

Economics at the FTC: Cases and Research, with a Focus on Petroleum

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Abstract: Economics at the Federal Trade Commission (FTC) covers both the antitrust and consumer protection missions. In this year's essay, we focus mainly on the competition-side of the agency. Drawing on a wealth of recent research, we provide descriptive and analytical information about the petroleum industry. Mergers, as always, were a major preoccupation of the FTC, and we discuss a few oil industry mergers as well as one leading litigated case – Arch Coal's acquisition of Triton Coal. Finally, we review the empirical literature on the effects of vertical restraints, noting that the literature supporting an animus toward such restraints is surprisingly weak.

Keywords: antitrust, consumer protection, FTC, mergers, petroleum, vertical restraints.

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I. Introduction

The Federal Trade Commission's (FTC) Bureau of Economics (BE) is composed of 70 PhD-level economists, a small cadre of accountants, and 25 other staff who support the FTC's two missions of promoting competition (antitrust) and protecting consumers. The bulk of the work done by the Bureau is related directly to law enforcement activities – case investigation or litigation support. Other work involves policy issues and research related to the two missions.

On the antitrust side this year, merger activity picked up, and we were busy with numerous investigations, including several in the gaming industry in Las Vegas, Lake Tahoe, and elsewhere. Consumer products also got attention with Wrigley's purchase of Altria's non-chocolate confectionery brands. Pharmaceuticals were examined in connection with Genezyme's purchase of ILEX Oncology and the implications of that merger for the marketing of immunosuppressant drugs used for solid organ transplants. In addition, Blockbuster's planned acquisition of Hollywood's movie rental/retailing business kept a few economists busy during the winter of 2004–2005.

On the research front, economists (sometimes in conjunction with the FTC's legal staff) completed four reports this year. Those studies included: a survey of consumer experiences with fraud, a discussion of the petroleum industry and mergers in that industry over the past 20 years, a report on the major factors that drive retail gasoline price levels, and a report describing some of the determinants of FTC merger enforcement decisions in the recent past.¹ Notably, two of the four studies focus on the oil industry, as will this article.

On the advocacy front, where the agency provides advice to other federal and state agencies or legislatures, economists worked with the FTC's Office of Policy Planning on a range of issues

¹ In addition to producing reports, economists completed several working papers. The recent papers in the Bureau of Economics (BE) Working Paper series, which began in 1977, are available on the FTC website at <http://www.ftc.gov/be/econwork.htm>. An economist working with the Office of Policy Planning (OPP) also completed a study of competition among contact lens providers (FTC, 2005b), and another July 2003 OPP/BE study of internet sales of wine (Ellig and Wiseman, 2003) played an important role in informing the U.S. Supreme Court's recent decision striking down certain state restrictions on the interstate sale of wine. *Granholm et al. vs. Heald et al.*, 125 S. Ct. 1885.

from the regulation of pharmacy benefit management firms, to electricity marketing, to contact lens competition. Most recently, we have been concentrating on the characteristics of the real estate market and efforts by various parties to set minimum service requirements for agents or to require that attorneys be present for real estate closings.²

In the consumer protection area, last year our article in this journal discussed research issues, focusing on (1) the regulation of food health claims and its effects on food marketer incentives, and (2) the potential for consumer harm from badly designed mandated disclosures for mortgage loans (Froeb et al., 2004). We are still very active in those areas, but this year we have focused more on providing support for cases involving debt management firms that allegedly fail to perform the debt consolidation, debt reduction, and financial management services that they claim to offer consumers.

We also continue to be interested in negative option marketing – a marketing practice that alters the “normal” mechanisms of trade between consumers and sellers. In most retail markets, positive option marketing is the norm. In positive options, the seller presents an offer, and the customer either accepts the offer or the potential transaction ends. That is, the customer must opt-in to the transaction. In negative option marketing, the default is reversed. The consumer must actively reject the offer (opt-out), or the transaction occurs. This change in the traditional rules of exchange alters the transactions costs involved in marketing. Because many consumers do not expect to be faced with negative option offers, and because the default mode is often critical in determining the outcome of a transaction, clear disclosure of the terms of the offer are necessary to avoid misunderstandings and deception. Negative options have been around for decades in the monopoly utility services area and for book and record clubs. For most other sales, they are more novel, but legitimate marketers appear to be making greater use of negative option plans tied to initial one-time offers of “free” goods or services.

A final area of economist activity involves international issues. Economists participate in training and technical assistance programs for law enforcers in other countries, and contribute to policy discussions aimed at narrowing differences in the international enforcement of competition and

² For a complete list of the recent FTC advocacy filings, see <http://www.ftc.gov/be/advofile.htm>.

consumer protection laws. Coordination across different countries is becoming more important for both firms and consumers. In addition, more countries are developing competition laws, so we are assisting newly-formed competition authorities.³

The FTC's international program consists of technical assistance missions to competition and consumer protection authorities in transitioning economies, and visits from personnel from foreign competition and consumer protection agencies who have come to Washington, DC.⁴ During the past year, staff economists participated in short-term missions to countries from Croatia to the Philippines, and the programs included training sessions on topics ranging from abuse of dominance, to electricity sector competition issues, to the economics of consumer protection, to portfolio effects in conglomerate mergers. During that same period, FTC staff economists prepared for visits from agency counterparts from four continents, and provided training on a variety of topics, including the role of the economist and economic evidence in merger investigations, abuse of dominance and monopolization, and competition policy R&D (e.g., retrospective studies of mergers). One of the more common requests for training was to explain how we incorporate empirical analysis into antitrust investigations. In response, we shared our experience with econometric methods of demand estimation and quantitative techniques for measuring merger effects.

In addition to the provision of training, economists traveled to the capitals of Europe to consult with economists at the European Commission, the OECD, and individual competition authorities. These journeys provided opportunities to exchange ideas on monopolization and market dominance theories, quantitative methods in merger analysis, the importance of empirical evidence on the effects of vertical restraints, and the difficulty of generating antitrust cases via industry-wide studies. Agreement on these issues among economists would go a long way toward encouraging convergence in antitrust regimes throughout the world.

³ Currently, more than 70 countries regulate mergers.

⁴ Another aspect of the program is the opportunity for economists to contribute to U.S. (FTC/DOJ) submissions to the OECD on competition and consumer protection roundtable topics (e.g., the impact of substitute services on regulated telecommunication, postal and rail sectors) and to comment on draft reports by the OECD (e.g., structural separation in regulated industries) and other international organizations.

Previous editions of this Antitrust and Regulatory Update article reported on economists' roles in antitrust cases. Last year's contribution focused mainly on research and advocacy activity connected to our antitrust and consumer protection missions. This year, we combine the law enforcement and research roles, focusing on both casework and research in the petroleum industry. In addition, we briefly discuss one of our major cases in the past year, the Arch Coal/Triton merger. Finally, we examine vertical restraints and the role that economists have played in the U.S. and the EU in trying to reach a common understanding regarding the empirical evidence in connection with theories of the anti-competitive effects of vertical restraints.

II. The Petroleum Industry

The petroleum industry has long been a major focus at the FTC (Scheffman and Coleman, 2002). This past year has been no exception. The FTC released two major economic reports on the industry and sponsored a conference on the empirical estimation of the price effects of petroleum mergers and market concentration. FTC economists also produced a review of the economics of gasoline zone pricing, a paper applying a proposed screen for collusion to data in one retail gasoline market, and another petroleum merger retrospective. FTC economists also continued monitoring gasoline prices at the wholesale and retail level. Last but not least, recent petroleum mergers have been closely scrutinized, and the FTC has obtained competitive relief when appropriate. We now report on these developments in more detail.

