know that such operations can be modified to meet competitive conditions at the refiners' direction. Thus, the PMPA results in too many retail outlets being operated by refiners, and too few being operated by franchisees, from the point of view of both the refiner and society.

5. ISSUES SURROUNDING ZONE PRICING

The Federal Trade Commission (FTC) has described zone pricing as "the practice whereby refiners set uniform wholesale prices and supply branded gasoline directly to their company-operated and franchised dealer stations within a small but distinct geographic area called a 'price zone'."[13] Thus, nearby retailers of the same refiner who operate in different price zones may pay different prices for the same grade of gasoline that comes from the same "rack," and is shipped to them via truck. Zone pricing is a reflection of the refiner's recognition that there are different competitive conditions in different geographic areas.[14] For example, stations in areas with gasoline hypermarkets need lower wholesale prices in order to remain competitive. Differences in wholesale prices among price zones in a particular region can reach up to several cents per gallon, though most price differences appear to be much smaller (Maryland Task Force, 2001, at 5). Various legislative proposals have been put forward by franchised

[13] See http://www.ftc.gov/opa/2001/05/westerngas.htm.

[14] There is a good deal of economic literature on this point. See, for example, Shepard (1993) and Borenstein and Shepard (1996).

dealers, jobbers and their organizations to require refiners to offer the same prices on product to all customers in a geographic area.

Each refiner determines the nature of its price zones, and the price to be charged in that zone, based on a variety of competitive factors. These include the competitive conditions in a station's trading area, as well as the physical nature of the zone based on natural and artificial impediments to consumers' purchases. Such impediments can include a river or a set of hills, congested bridges and highways, and flows of traffic between employment and residential areas.

Firms look at competitors' prices in the area when setting up their own zones. The size and configuration, and price level in a zone may, in large part, be a function of whether or not there is a hypermarketer in the area. Low price zones are thought of by refiners as "help to the dealer" – they keep the franchised dealer in business while meeting competition in low price areas.[15] Thus, eliminating price zones could result in some retailers being unable to compete and could result in failure of some sites and thus affect the overall level of competition in this sector.

One industry executive has explained zone pricing in a more intuitive fashion:[16]

> It's the dynamics of meeting competition, and that's our basic philosophy. Zone pricing is just that. It is figuring out what's the relevant area of competition, and who do you want to compete against and why and figuring out where to set your price relative to those, so that you can get the volume that you need and the balance between volume and price and margin is what generates the cash to run the business. And it sounds mysterious, and it sounds complicated, but it is actually as simple as meeting local competition.

In recent years refiners have been using sophisticated decision support systems to help define and set prices in price zones. These systems estimate a station's gasoline volume as a function of the factors discussed above, and changes in the station's retail price. Given this, the systems will estimate which wholesale price will maximize the refiner's profits, while allowing the franchised dealer to remain competitive. (See Maryland Task Force, 2001, at 6.)

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[15] See the discussion along these lines in Majority Staff of the Permanent Subcommittee on Investigations, U.S. Senate, "Gas Prices: How Are They Really Set?," (2002 at 302).

[16] David C. Reeves, President, North American Products, Chevron Texaco Corporation, Hearings on "Gas Prices: How Are They Really Set?," Permanent Subcommittee of Investigations of the Committee on Governmental Affairs, U.S. Senate April 30, 2002 at 21.

The precise nature of price zones differs from company to company, as well as from region to region. One refiner has a price "zone" for almost every station. Another has over half of its price zones consisting of only one station. Other companies will generally have several stations in their price zones.

The existence of different price zones has been used by some franchised dealers and their trade associations in their attempt to show the existence of economic price discrimination. Price discrimination may be defined as offering a product that costs the same at at least two different prices to competing customers.[17] In certain circumstances price discrimination is illegal under the Robinson-Patman Act. The legal rules of this law are extremely complicated, to say the least, and will not be discussed at length here.[18]

Eliminating zone pricing, as sought by some franchised dealers and their associations, would have two negative consequences for consumers and refiners alike. First, requiring equal wholesale prices would raise prices to some dealers of a particular supplier, and reduce them to others. Recent economic research (see, for example Shaffer and Zhang, 1995), however, indicates that prices are more likely to rise on average than to fall. The reason is that eliminating zone pricing would change the focus of competition from many retail outlets to only a few terminal locations. The resulting "softening" of competition will likely generate, on net, higher prices for consumers.