1. THE PETROLEUM MERGER REPORT

In August 2004, the FTC's Bureau of Economics released a major report entitled, *The Petroleum Industry: Mergers, Structural Change, and Antitrust Enforcement* (Petroleum Merger Report).⁵ The Petroleum Merger Report was the third FTC study since 1982 to examine structural change and other evolving conditions in the petroleum industry. Like its predecessors, the report had two basic goals: to inform public policy about competitive conditions in the industry and to make more transparent how the FTC analyzes mergers and other competitive issues in this industry. The report reviewed industry trends in production, pricing, capital expenditures, rates of return,

⁵ The Petroleum Merger Report is available at <http://www.ftc.gov/os/2004/08/040813mergersinpetrolberpt.pdf>

margins, and import and domestic product flows. Separate chapters were dedicated to structural trends and competitive issues at specific industry levels: crude oil production and reserves; bulk transport of crude oil; refining; bulk transport of refined products; and product terminals and gasoline marketing.

The report also measured acquisition and divestiture activity among a defined group of leading petroleum companies (LPCs) for the period between 1985 and 2001, thereby updating the data series of the predecessor reports that began in 1971. The report found three distinct periods of LPC merger activity. Between 1985 and 1990, LPCs acquired somewhat more assets than they divested. The second period, 1991 through 1996, saw less overall merger activity, with LPCs divesting more assets than they acquired by a substantial margin. The third period, between 1997 and 2001, saw an extraordinary increase in merger activity, including a number of very large whole-company consolidations among LPCs. The high level of merger activity in this period was significantly greater in real terms than that of the petroleum merger wave of the late 1970s and early 1980s.

Although it was difficult to make any strong generalizations about the business motivations associated with this recent period of industry restructuring, the report's review of publicly available information indicated that "operating synergies" or "organizational efficiencies" were frequently cited rationales. The claimed savings often appeared to be related to administrative and corporate overhead functions, including reductions in staff. Other claimed savings were related to integration of refinery systems, pipeline systems or other distribution systems. Achieving greater economies in crude oil exploration and development also was mentioned as a motivation for some mergers.

One of the report's general observations was that scale economies have become increasingly important at many industry levels. Consolidation among the smaller, independent crude oil producers since the mid-1980s is consistent with apparent gains to scale in exploration and production, the so-called "upstream" level of the industry. The report noted that some analysts believed that mergers among the major oil companies were motivated by scale advantages in bearing the greater risks and costs as the worldwide search and development of new, large oil fields increasingly involved remote or politically inhospitable areas.

At the downstream level, which consists of refining, product distribution and marketing, average plant size at various industry levels has increased over time. The number of refineries in the U.S. has declined, while average refinery size has increased. Refinery closures have overwhelmingly involved relatively small, unsophisticated facilities.⁶ There also appear to be advantages in the operation of multiple refineries. For example, a firm with multiple refineries might be able to make more efficient use of capacity at each refinery through movement of feedstocks, intermediates, and blend-stocks across refineries. Product pipelines are subject to economies of scale, and while there have been instances of significant entry of new pipelines (generally conversions of crude or natural gas pipelines), most of the increased demand for pipeline transportation of refined products since the mid-1980s has been met by expanding the capacity of existing systems.

At the marketing level, the number of retail gasoline stations has declined, although average volume per station has increased considerably since the 1980s. There also has been consolidation among independent wholesalers of gasoline and other refined petroleum products, motivated at least in part by increasing capital requirements, the competitive pressures from the expansion of hypermarkets (such as grocery stores, club stores and mass marketers like Wal-Mart) in gasoline sales, and imposition of minimum volume requirements by major branded oil companies.

At the same time, some levels of the industry have undergone retrenchment as demand for their services has fallen. For example, cost-cutting changes in inventory holding practices have reduced the demand for product terminal services. As a result, marginally profitable product terminals have been closed, and firms have increased joint use of underutilized terminals through product exchanges, joint ventures, and other contractual arrangements. Similarly, declining US crude oil production has resulted in excess capacity and the closing of many crude oil pipelines. Some of these underutilized crude oil pipelines have been converted to other uses. Some major crude oil pipelines, however, particularly those carrying imported crude oil from Canada or other sources to U.S. refiners, have significantly increased capacity since the mid-1980s.

⁶ The trend toward fewer, but larger sized US refineries is by no means a recent development, but goes back at least 60 years, interrupted only during the 1970s through 1980, when government controls on the pricing and allocation of

The report found that there were increases in industry concentration over the period, although mergers were responsible for only part of these increases. The report found that most sectors of the downstream petroleum industry at the national, regional, or state level have generally remained unconcentrated or moderately concentrated. For example, national level refinery capacity HHI⁷ increased from 493 points in 1985 to 728 points in 2003. At the regional levels defined by Petroleum Administration for Defense Districts (PADDs), the refining capacity HHI remained under 1,400 for PADDs II through IV.⁸ While concentration in refining in PADD I has increased above this level, this capacity concentration measurement does not reflect sizable pipeline and marine shipments into PADD I from the Gulf Coast and foreign imports. While generally increasing somewhat during the 1990s, wholesale and retail concentration measured at the state level remained unconcentrated or moderately concentrated in most cases. In addition, the growth of independent gasoline marketers with high volume formats such as Sheetz, RaceTrac, and hypermarkets has increased competition at the wholesale and retail level in many areas.

As for concentration at the upstream level, world concentration in crude oil production has fallen since the mid-1980s, and production is unconcentrated. World concentration in reserves has been somewhat higher than production concentration, although as of 2002 its HHI was also under 1,000, primarily the result of Canadian oil sands being considered economic for the first time.⁹

crude oil provided incentives to operate relatively small and inefficient refineries. The elimination of these government controls in 1981 resulted in the exit of many small refineries.

⁷ Here the HHI is the Herfindahl-Hirschman Index of concentration, calculated as the sum of the squared capacity shares of the firms in the industry. The figures do not necessarily correspond to market concentration in any well-defined relevant antitrust market.

⁸ PADDs were defined in 1950 for purposes of collecting and maintaining petroleum industry data by the federal government. PADD I comprises New England and the Eastern Seaboard; PADD II is the Midwest; PADD III is made up of the Gulf Coast states; PADD IV is made up by the Rocky Mountain states; PADD V includes the West Coast states plus Alaska and Hawaii.

⁹ Both U.S. domestic production and reserves remain unconcentrated. However, the U.S. currently imports over 60% of its crude oil needs. As a result, aside from possible instances when particular U.S. refiners might be vulnerable to a price increase if a merger were to consolidate a significant fraction of control over certain types of oil (as the FTC alleged in challenging BP's acquisition of ARCO's Alaskan North Slope production assets in 2000), the general competitive significance of domestic concentration in crude oil is very limited (Bulow and Shapiro, 2004).

Privatization of state-owned oil companies since the 1980s and the breakup of the Soviet Union have been important deconcentrating forces in crude oil production and reserves. However, if OPEC nations are considered to be one entity, world-level crude oil concentration would be significantly higher. For example, in 2002 treating OPEC as a single entity would result in a world production HHI of 1,680 and a world reserves HHI of 4,582.¹⁰ These estimates overstate concentration to the extent that coordination among OPEC members is imperfect.

The report found that mergers of private oil companies have not significantly affected worldwide concentration in crude oil. This fact is important because crude oil prices are the chief determinant of gasoline and other refined petroleum product prices. For example, Exxon and Mobil, which merged in 1999, in the previous year had worldwide shares of crude oil production of 2.1% and 1.3%, respectively. The firms' merger increased world level concentration in production from 288 to 293. The effect of mergers among private oil companies on concentration in world reserves has been even smaller. Exxon and Mobil, for example, held only 0.7% and 0.5% of world crude oil reserves in the year prior to their merger.