Consistent with this, Comanor and Riddle (2003) found that requiring uniform wholesale pricing in California would, on net, increase average prices to consumers by reducing the level of competition between stations. This study indicates that, had zone pricing been eliminated in California in 1997 and 1998, retail gasoline prices would have been between 1.8 and 4.6 cents per gallon higher on average. This would have cost California motorists between $419 million and $625 million dollars per year in higher gasoline prices, depending upon the time period studied and interpretation chosen of the proposed statute. (See also the discussion of the Comanor and Riddle results in Keeley and Elzinga, 2003.)

Similar results are found in a recent working paper by Deck and Wilson (2003). Deck and Wilson "simulate" gasoline markets through the use of experimental economics. Deck and Wilson find that, in the laboratory, the elimination of zone pricing raises prices in more competitive markets by approximately 11 percent. The elimination of zone

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[17] It should be noted that economic definitions of price discrimination can vary.

[18] For an economic discussion of the Robinson-Patman Act, see Viscusi, Vernon, and Harrington (1992, 278-286). The Robinson-Patman Act is routinely criticized by scholars for many of the reasons presented here.

pricing has no effect on prices in less competitive markets. The results of this paper also imply that the elimination of zone pricing also serves to redistribute profits away from refiners toward the owners of stations in less competitive markets.

Two other economists speaking before a U.S. Senate subcommittee in 2002 made similar arguments. According to Professor Justine Hastings, then of Dartmouth University:[19]

> If refiners are forced to charge one wholesale price, it actually would be the case that average wholesale prices would rise. In addition, they certainly would rise in low-income neighborhoods, currently the most price sensitive neighborhoods. Zone price elimination could be a very regressive policy.

Professor R. Preston McAfee, then of the University of Texas made a similar statement:[20]

> Elimination of zone pricing by statute will not tend to reduce average gasoline prices. Instead, as Dr. Hastings emphasized, it will tend to increase prices in the most competitive and also the poorest areas. Zone pricing is essentially the same phenomenon as the senior citizen discount at the movie theater. That is, companies give a lower price to the more price sensitive consumers, like students and senior citizens.

Second, without the tool of zone pricing, refiners and retailers would likely be forced to withdraw from low-priced zones, reducing competition in those areas. Under uniform pricing, a refiner facing competition from a hypermarket could not reduce the wholesale price at that location without doing so in the entire terminal tributary area or, under some proposals, an entire state. In such circumstances, a refiner would be reluctant to lose margin in a large area in order to remain competitive in a smaller one. Thus, it might have little choice but to withdraw from the low-priced area, reducing competition further.

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[19] Testimony of Justine S. Hastings, Assistant Professor of Economics, Dartmouth University, Hearings on "Gas Prices: How Are They Really Set?," Permanent Subcommittee of Investigations of the Committee on Governmental Affairs, U.S. Senate April 30, 2002 at 114.

[20] Testimony of R. Preston McAfee, Professor of Economics, University of Texas, Hearings on "Gas Prices: How Are They Really Set?," Permanent Subcommittee of Investigations of the Committee on Governmental Affairs, U.S. Senate April 30, 2002 at 117.

A final critique of banning zone pricing comes from the possible reaction of refiners to such a rule. Refiners can evade the intent of a rule against zone pricing by vertically integrating, and operating their own retail outlets. To the extent that such outlets are less efficient than franchised dealers, this would harm refiners and consumers, as well as any (perhaps implicitly) displaced dealers.[21]

It is also quite common for jobbers to use zone pricing when they supply their own franchised outlets. (See Maryland Task Force, 2001 at 9.) In addition, some refiners are experimenting using zone pricing with jobbers, charging them a different price for gasoline at the rack, depending on the destination of that gasoline.

Vigdor (2003), following the analysis of a 1999 Federal Trade Commission consent decree,[22] outlines two possible anticompetitive theories of zone pricing. In the first, zone pricing facilitates tacit collusion in the marketplace. This is, however, a difficult theory to support. The general theory of tacit collusion (dating back to Stigler, 1964) is that the fewer issues upon which firms need to agree, the more likely collusion becomes. Zone pricing, by differentiating pricing areas, would appear to increase the number of items upon which firms need to agree. Further, as discussed above, each firm appears to have different size price zones, further increasing the scope of the tacit agreement. (See also Meyer and Fischer, 2004 at page 24, footnote 31.) Thus, by increasing the number of questions requiring agreement, zone pricing would appear to reduce the possibility of collusion.

Vigdor also outlines an entry deterring theory of zone pricing. According to this theory, incumbent firms seek to create a reputation for "hard dealing" by cutting prices dramatically (here creating new low priced zones) when entry occurs. This reputation serves to reduce the expected profits to a new entrant from entering, thereby acting to reduce future entry. Vigdor also posits such use of price zone would require new entrants to be of larger economic scale, though the reasoning on this point is not clear.

There are some difficult aspects to this theory, however. In particular, this theory suffers from a "chicken and egg" problem. Prices will naturally go down when new entry occurs. Further, prices can be expected to decline even further when the new entrant is a hypermarket that seeks to draw customers to its facility through low gasoline prices. Thus, it is very

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[21] This would not apply to those states that do not allow company owned operations. See Blass and Carlton (2001).

[22] Federal Trade Commission, "Analysis of Proposed Consent Order to Aid Public Comment in the Matter of Exxon Corporation and Mobile Corporation" http://www.ftc.gov/os/1999/11/exxonmobilana.pdf, November 30, 1999.

difficult to determine that prices, as a result of entry, decline further than they would simply by direct impact of entry, as a theory of entry deterrence would imply. Additionally, a rule that deters incumbents from lowering prices in response to entry may act as a cartel-stabilization device, deterring competition between the relevant firms.

6. ISSUES SURROUNDING NON-PRICE VERTICAL RESTRAINTS

6.1 The Motivation for Non-Price Vertical Restraints

As discussed above, refiners often allow independent operators known as "jobbers" to sell their branded gasoline in certain areas. The territory these jobbers can operate in, using that branded name and selling the refiner's gasoline, is, however, often highly restricted. Thus, refiners engage in a series of non-price vertical restraints with their jobbers that preclude them from selling gasoline outside their assigned territories.

Such jobbers have asked their elected officials to enact legislation to end such restrictions, which they refer to as "redlining." (Of course, it should be noted that the term "redlining" is a pejorative.) According to the FTC,[23]

> "[t]here are two general types of redlining: 1) territorial, in which the contract between the refiner and the jobber gives the refiner the right to refuse to approve the jobber's request to supply branded gasoline to independent stations or supply its own stations in specific price zones; and
> 2) site-specific, in which the contract includes financial disincentives for the jobber to sell in locations directly supplied by the refiner and prevents a jobber from shipping low-priced gasoline to stations located in high-priced zones."

Thus, eliminating these restrictions would allow jobbers to either sell gasoline into the relevant areas, or to locate their own stations in such areas.[24]

These restraints are useful to refiners because the price differential that causes them is required for refiners to recoup their investments in dealer operated stations. Such investments include developing distribution systems, siting costs, financial support, and responsibility for

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[23] See http://www.ftc.gov/os/2001/05/wsgpiswindle.htm.

[24] It appears that jobbers believe that in such circumstances the territorial protections they have with refiners would continue to exist.

environmental concerns. Thus, non-price vertical restraints are clearly useful tools for brand support. They allow both the refiner and the franchised dealer to engage in brand investment without the threat of "free-riding" on those brand investments by a jobber. Should these territorial restrictions be prohibited, refiners can be expected to act in at least one of two different ways. First, they may restrict investments in their brands. Second, they may reduce the number of jobbers they use, or choose not to use jobbers when expanding their distribution channels, replacing them with less efficient forms of distribution. Neither outcome would serve the consumer interest.

6.2 Antitrust and Non-Price Vertical Restraints

Since the 1977 *Sylvania*[25] decision, under the antitrust laws, non-price vertical restraints have been evaluated under the standard of "rule of reason." This rule implies that for a plaintiff to succeed in such a case, it must show a logical theory of consumer injury, and that the balance of the evidence supports that theory. It cannot be stressed enough that the focus of antitrust enforcement is the protection of consumers and economic efficiency, rather than the protection of individual competitors.

A theory of anticompetitive behavior has several elements. First, the firms using the practice at issue must be competing in a relevant product and geographic antitrust market. Second, the firms using the practice at issue must, together, have market power in the relevant market. Third, the use of the practice must in some logical manner encourage supra-competitive pricing, in this context generally through enhancing tacit collusion. Fourth, any anticompetitive resulting behavior must outweigh the impact of any efficiencies from these practices.

Each of these factors may be important in the determination of the outcome of an antitrust case. For example, if the two firms being sued for collusive behavior in a matter do not compete head to head, that is likely to be a fatal flaw in a case. If the firms at issue constitute only a small portion of a market, say 10 percent, then that also is a fatal flaw in a case.