While the horizontal scale of operations at some levels in the petroleum industry has tended to increase, this has not been accompanied by an increase in vertical integration. Rather, vertical integration between crude oil production and refining has tended to decline. The incentives for vertical integration may have diminished as refineries have become more flexible in the types of crude oil they can process efficiently. The development and expansion of spot and futures markets also appear to have reduced the risks of acquiring crude oil through market transactions relative to relying upon vertical integration and intra-company transfers. At the marketing level, refiners have generally sold an increasing share of gasoline at product terminals to jobber distributors and a declining share at retail stations they own or to which they directly deliver gasoline. The West Coast is an exception, where the share of refiners' gasoline sold through refiner owned or directly supplied stations has increased somewhat in recent years.

The Petroleum Merger Report also provides a detailed discussion of the FTC's merger

¹⁰ This estimate assumes that nations outside North America are the relevant competitive entities, while firms are the relevant competitive entities in the U.S. and Canada. For additional details on estimation of crude oil concentration, see the Petroleum Merger Report, Chapter 5.

enforcement actions in the petroleum industry during the past 20 years. As of August 2004, the FTC had taken enforcement actions against 15 major petroleum mergers that likely would have resulted in significant reductions in competition in one or more relevant markets, had the transaction been allowed to proceed unaltered.¹¹ The FTC's goal in challenging a transaction has been to maintain the pre-merger level of competition in the identified relevant markets. In 11 cases this was achieved through consent agreements with divestiture of assets, including interests in 15 refineries and numerous, substantial interests in pipelines, terminals and marketing. In the four other cases, the mergers were either abandoned or blocked following FTC or court action. In addition to providing factual detail about these enforcement actions, such as the identities of the relevant antitrust markets, data on concentration in these markets, the theory or theories of anticompetitive concern, and the result of required remedies, the report articulates how the FTC applies the methodology of the DOJ/FTC Horizontal Merger Guidelines to specific circumstances in petroleum mergers. Among other things, the report notes that the FTC has taken enforcement actions in petroleum markets affected by mergers at lower HHI levels than in other industries.

2. REPORT ON GASOLINE PRICE CHANGES

In July 2005 the FTC released a report titled *Gasoline Price Changes: The Dynamic of Supply, Demand and Competition* (Gasoline Price Report). This report, to which Bureau economists were major contributors, was motivated by widespread concerns in recent years about increasing gasoline prices and increases in volatility of gasoline prices. Drawing on the FTC's experience in investigating competitive issues affecting gasoline markets and learning from the FTC's Gasoline and Diesel Price Monitoring Project, FTC hearings on gasoline prices in 2001 and 2002, and research and analyses of other government agencies, industry trade associations and academics, the Gasoline Price Report examined the supply and demand factors that are the primary drivers of both gasoline price levels and price spikes.

The report first considered the forces affecting gasoline prices nationally. Here the focus was on crude oil, the price of which has explained about 85% of the changes in U.S. gasoline prices over

¹¹ Three recent petroleum-related enforcement actions are briefly reviewed in Section 8.

the last 20 years. The report next turned to market factors affecting gasoline prices regionally. This discussion examined the bulk supply infrastructure (refineries and pipelines) in the U.S. and how regional differences in bulk supply access matter to regional prices and price spikes. The impact of boutique fuel specifications required by environmental rules upon regional prices was also considered. Finally, the report turned to specific factors affecting retail gasoline prices at the state and local level. Among the factors considered here were the relationship between gasoline station density and retail prices, changes in gasoline retail formats, state and local taxes, vertical restraints and integration affecting the wholesale and retail levels, and legislative bans on self-service sales and on sales below costs.

Some of the Gasoline Price Report's more interesting findings (pp. 106– 108) were derived from analyses coming out of the FTC's Gasoline and Diesel Price Monitoring Project, which is discussed further below. One example illustrated the competitive significance of new retail formats upon gasoline prices. During late 2002 and early 2003 local media in California's Siskiyou County reported on large price differences between local gasoline stations and those in the nearby city of Redding. During the late 1990s, the retail price difference between these two areas was about three cents per gallon, which appears to be roughly the extra transportation costs to deliver gasoline from product terminals to Siskiyou County compared to Redding. In 2001, the price difference grew to an average of 15 cents per gallon. However, closer analysis showed that while prices in Siskiyou County increased relative to Redding, the price difference between Siskiyou County and San Francisco (the nearest refining center that supplies gasoline to both areas) remained roughly the same. This suggested that rather than increasing in Siskiyou County, prices fell in Redding. Indeed further inquiry revealed that Redding had been experiencing significant new entry in gasoline retailing from high volume discount stations such as ARCO and Beacon, along with hypermarkets such as Safeway.

The Gasoline Price Report also drew upon work from the Price Monitoring Project to analyze factors responsible for recent increases in the volatility of gasoline prices. Many industry observers have believed that the balkanization of gasoline into many differing fuel specifications to satisfy environmental regulations has increased the volatility of gasoline prices. Certain regions of the country require different specifications of gasoline, which may change seasonally.

These specifications are often referred to as “boutique fuels”. Some examples of boutique fuels are California Air Resource Board (CARB) gasoline and reformulated gasoline (RFG).

Among other things, the report compared gross margin variability of various boutique fuels in the Gulf Coast region (where 47% of U.S. refining capacity is located) to determine if lower volume gasoline products (and presumably more thinly traded products) have been more subject to price spikes.¹² By focusing on Gulf bulk spot prices, this analysis focuses on the production of the boutique fuels rather than their local wholesale or retail distribution. The results showed that the standard deviations of gross margins for various boutique fuels in the Gulf are not statistically significantly different from the standard deviation of Gulf margins for conventional gasoline, indicating that at this industry level boutique fuels, at least compared with conventional gasoline, are not associated with greater price volatility.¹³

The report found, however, that boutique requirements and differences among areas’ refining and supply infrastructure may interact to generate significant regional differences in price volatility. For example, gross margin volatility for CARB gasoline is significantly higher than for conventional gasoline in the Gulf. Several factors contribute to this difference. A typical refinery outage would affect a larger share of California’s local supply compared to the Gulf, and because Gulf supply is connected to the East Coast and Midwest (both large consuming areas), any disruption in the Gulf can be spread over many more consumers than can a similar disruption in California. Moreover, California’s inability to substitute gasoline from other refinery regions or to import foreign-produced gasoline without significant delay makes it more vulnerable to price volatility than is the Gulf, which can deal with local supply disruptions by somewhat reducing its sizable pipeline or marine exports to other parts of the country.

Similarly, the report observed that price volatility of conventional gasoline is very similar in the southeastern and mid-Atlantic states, which are traversed by two large product pipelines supplied by Gulf Coast refineries. RFG gross retail margins in Virginia, on the other hand, were found to

¹² The gross margins were defined as the difference between the spot prices of the boutique fuels and the spot price of West Texas Intermediate crude oil.

¹³ Although the variabilities of conventional and boutique fuels were similar, average gross margins for boutiques are higher than for conventional gasoline, reflecting their higher production costs.

be more volatile than RFG margins in Texas. While conventional gasoline is sold all along the pipelines, no states between Texas and Virginia require RFG. Therefore, while local changes in supply or demand for conventional gasoline generally can be relatively easily accommodated by making inventory and supply adjustments across nearby delivery points along the pipelines, adjustments in response to changes in RFG demand in Virginia take longer since these changes must involve production or shipping decisions in the more distant Gulf.

3. CONFERENCE ON ESTIMATING THE PRICE EFFECTS OF MERGERS AND CONCENTRATION IN THE PETROLEUM INDUSTRY

In January 2005 the FTC sponsored a conference on empirical estimation of the price effects of mergers and concentration in the petroleum industry.¹⁴ The conference was precipitated by a May 2004 report by the U.S. Government Accountability Office (GAO), which concluded that mergers from the mid-1990s through 2000 generally led to higher wholesale gasoline prices, although the GAO report found numerous instances where no significant (or a negative) effect on price was associated with a merger (Government Accountability Office, 2004). GAO found that increased concentration also led to the higher gasoline prices. These findings led some observers to question whether the FTC's approach to merger enforcement in petroleum was off target and whether too little competitive relief was being secured by the agency. In contrast, FTC economists Christopher Taylor and Daniel Hosken (Taylor and Hosken, 2004) had analyzed one of the mergers included in the GAO's study (Marathon and Ashland's joint venture of 1998) and found no price effects at either the retail or wholesale level that could be attributed to the transaction. The conference was called to review the findings and methodologies of these competing analyses with an ultimate goal of better informed enforcement decision-making.