The third condition, the necessity of an anticompetitive theory, can also be problematic. For example, assume that the firm using the practice at issue is dominant in the market, and no other firms use the practice, and that a tacit collusion hypothesis is theorized. In this case the dominant firm is unlikely to be colluding with any of its rivals, so the relevant restraint is unlikely to be harming consumers.

With respect to the fourth condition, non-price vertical restraints can have pro-consumer, efficiency rationales. Refiners invest in a variety of

[25] Continental T.V. Inc. v. GTE Sylvania Inc (1977) 433 U.S. 36.

promotional and other activities for franchised dealers. They recoup these investments through higher wholesale margins. If the direct service operator can obtain the relevant brand of gasoline from another, say a local jobber, then it will be "free riding" on the refiner's investment. Thus, non-price vertical restraints serve to protect the refiner's investment in the franchised dealer's location. (For a broader discussion of these issues, see Klein and Murphy, 1988.)

Franchisees who take exception to a refiner's actions have recourse in the courts, under the antitrust laws. However, it is clear that under the antitrust laws the chances of successful litigation are extremely limited. Indeed, according to a position paper prepared for the jobber trade group, the Petroleum Marketers Association of America (PMAA, Bassman, Mitchell and Alfano, 2003), "With respect to the antitrust laws, the landmark decision of the United State Supreme Court in *Continental T.V., Inc. v. GTE Sylvania Inc.*, [433 U.S. 36 (1977)] all but dooms jobber hopes of finding a basis in the antitrust laws to attack redlining." The reason for this is clear: non-price vertical restraints in this industry are unlikely to harm consumer welfare.

The PMAA, however asserts that non-price vertical restraints should be eliminated to enhance what is referred to as "intrabrand competition." Intrabrand competition occurs when independent distributors in the same market sell the same product from a particular (upstream) firm. For example, consider the example of AT&T's sales of cellular phones. In many areas AT&T sells cellular telephones through both its own corporate stores and through independent franchises. The competition between the two is referred to as "intrabrand competition." Such "competition" would be reduced were AT&T to eliminate its independent franchises. But there is no reason to conclude that consumers would be injured.

If AT&T has market power in the relevant area, it has that power whether or not it uses independent franchises as well as company owned stores. In either circumstance, AT&T can control (through setting retail and/or wholesale prices) the quantity of cellular telephones sold. Therefore, there are no purely "competitive" implications that arise from an AT&T decision to allow, or to end, "intrabrand competition" in its own product. The same analysis holds true for a gasoline refiner deciding how it should distribute its own product. (For a fuller discussion of these issues, see Liebelier (1982).)

7. WHOSE INTERESTS ARE BEING SERVED?

Charges against refiners' administration of their retail gasoline distribution network often come from jobbers and other competitors of refiner affiliated stations, as well as from franchised dealers and their trade

associations. As Baumol and Ordover (1985) point out, however, these actors often have economic interests that are contrary to both the refiners and the final consumer.

The purpose of the antitrust laws, and public policy in general, is to protect the interests of the consuming public. It is not to increase the profits of any level or type of distribution. Thus, as the old antitrust saying goes, "there is a difference between protecting competition and protecting competitors." Protecting competition means moving to provide customers with the lowest sustainable prices, not protecting the profits of any level of production or any individual firm.

Market participants, therefore, are not always friends of the antitrust laws or the general public interest. Being economic agents, they prefer higher profits to lower profits for their segment of the network. They can gain higher profits through their marketplace actions. They may also be able to gain profits through political activity, at the expense of consumers.

Jobbers have worked with their political representatives in attempts to end vertical restraints. The reason for this is simple: these vertical restraints limit jobber profit opportunities, by restricting the places they can sell gasoline. Dealers have reasons to desire the end of zone pricing, if, as the results of Deck and Wilson (2003) indicate, eliminating zone pricing, while raising prices to consumers, shifts profits away from refiners and toward station owners.

One should remember that refiners, although they clearly prefer higher profit to low, have, from society's point of view, the proper incentives to choose their own distribution methods. Refiners prefer low cost distribution methods to high cost methods, everything else being equal. The reason for this is simple: the lower the cost of distribution, the higher the profits of the refiners, and, at the same time, the lower the price to consumers. If refiners choose not to use jobbers in particular areas, that decision can be expected to be generated by the refiner's belief that jobbers do not represent the lowest cost method of distribution in those areas.

8. Retail Margins

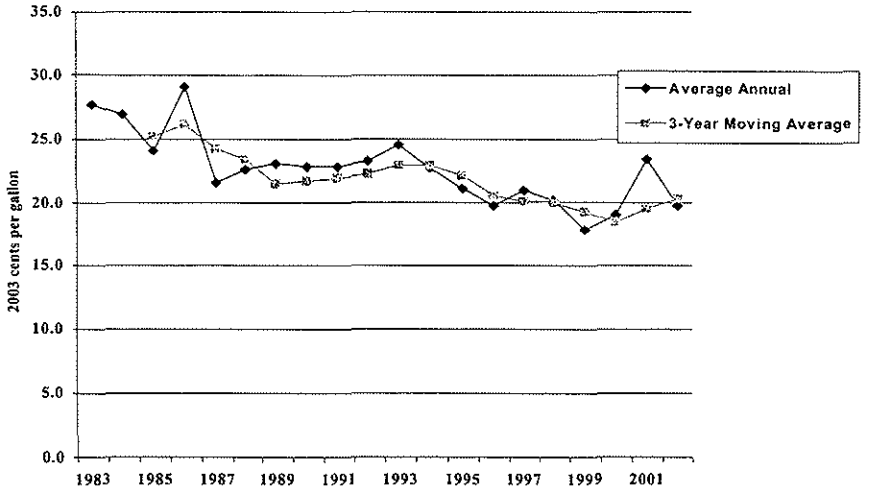
In the end, the best way of analyzing the retail gasoline sector is by the extent of margins in the sector. The lower the margins, the lower prices are to consumers.

Figure 3 graphs out the average retail margins for gasoline in the U.S. from 1983, in constant 2003 dollars.[26] It is clear that since 1983 there has been an important decline in retail gasoline margins.

The average retail margins for gasoline in the U.S. from 1983, in constant 2003 dollars, have declined about 8 cents per gallon, from $0.277 per gallon in 1983 to $0.197 per gallon in 2002, a drop of 29 percent. It appears, however, that margins fluctuate when measured on a yearly basis. Given this, it may be more accurate to examine retail margins by using three year moving averages. Employing this metric, we observe that margins fell an average of 5 cents per gallon, from $0.252 in 1985 to $0.203 in 2002, a decline of 19 percent.

Thus, the trend is clear. Margins have been decreasing in the retail gasoline segment.

Figure 3
Retail Gasoline Margins, 1983-2002



Source: EIA, Petroleum Marketing Annuals.

[26] Retail margins are calculated as the difference between the average retail price of all types of gasolines (excluding federal and state excise taxes) and the refiner sales price. See for example, Energy Information Administration, Monthly Energy Review, August 2003, http://tonto.eia.doe.gov/FTPROOT/multifuel/mer/00350308.pdf.

CONCLUSION

Gasoline refiners seek to get their product to market in the least costly method. In this process, while protecting their valuable brand name reputations, they manage the relationship between different retail distribution channels, each with its own advantages and disadvantages.

Each distribution channel aids refiners in the marketing of gasoline. The interactions between these distribution channels, however, create competitive tensions with regard to brand free-riding and brand network operations. The use of price zones and non-price vertical restraints allow integrated refiners to offer retail distribution outlets across as many markets as possible. Such provisions have been the subjects of antitrust scrutiny, but these actions have not resulted in successful litigation. The reason for the lack of success for plaintiffs in the antitrust area is clear: these actions are not likely to harm consumers.

REFERENCES

Areeda, P., and H. Hovemkamp (2004) *Antitrust Law,* New York, Aspen Books.

Bai, C. and Z. Tao (2000) "Contract Mixing in Franchising as a Mechanism for Public-Good Provision", *Journal of Economics and Management Strategy,* 9:1 pp.85-113.

Barron, J.M., and J.R. Umbeck, (1984) "The Effects of Different Contractual Arrangements: The Case of Retail Gasoline Markets", *Journal of Law and Economics,* 27:2 pp.313-328

Bassman, R., J. Mitchell. and C. Alfano (2003) "PMAA White Paper on Refiner Redlining in Historic Independent Marketer Territories", (prepared For the Petroleum Marketing Association of America) *presented at the Spring 2003 Meeting of the American Bar Association Antitrust Section*

Baumol, W.J., and J.A. Ordover (1985) "Use of Antitrust to Subvert Competition", *Journal of Law and Economics,* 28:2 pp.247-265.