The FTC invited five leading economic experts to participate in panel discussions of the major issues raised by the two studies. The first panel, chaired by Jerry Hausman, considered identification issues in merger event studies. Among other things, this panel discussed the different approaches of the GAO and FTC studies in identifying merger effects and highlighted crucial assumptions in each study. For example, the FTC study, which might be termed a

¹⁴ Conference agenda, submissions and transcripts available at <http://www.ftc.gov/ftc/workshops/htm>

matching model, relied on the critical assumption that control cities were truly not affected by the transactions, whereas time effects and demand and supply changes were common to the control cities and to the area or areas affected by the merger. GAO's "regression approach" relied on the critical assumptions that the relevant supply and demand factors were correctly controlled for, that the control variables' effects on prices were the same in areas both affected and not affected by the merger, and that the relationship between prices and the control variables did not vary pre-and post-merger. Specific suggestions for robustness testing and alternative model specifications were also made for both the FTC and GAO studies. Panelist Scott Thompson raised a more fundamental point that if mergers themselves are endogenous, the one-way causality between mergers and prices assumed by both the FTC and GAO studies may be overly simplistic. Overall, the panelists did not favor one approach over the other. The general consensus was that each approach had its own potential strengths and weaknesses and that results from both approaches merited attention.

The second panel, moderated by Dennis Carlton, dealt with estimation of price–concentration relationships. Carlton discussed what economic theory has to say about the price–concentration relationship and the potential problems in estimating and interpreting the relationship. He also emphasized the importance of sensitivity analyses to determine the possible effects upon estimation results, such as using different deflators, differing levels of data aggregation over time or space, or different lags in the response of gasoline prices to crude oil prices. The panelists generally agreed that possible endogeneity of price and concentration, potential poor measurement of the relevant market or market concentration, and limited data showing concentration changes may create serious estimation problems. Because of these issues and because factors other than mergers may affect concentration, the panelists generally agreed that studies of the effects of specific mergers were more likely than price–concentration studies to be informative for public policy.

The third panel, dedicated to robustness and measurement issues, was moderated by Halbert White. He characterized both the FTC and GAO studies as traditional dummy variable approaches, although differing in some respects. According to White, such traditional approaches can deliver useful results in identifying the competitive effects of a merger only under stringent

conditions. These stringent conditions require that a regression reflect a truly causal relationship, that relevant variables be included and be accurately measured, that the functional form must be correct, and that unwarranted restrictions (such as assuming that control variables have the same effect pre-and post-merger) not be imposed. According to White, if these conditions are violated, the traditional approaches may yield misleading estimates of the effect of a merger on prices; another consequence is that results may be very sensitive to the inclusion or omission of particular control variables.

White described an alternative econometric technique to identify merger price effects, a technique that he called the “treatments” approach (White, 2005). This technique requires a list of driving factors or determining variables that will inform the analysis about demand and cost shifters. Selection of these factors should be based on economic theory, and they should be measured accurately. Some variables in the analysis can be proxies for some truly unobservable variables. For example, prices in areas not affected by a merger might serve as a proxy for various demand and cost elements not directly observable. A key requirement for all included variables, which are referred to collectively as the “covariates”, is that they not be affected by the merger. A flexible specification of the covariates’ relationship to price is applied. This means that multiple types of relationships between an individual covariate and price (or joint relationships among covariates and price) are allowed in the model’s specification, including allowing a covariate’s relationship to price to differ before and after the merger. This model yields a predicted value of price without the merger: the effect of a merger is then the difference between this predicted price and what is actually observed post merger.

Compared to the traditional regression approach, White believed that the treatments approach is more likely to generate meaningful results about merger effects if data are imperfect or if the correct specification of the relationships among variables is not known. A disadvantage of the treatments approach is that, unlike the traditional approaches, consistent or meaningful estimates of non-merger variables’ impacts on price are not generated.

The final conference panel assessed the implications of the current learning for antitrust merger policy in the petroleum industry. This panel was co-moderated by Kenneth Hendricks and Scott Thompson. Hendricks remarked that neither the FTC nor GAO studies were very informative

about what is driving the apparent variability of measured impact across markets. He believed that it was important for policy reasons to establish the conditions in which a merger might be competitively problematic. He recommended additional research to determine what factors generate the apparent variation across markets by mergers, including the development of theoretical models that would assist in predicting whether a merger is going to have a big impact. Hendricks also urged caution in using the results of price–concentration regressions to inform merger policy because causality in these relationships is not clear and many of the assumptions in the price–concentration model are problematic in execution.

Thompson noted that identifying merger effects is not easy and reasonable people can disagree about what is the right answer. However, he stressed that it is important that the bedrock assumptions in any analysis be transparent since that facilitates discussion. It is also important that the bedrock assumptions be based on sound economics and that the analyst needs to have a good idea of which variables should be included in the analysis and which should be excluded. Thompson also said that adjustments for imperfections in the data such as autocorrelation need to be carefully done because the implicit assumptions underlying such adjustments may not be justified. Thompson said he had a hard time finding any strong lessons for public policy from the two studies. He agreed with Hendricks that the variability in outcomes in the two studies was distressing because this variability provided little guidance on whether the next prospective merger might be competitively problematic.

Hausman observed that there was a wide range of outcomes in the GAO study, despite HHIs presumably increasing in all the mergers evaluated. Accordingly, he concluded that HHIs should be abandoned as a guide in merger enforcement. An in-depth, competitive analysis in which each merger is studied uniquely is required since market conditions vary across mergers. Hausman believed that we did not have a good model of competition in markets such as petroleum, where, unlike some other industries, the product is fairly homogeneous and the possible anticompetitive problem is coordination by rival firms. In these situations, HHIs are not useful or predictive, according to Hausman.

White further explored the question of what individual merger studies might contribute to shaping public policy. He said that the treatments approach, although non-structural in nature

(and hence not informative about other market conditions that might be associated with merger effects), does provide a datum on the effects of a merger. White suggested building a database from the studies of individual mergers and, in a brick-by-brick approach, putting the data together so that the variability of outcomes might be understood. He also suggested building a database in which *ex ante* predictions are recorded and following up by reviewing what actually happened as a result of a merger. In this way, a better understanding of the accuracy of *ex ante* predictions, the variation in outcomes, and the factors that lead to precise predictions might be developed. White did not believe that merger policy should be changed just on the basis of any one study, and he shared Hausman's skepticism on the value of HHIs in guiding merger enforcement.

Carlton concluded that merger retrospectives are worthwhile, but there was little to learn from either the GAO or FTC study on how to assess mergers prospectively. He suggested that policy might be guided by testing models (either structural or reduced form) that sought to predict price prospectively and assessing which models are more accurate by comparing their predictions with *ex post* outcomes. Carlton would not change antitrust policy based on the GAO and FTC studies since a lot more progress needs to be made before he would be convinced by their findings. He agreed with other panelists that additional, more detailed studies of mergers on a market-by-market basis would be informative. While Carlton agreed with Hausman that HHIs are too simplistic as a guide to merger enforcement decisions, he noted that the antitrust agencies recognize this shortcoming.

In sum, the conference underscored the need for additional research to test the validity of the assumptions that underlie existing methodologies used to estimate merger price effects. There needs to be a better understanding of the reasons for differences in outcomes within a given methodology and across differing methodologies. New approaches may yield better answers to the difficult question of identifying the competitive effects of consummated mergers in the petroleum and other industries. BE staff is incorporating the learning from the conference in ongoing work concerning the estimation of the competitive effects of mergers.

4. THE ECONOMICS OF WHOLESALE PRICE ZONES IN GASOLINE

A March 2004 BE working paper by staff economists David Meyer and Jeffrey Fischer reviewed both pro-and anticompetitive explanations for two controversial vertical restraints commonly used in gasoline marketing: price zones and territorial restrictions (Meyer and Fischer, 2004). Price zones are areas where gasoline marketers charge common wholesale prices to their franchisees (often referred to as lessee dealers) who lease their retail outlets from the marketer, while territorial restrictions exist when gasoline marketers limit the areas in which their branded distributors (often referred to as branded jobbers) may operate. Price zones may be one part of a complicated relationship between gasoline marketers and their franchisees that facilitates efficient risk-sharing, provides optimal incentives for marketers and retailers, and allows marketers to react more quickly to changes in localized retail competition. Alternatively, if gasoline marketers have substantial market power, price zones may facilitate coordination or help deter entry. The paper concluded that territorial restrictions may prevent inefficiencies in distribution and reduce free-riding on investments that marketers make in developing networks of retail stations. At the same time, territorial restrictions help marketers maintain price zones (with the same welfare implications) and may facilitate coordination if marketers have substantial market power.

5. COLLUSION SCREEN APPLIED TO GASOLINE RETAILING

Developing data screens to detect anticompetitive conspiracies has been an elusive goal of competition agencies for many years. Conspiracies are difficult to detect because they take many forms. All conspiracies raise price above the competitive level, but data on the firms' costs, necessary to estimate the competitive price level, are rare. Consequently, use of the price level as a screen is limited to industries where the competitive level is known.

A working paper by FTC staff and coauthors presents a collusion screen based on the observed differences between a conspiracy and the period immediately following its collapse (Abrantes-Metz et al., 2005). Abrantes-Metz et al. first examined price variance before and after the collapse of a known bid-rigging conspiracy. The data were collected for a sentencing hearing following convictions of several defendants for rigging bids for frozen seafood sold to the Defense Personnel Support Center in Philadelphia. Their analysis focused on one of the items

involved in the conspiracy, frozen perch, for which there was a good measure of cost (the price of fresh perch). Following the collapse of the conspiracy, the average weekly price level *decreased* by 16%, while the standard deviation of price increased by 263%. The authors hypothesized that conspiracies in other industries would also exhibit low price variance, and they proposed a collusion screen based on the standard deviation of the price, divided by the mean (which is the coefficient of variation).¹⁵

Abrantes-Metz et al. applied the collusion screen to gasoline retailing in Louisville, Kentucky, over the period of 1996–2002. A cartel the size of Louisville might be very costly to organize and police, but there may be a degree of market power that could make elimination of localized competition profitable. Examining price variance at 263 retail locations, the authors searched for groups of neighboring stations that exhibit unusually small price variation, as measured by the standard deviation normalized by the mean. No such groups of stations were found. Instead, observed pricing differences across stations seem to have been driven more by proximity to major arteries and by brand characteristics rather than by pricing of neighboring stations.

6. MERGER RETROSPECTIVE: MAP'S ACQUISITION OF UDS GASOLINE MARKETING ASSETS IN MICHIGAN

In a new merger retrospective, staff economists John Simpson and Christopher Taylor examined effects on retail gasoline prices of the 1999 Marathon-Ashland Petroleum (MAP) acquisition of Ultramar Diamond Shamrock's (UDS) terminal, pipeline and gasoline marketing assets in the state of Michigan (Simpson and Taylor, 2005). This transaction proceeded without antitrust challenge. This transaction increased MAP's share of terminal storage in Michigan from about 18% to about 27% and increased the share of gasoline stations bearing a MAP brand from about 16% to about 24%.

A difference-in-differences model was used to compare price movements in six Michigan cities

¹⁵ There is some theoretical justification for a variance screen if it is costly to coordinate price changes, or if the cartel must solve an agency problem. To conceal the existence of a cartel from its customers, cartel members may only partially pass through cost changes. This partial pass-through lowers the variance of price relative to the variance that would obtain in a competitive market. Some theoretical papers predict that during conspiracies, price responds less to cost shocks under collusion, or that collusion reduces price variance.

(Flint, Lansing, Saginaw-Bay City, Grand Rapids-Muskegon, Jackson, and Kalamazoo-Battle Creek) affected by the acquisition with price movements in four nearby control cities (Chicago, Illinois; Gary, Indiana; South Bend, Indiana; and Elkhart-Goshen, Indiana) that were not affected by the acquisition. There were a number of industry events (such as the Wolverine pipeline break in the summer of 2000) that complicated the pricing comparisons.¹⁶ Using a model that controlled for periods of industry supply disruptions, the authors found no evidence that this acquisition led to higher retail gasoline prices. The paper also concluded that the sale in a related transaction of a closed UDS pipeline to Wolverine, and that pipeline's subsequent reconfiguration and integration with the Wolverine system, seemed to be associated with lower prices in Lansing relative to the control cities.

7. GASOLINE AND DIESEL PRICE MONITORING

In 2005 the FTC Gasoline and Diesel Price Monitoring Project entered its third year.¹⁷ The monitoring project tracks retail gasoline and diesel prices in approximately 360 cities nationwide and wholesale (terminal rack) prices in 20 major urban areas. Data are purchased from the Oil Price Information Service (OPIS), a private data collection company, and are received daily by FTC staff. Each week, an econometric model is used to determine whether current retail and wholesale prices in a given area are statistically "anomalous" when compared with predicted values based on historical price relationships across geographic areas and other variables.

As a complement to the analysis based on OPIS data, FTC staff also regularly review reports from the Department of Energy's Consumer Gasoline Price Hotline. Identification of prices that are significantly above the predictions of the econometric model or indications of suspiciously high prices based on other information, such as hotline tips, triggers further staff inquiry to determine the factors causing the price anomalies. When an anomalous price increase does not appear to be related to market-driven causes (such as refinery outages, pipeline outages, changes

¹⁶ Wolverine is an important supplier of refined products in Michigan, connecting the state with refineries and other major pipelines in Illinois and Indiana.

¹⁷ While diesel prices had previously been monitored on a seasonal basis, diesel prices are now monitored throughout the year on the same basis as gasoline prices.

in taxes, changes in fuel specifications, or changes in demand due to weather conditions), staff consults with experts at the Energy Information Administration. Staff also contacts the relevant state Attorney(s) General to discuss the anomaly and potential actions, including opening a law enforcement investigation.

The recent high level of crude oil prices have not contributed to an increase in the number of anomalous pricing episodes identified by FTC staff. During the first six months of 2005, with crude oil prices reaching over \$60 per barrel and the national average price of gasoline exceeding \$2.15 per gallon, there was only one case where regional gasoline prices were above the predicted level for a sustained period of time. This episode of anomalous pricing was due to a series of refinery problems. In comparison, during the first six months of 2004, with crude oil prices hovering around \$35 per barrel and the national average price of gasoline peaking at just over \$2 per gallon, there were about half a dozen sustained, anomalous pricing episodes across the country. Upon further examination, the causes of these episodes were refinery outages and maintenance problems, fuel transport problems, and a change in mandated fuel specifications.

8. RECENT ENFORCEMENT ACTIONS IN PETROLEUM

In addition to our reports and research on the petroleum industry, the FTC continued its antitrust review of mergers in the petroleum industry during the past year. We discuss below some of the enforcement actions taken in the recent past.