Blass, A.A., and D.W. Carlton (2001) "The Choice of Organizational Form in Gasoline Retailing and the Cost of Laws That Limit That Choice", *Journal of Law and Economics,* 44:2(1) pp.511-524.

Borenstein, S. and A. Shepard (1996) "Dynamic Pricing in Retail Gasoline Markets", *RAND Journal of Economics,* 27:3 pp.429-51.

Carlton, D.W., and J.M. Perloff (2000, 3rd edition) *Modern Industrial Organization,* New York, Addison-Wesley.

Comanor, W.S., and J.M. Riddle (2003) "The Costs of Regulation: Branded Open Supply and Uniform Pricing of Gasoline", *International Journal of the Economics of Business* 10:2 pp.123-143.

Deck, C.A., and B. J. Wilson (August 2003) "Experimental Gasoline Markets", *Working Paper*, George Mason University.

Dutta, S., M. Bergen, J. Heide and G. John (1995) "Understanding Dual Distribution: The Case of Reps and House Accounts", *Journal of Law, Economics and Organization* 11:1 pp.189-204.

ExxonMobil, "National Standards Evaluation", undated.

Federal Trade Commission (August 2004) "The Petroleum Industry: Mergers, Structural Change, and Antitrust Enforcement", *Report of the Bureau of Economics.*

Keeley, M.C., and K.G. Elzinga (2003) "Uniform Gasoline Price Regulation: Consequences for Consumer Welfare", *International Journal of the Economics of Business* 10:2 pp.157-168.

Klein, B. (1995) "The Economics of Franchise Contracts", *Journal of Corporate Finance*, 2:1 pp.9-37.

Klein, B., R.G. Crawford, and A.A. Alchian (1978) "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process", *Journal of Law and Economics* 21:2, pp.297-326.

Klein, B. and K.B. Leffler (1981) "The Role of Market Forces in Assuring Contractual Performance", *Journal of Political Economy*, 89:4 pp.615-41.

Klein, B. and K.M. Murphy (1988) "Vertical Restraints as Contract Enforcement Mechanisms", *Journal of Law and Economics* 31:2 pp.265-297.

Lafontaine, F. and K.L. Shaw (1999) "The Dynamics of Franchise Contracting: Evidence from Panel Data", *Journal of Political Economy* 107:5 pp.1041-1080.

Liebelier, W.J. (1982) "Intrabrand "Cartels" under GTE Sylvania", *UCLA Law Review* 30 pp.1-69.

Marvel, H.P. (1995) "Tying, Franchising, and Gasoline Service Stations", *Journal of Corporate Finance* 2:1-2 pp.199-225

Marvel, H.P. (2003) "On the Economics of Branded Open Supply", *International Journal of the Economics of Business,* 10:2 pp.213-223.

Maryland Task Force Report on Gasoline Zone Pricing, September 14, 2001.

Meyer, D.W., and J.H. Fischer (March 2004) "The Economics of Price Zones and Territorial Gasoline Marketing", *Federal Trade Commission Working Paper,* http://www.ftc.gov/be/workpapers/wp271.pdf

Petroleum Marketing Law Institute (Undated) "The Petroleum Marketing Practices Act", www.pmlis.com/pmpa.html.

Rockne, J. (2001) "Got Gas? An Introduction to the Petroleum Marketing Practices Act", www.sba.org/DeNovo/2001/04/pmpa.htm.

Shaffer, G. and Z.J. Zhang (1995) "Competitive Coupon Targeting", *Marketing Science,* 14:3 pp.395-416.

Shepard, A. (1993) "Contractual Form, Retail Price, and Asset Characteristics in Gasoline", *RAND Journal of Economics,* 24:1 pp.58-77.

Shapiro, C. (1983) "Premiums for High Quality Products as Returns to Reputations", *Quarterly Journal of Economics,* 98:4 pp.659-679.

Slade, M.E. (1996) "Multitask Agency and Contract Choice: An Empirical Exploration", *International Economic Review,* 37:2 pp.465-486.

Stigler, G. (1964) "A Theory of Oligopoly", *Journal of Political Economy,* 72:1 pp.44-61.

Vigdor, W.R. (April 2, 2003) "Antitrust Treatment of Zone Pricing and Redlining", *ABA Section of Law Course Materials.*

Viscusi, K., J. Vernon, J., and J. Harrington (1992) *Economics of Regulation and Antitrust,* New York, D.C. Heath.