A. Chevron/Unocal. The FTC entered into a consent agreement that permitted Chevron's bid to acquire Unocal to proceed, subject to a consent agreement involving Unocal's patent portfolio relating to reformulated gasoline (RFG).¹⁸ Chevron is a major petroleum firm with both significant upstream and downstream assets in North America and in about 180 foreign countries. Unocal sold most of its downstream assets in the U.S. to another company in the 1990s and has no refining or gasoline marketing operations. Unocal's operations are, with few exceptions, in the upstream segment of the industry, with most of its oil and gas producing assets located in the Far East. Consequently, this proposed acquisition did not raise competitive concerns in either the

¹⁸ The FTC's complaint, consent agreement, and Analysis to Aid Public Comment for this matter are available at <http://www.ftc.gov/opa/2005/06/chevronunocal.htm>

bulk supply or marketing of refined products because there was no overlap. The proposed transaction did not raise competitive issues in crude oil exploration and production because Chevron and Unocal shares in any relevant crude oil market are *de minimis*.¹⁹

Unocal, however, owned patents covering the production of RFG with specifications that have been approved for sale by the California Air Resources Board (CARB RFG). Refiners must use the technology covered by the Unocal patents for producing CARB RFG. Chevron is a leading refiner and marketer of CARB RFG, and there are relatively few other producers of CARB RFG. Consequently, the FTC alleged that the refining and marketing of CARB RFG constituted relevant antitrust markets, which were either moderately or highly concentrated. Entry into these markets was alleged to be neither timely nor likely nor sufficient.

But how could Chevron's ability to exercise the market power inherent in the RFG patent portfolio be greater than that of Unocal?²⁰ The FTC alleged that Unocal was likely constrained in exercising its full market power in licensing the patents by possible actions by the California Air Resources Board or other governmental authorities. The FTC also noted that as part of its licensing agreements with refiners, Unocal regularly collected detailed reports from licensees on refinery production. By obtaining the patents, this information would come into Chevron's hands. The FTC alleged that this could facilitate coordination among refiners through better monitoring by Chevron of possible collusive agreements. The consent order addressed these competitive concerns in June 2005 by requiring Chevron and Unocal to cease enforcing the patents and to cease all attempts to collect damages, royalties, or other payments for use of the patents.

B. Valero/Kaneb. The proposed acquisition of Kaneb Services and Kaneb Pipe Line Partners by

¹⁹ For example, the FTC Petroleum Merger Report indicated Chevron had only 2.5% of world crude oil production in 2002, while Unocal's share in that year was about 0.2%.

²⁰ In 2003 the FTC issued an administrative complaint alleging that Unocal had illegally acquired monopoly power through its RFG patents by misrepresenting to the CARB that its research was non-proprietary and in the public domain at the time that regulatory standards for CARB gasoline were being determined. At the time of Chevron's proposed acquisition of Unocal, the Commission had overturned an administrative law judge's initial decision in favor of Unocal and had remanded the case to the ALJ for further hearings.

Valero L.P. in 2005 raised competitive issues in the bulk supply of refined petroleum products.²¹ Valero L.P. and the related Kaneb companies were operators of pipeline and product terminals in various parts of the U.S. Valero Energy is a major domestic refiner, and owned the general partner of Valero L.P., as well as many of the common units in Valero L.P. For purposes of antitrust analysis, the FTC treated the transaction as a merger of all the Kaneb and Valero entities.

In the Colorado area, Kaneb pipelines delivering product from third party refineries in Montana and Wyoming to Kaneb terminals in the Denver and Colorado Springs area competed with Valero pipeline and terminal assets serving the same area. The FTC alleged that the transaction would significantly increase concentration in the relevant antitrust markets and that entry into these markets was difficult, increasing the probability of collusion.

To address these competitive concerns, the FTC required divestiture of Kaneb's entire system of pipeline and terminal assets that served Colorado and nearby states. The FTC also required divestiture of a number of large Kaneb terminals for the storage of refined and other petroleum products and blendstocks in the Philadelphia and San Francisco Bay areas. Valero had a major refining presence in both geographic areas, and in both areas the Kaneb terminals were important points of access to the local market of products imported from refiners outside the area by tanker or barge, and in the case of Philadelphia, a major products pipeline. In both instances, the FTC alleged that the transaction would significantly increase concentration and that entry was difficult.

C. Shell/Magellan. In 2004, Magellan acquired a package of Midwest pipelines and product terminals from Shell, including Shell's product terminal in Oklahoma City, Oklahoma. The FTC alleged that Shell and Magellan had two of only a limited number of terminals serving the area. Even if another terminal located some distance from Oklahoma City was included in the relevant market, the merger of Shell and Magellan's Oklahoma City terminals would significantly increase concentration in the area. The FTC alleged that entry would be neither timely nor

²¹ The FTC's complaint, consent agreement, and Analysis to Aid Public Comment for this matter are available at <http://www.ftc.gov/opa/2005/06/valerokaneb.htm>

sufficient to prevent possible anticompetitive effects from the transaction. The FTC required divestiture of Shell's Oklahoma terminal assets to remedy these competitive concerns.²²

III. Arch Coal

In April 2004, the FTC sought a preliminary injunction to block Arch Coal's acquisition of the North Rochelle mine from Triton Coal. The U.S. district court denied the FTC's motion, and in June 2005 the FTC closed the investigation. This case raises issues concerning the standards of proof in merger challenges based on theories of coordinated interaction; the weight to be placed on customers' assessments of competitive effects; and the use of traditional structural measures such as number of competitors, market shares, and concentration indexes.

The Commission alleged that the relevant market in which to assess the competitive effects of this transaction was no larger than coal mined in the Southern Powder River Basin (SPRB) of Wyoming. With annual sales in excess of two billion dollars, SPRB coal is used to generate electricity in at least 26 states and accounts for about one third of U.S. coal consumption. Because of its low sulfur content and low cost, even a significant anticompetitive price increase would not cause a significant reduction in SPRB coal sales.²³

Prior to the acquisition, three large companies – Peabody, Kennecott, and Arch (the Big Three) – owned a large majority of SPRB mining capacity. Remaining capacity, including the North Rochelle mine, was owned by a fringe of companies with smaller market shares. The FTC's competitive theory was that, by transferring ownership of the North Rochelle mine from the fringe to a member of the Big Three, the acquisition would significantly reduce the supply elasticity of the fringe and increase the likelihood of tacit collusion to reduce Big Three output.

In assessing the effects of a merger on the likelihood of tacit collusion, economists evaluate whether firm, product, and market characteristics support a concern that sellers (or, in the present case, a subset of sellers) would be likely to reach a consensus on an anticompetitive scheme,

²² The FTC's complaint, consent agreement, and Analysis to Aid Public Comment on this matter are available at <http://www.ftc.gov/opa/2004/09/magellan.htm>

²³ The FTC's complaint on this matter is available at <http://www.ftc.gov/opa/2004/04/archcoalcomp.htm>

detect cheating, and punish deviations.²⁴ Other things equal, economists generally argue that tacit collusion is more likely in markets that are simple and transparent. For example, regarding simplicity, SPRB coal is homogeneous, or at least subject to standard adjustments for quality differences. Regarding transparency, there is a substantial amount of public data about coal markets, in part because of regulation of the railroad and electricity industries, and mine owners can observe much of what their competitors are doing. Also, Arch routinely made public statements indicating how it would like its competitors to behave.

It is, of course, important to establish that the merger would significantly increase the ability or incentive of sellers to collude. In the case of Arch's acquisition of North Rochelle, the FTC was able to point to the fact that the acquisition made Arch more similar to Peabody and Kennecott and, more importantly, that the acquisition increased the profitability of a coordinated reduction in output for all members of the Big Three.²⁵ The acquisition moved North Rochelle from the competitive fringe to the Big Three, thereby reducing the supply elasticity of coal from the fringe. The Commission argued that as a result, post-acquisition, a given reduction in output by the Big Three would be more profitable to each member of that group than would have been the case pre-acquisition.

The district court was persuaded that the relevant market in which to assess this acquisition was no larger than SPRB coal,²⁶ but the court was not persuaded on other points that were important to the competitive theory: (1) that the North Rochelle mine was competitively significant, (2) that there was a significant risk of tacit collusion in the market for SPRB coal,²⁷ or (3) that expansion of output by the remaining fringe mines would be insufficient to make an anticompetitive output reduction by the Big Three unprofitable. *Federal Trade Comm'n v. Arch Coal, Inc.*, 329 F. Supp.

²⁴ The classic paper for this approach to coordinated interaction is Stigler (1964).

²⁵ See <http://www.ftc.gov/os/2004/04/archcoalcmp.pdf>

²⁶ Complaint counsel attempted unsuccessfully to persuade the court that the relevant market was limited to one of two principal types of SPRB coal: 8800 BTU coal. Had the FTC prevailed on this point, the acquisition would have been a "4-to-3" merger in that market with no alteration in fringe firm incentives, so analysis would have proceeded as with any standard 4-to-3 coordination case.

²⁷ Complaint counsel attempted unsuccessfully to persuade the court that the Big Three had engaged in anticompetitive coordination in the recent past.

2d 109 (D.D.C. 2004).

It is noteworthy that the FTC's theory focused on the effect of the acquisition on the supply elasticity of the fringe and not its effects on the number of competitors, market shares, or concentration indexes. Those who were surprised that the FTC attempted to block a "5-to-5" merger²⁸ where the Herfindahl-Hirschman Index (HHI) and the increase in the HHI were lower than in most recent FTC merger cases where a complaint was voted out²⁹ likely did not focus on the supply elasticity issue.

Also of interest was the court's holding that customers' concerns that the transition would lessen competition were not persuasive. Numerous electric generating companies opposed the deal because of concerns that increased concentration would lead to higher SPRB coal prices. The court was unconvinced that these buyers provided anything more than an educated guess regarding the outcome of the merger. In closing the case, the FTC reiterated its position that the views of customers are important to the substantive analysis of the competitive effects of mergers. Consequently, the courts will likely need to consider the value of forward-looking, customer-based evidence in future cases. Objective information about the market obtained from customers is generally considered to be valuable. The debate centers around two points: (1) Are the opinions of sophisticated market participants about the outcome of a merger event valuable? and (2) How uniform must such customer opinion be to permit reliable inferences about merger effects?

IV. Estimating the Effects of Vertical Restraints

An under-appreciated area of economist activity at the FTC is the communication of ideas to our fellow economists and policy makers in other nations. While we discuss many areas of mutual interest, one topic that often rises to the top is vertical restraints.

²⁸ Triton Coal owned two SPRB mines: North Rochelle and Buckskin. North Rochelle produced relatively low sulfur, 8,800 BTU coal, while Buckskin produced relatively high sulfur, 8,400 BTU coal. In an all SPRB market, the transaction was 5-to-5 because Arch divested Buckskin to a company that was not previously in the market.

²⁹ The court reported that the acquisition increased the HHI based on loadout capacity from 2068 to 2292. The HHIs in previous FTC cases are analyzed in Coate and Ulrick (2005).

Since the 1977 *Sylvania* decision,³⁰ a successful antitrust plaintiff in U.S. courts must show that a challenged vertical restraint (e.g., exclusive dealing or exclusive territories) is likely to harm consumer welfare.³¹ A similar movement away from *per se* rules and towards effects-based rule-of-reason analysis is underway in Europe, where newly issued Block Exemptions to Article 81 do much the same thing.³²

To determine the effects of vertical restraints we can use inference based on either empirical or theoretical models. Economic theory tells us only that anticompetitive effects are possible under

³⁰ *In Cont'l T.V. Inc. v. GTE Sylvania Inc.*, 433 U.S. 36 (1977), the U.S. Supreme Court overruled *United States v. Schwinn*, 388 U.S. 365 (1967) and held that non-price vertical restrictions were to be judged under the rule of reason. Under the rule of reason, a plaintiff must show that the agreement is likely to have “genuine adverse effects on competition.” In support of its abandonment of *per se* treatment, the Supreme Court observed in *Sylvania* how exclusive territories had the potential to “induce competent and aggressive retailers to make the kind of investment of capital and labor that is often required in the distribution of products unknown to the consumer.” *GTE Sylvania, Inc.*, 433 U.S. at 55. A few years later, in *Monsanto Co. v. Spray-Rite Service Co.*, the Court again endorsed vertical restrictions that encourage retail service and supported a manufacturer’s right to terminate a discounting dealer to prevent free riding: “independent action is not proscribed. [A supplier] has a right to deal, or refuse to deal, with whomever it likes as long as it does so independently.” 465 U.S. 752, 760–761 (1984). See Muris (2001) for a discussion of the evolution of economics in antitrust jurisprudence.

³¹ Since 1977, Sherman § 1 cases involving vertical restraints – with the exception of explicit minimum resale price maintenance – are evaluated under the rule of reason. This standard requires a plaintiff to show that the agreement is likely to have “genuine adverse effects on competition.” *Federal Trade Comm’n v. Indiana Fed’n of Dentists*, 476 U.S. 447, 460 (1986). See also *Virgin Atl. Airways, Ltd v. British Airways PLC*, 257 F.3d 256, 264 (2d Cir. 2001) (plaintiff is required to show that the agreements in question “had an actual adverse effect on competition as a whole in the relevant market”); Areeda and Hovenkamp (2003, ¶1503a) (“Every antitrust suit should begin by identifying the ways in which a challenged restraint might possibly impair competition.”). Likewise, under Sherman § 2, the plaintiff must show that “a monopolist’s act ... [has] an ‘anticompetitive effect.’ That is, it must harm the competitive *process* and thereby harm consumers.” *U.S. v. Microsoft*, 253 F.3d 34, 58 (D.C. Cir. 2001). Based on his analysis of post-*Sylvania* case law, Ginsburg (1991) concluded that “non-monopolists have been effectively freed from antitrust regulation of vertical nonprice restraints.” Tying arrangements, though technically still *per se* illegal, are evaluated under a quasi rule of reason where the plaintiff has to show that the defendant has market power in the tying product and that the tie forecloses a “substantial amount of interstate commerce.” If a plaintiff cannot make this showing, the court analyzes the tying arrangement under the rule of reason. See *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2 (1984); *U.S. v. Microsoft*, 253 F.3d 34 (D.C. Cir. 2001).

³² Commission Regulation (EC) No. 2790/99 on the Application of Article 81(3) of the Treaty to Categories of Vertical Agreements and Concerted Practices, 1999 O.J. (L 336) (hereinafter “BER”); Guidelines on Vertical Restraints, 2000 O.J. (C 291) 1 (hereinafter “EU Vertical Guidelines”). For a discussion of the EU’s greater reliance on economics when analyzing vertical practices involving non-dominant firms, see Verouden (2003). Vertical agreements entered into by firms exceeding a 30% threshold (but below the 50 percent level required for “dominance”) are judged by their overall competitive effect, including an accounting of efficiencies. See EU Vertical Guidelines at ¶116.

a variety of strong – and difficult to verify – assumptions about (among other things) costs, demand, the nature of input contracts, conditions of entry, the slope of reaction functions, and the information available to firms. Theory does not tell us when anticompetitive outcomes are likely to appear. Put another way, economic theory has identified a number of avenues, or necessary conditions, by which vertical restraints could lead to anticompetitive outcomes, but it has not identified sufficient conditions under which anticompetitive outcomes would appear.

Translated into policy, necessary conditions delineate safe harbors, like “dominance” – whereby a firm must have significant market power in the primary market in order for vertical restraints to have an effect in a secondary market. But without sufficient conditions, policy makers lack guidance once they have left the safe harbors. This ambiguity has prevented the kind of convergence in enforcement standards that has occurred in horizontal mergers.

FTC economists are contributing to the policy debate by examining the empirical evidence on the effects of vertical restraints. The evidence comes mostly from so-called “natural experiments” comparing markets with and without restraints to determine the effect of the restraints. The term is something of a misnomer because there is nothing experimental about the results – rather the term is used to convey the idea that by comparing an “experimental” group of markets (with the restraint) to a control group of markets (without the restraint), we could learn something about the effect of the restraint. Designing these comparisons is subject to all of the usual econometric concerns about confounding factors and endogeneity.

What we found surprised us. The vast majority of the 24 empirical studies examining the effects of vertical restraints find them to be welfare-enhancing. For example, studies have found support for the proposition that vertical restraints and vertical integration serve mainly to better align the incentives of downstream retailers with those of upstream manufacturers. Specifically, the studies found evidence that vertical restraints eliminate the double-markup problem, and encourage retail investments in demand-enhancing activities.³³ In carrying out this survey, we

³³ See, e.g., Heide, Dutta, and Bergen (1998).

limited our review to those papers that address issues of explicit antitrust policy interest.³⁴

In the analysis that summarizes our findings, two features immediately stand out: First, there is a paucity of support for the proposition that vertical integration or vertical restraints are likely to harm consumers (Cooper et al., 2005). Of all the studies cited in that analysis, only one (Ford and Jackson, 1997, a study of vertical integration between cable television franchises and cable programmers) purports to find an unambiguously harmful effect of vertical integration. And in this instance, the losses are minuscule (\$0.60 per cable subscriber per year).³⁵ Second, a far greater number of studies found that the use of vertical restraints in the particular context studied improved welfare unambiguously (i.e., resulted in lower prices and larger quantities).

More specifically, the studies in Cooper et al.'s article appear to provide support for the proposition that vertical integration/vertical restraints often help solve double-markup problems, and/or reduce costs in other ways. These studies include:

- U.S. gasoline markets [Vita (2000); Barron and Umbeck (1984, 1985); and Shepard (1993) found that retail prices were lower when vertical integration was permitted].
- Retail beer sales through pubs in the UK [Slade (1998) found that the “beer orders” reducing vertical control of pubs resulted in higher retail beer prices].
- Cable television [Chipty (2001) found that the integration of cable TV programmers with distributors lowered retail prices].
- Fast food [Graddy (1997) found that prices are higher in franchised fast food restaurants as compared with company-owned stores].

Other studies bearing on the double-markup or other cost-savings issues analyze the competitive effects of vertical restraints in a broader cross-section of industries. For example, in her study of

³⁴ We do not discuss the extensive literature on contract choice in franchise relationships (see LaFontaine and Slade, 1997), nor do we discuss the literature (with one exception) that examines optimal contract/integration choice in the face of asset specificity (see, e.g., Joskow 1985).

³⁵ We note that Chipty (2001) found that vertical integration between cable systems and cable programmers resulted in lower prices to consumers.

litigated resale price maintenance (RPM) cases, Ippolito (1991) found that 30% of litigated resale price maintenance cases involved *maximum* RPM, strongly suggesting that in these instances vertical restraints were used as a means for constraining downstream market power.

The literature summarized in Cooper et al.'s study also provides at least indirect evidence that vertical restraints sometimes are used to induce the provision of demand-increasing activities by retailers.³⁶ Ippolito (1991) and Ippolito and Overstreet (1996) found that in their samples, the use of RPM generally was consistent with demand-increasing activities by retailers. Also consistent with this rationale for vertical restraints are Sass and Saurman's (1996) findings that the ban on exclusive territories in beer sales reduced beer consumption by 6%. Mullin and Mullin (1997) found vertical integration induced investment in relationship-specific assets in steel production; Hersch (1994) also concluded that his stock market event study provided evidence consistent with the efficiency rationale for RPM. Heide et al.'s (1998) study of exclusive dealing contracts found that a key determinant of the use of exclusive dealing contracts was whether manufacturers compensated dealers for services potentially 'free rideable' by rival manufacturers. Notably, Heide et al. found also that the perception by managers that entry likely was associated with a *reduced* probability that exclusive dealing contracts would be used, thus casting doubt upon the empirical importance of exclusionary motives for vertical restraints among the firms in their sample.

A few studies obtained results consistent with both pro-and anti-competitive characterizations of vertical restraints. Gilligan's event study (1986) obtained negative abnormal returns upstream when RPM contracts were challenged, a result consistent with efficiency and also manufacturer collusion explanations for RPM (because manufacturer profits would be expected to fall under either of these possibilities). In their study of cable television, Waterman and Weiss (1996) found

³⁶ That is, manufacturers might wish to induce their retailers to provide services to consumers that will increase demand for the product (e.g., showing consumers how to operate complicated electronic equipment). One problem is that these services may be subject to "free-riding;" that is, the customer goes to the full service retailer to learn about the product, and then proceeds to purchase the product from a no-frills discount retailer (this motive for vertical restraints was first articulated by Telser [1960]). Vertical restraints (such as minimum RPM) can be used to prevent this free-riding. More generally, vertical restraints can be used to provide incentives for the provision of any non-contractible service that enhances demand with or without service externalities among retailers (Mathewson and Winter, 1984).

that cable systems that owned pay movie channels were less likely to carry rival pay channels, a finding consistent both with pro-and anticompetitive behavior (a decision to integrate vertically into programming is presumptively profitable; the profits could arise either from greater efficiency [elimination of double-markups] or from foreclosure of some sort). Last, Hastings (2004) found that retail gasoline prices increased when ‘unbranded’ stations were acquired by a branded refiner. However, she concludes that the change in price at newly-acquired stations is attributable to the effects of “branding” formerly unbranded retailers, *not* to greater vertical control by refiners; indeed, she notes explicitly that her empirical evidence does not support “divorcement” restrictions (i.e., proscriptions on the vertical control of gasoline retailers by refiners).

Overall, we would characterize the empirical literature on vertical restraints/vertical integration as follows:

- Most studies find evidence that vertical restraints/vertical integration are pro-competitive.
- This efficiency often is plausibly attributable to the elimination of double-markups or other cost savings.
- A number of studies also find evidence consistent with “dealer services” efficiencies.
- Instances where vertical controls were unambiguously anticompetitive are difficult, but not impossible, to find.

We end with a call for more empirical work in this important area. The ambiguity of theory in this area underscores the necessity of more empirical work to inform policy. Given the importance of this issue, it is surprising that empirical evidence is so thin.

V. Conclusion

Economists at the FTC worked on a broad array of competition and consumer protection issues this year. This article reports on a selection of that antitrust work regarding: (1) the petroleum industry, (2) mergers, and (3) the evidence on the impact of vertical restraints. What conclusions might we draw from those particular efforts? In the gasoline market, we found that movements in

gasoline prices are well-explained in the long-run by the types of basic factors that would be expected – input costs, regulations, supply constraints, and short-run demand conditions. Anomalies in those prices are explainable and are short-lived.

On the merger front, in our recent coal merger case, the court questioned some of the basic notions behind coordinated effects cases, and looked skeptically at some of the standard sources of information that the government has traditionally used in building its cases. Government anti-trust enforcers will need to keep in mind the importance of providing adequate support for each of the premises underlying their cases.

In our efforts on vertical restraints, we found that the published academic literature on empirical effects is almost universally consistent with the argument that vertical restraints are efficient. Thus, there is not much empirical support for an animus toward vertical restraints. This also suggests that studies of vertical restraints would be unlikely to uncover unambiguous evidence that such restraints are anticompetitive.

Further work by economists on several of the issues discussed in this paper would be useful. The extent to which information from sophisticated customers is a reliable indication of merger effects; the effects of vertical restraints on welfare (and the often related issue of monopolization via such restraints); and the impact of mergers on price, output, and quality in particular industries including the oil industry would all be worthy topics for further study.

On the consumer protection front, both theory and evidence in the area of negative option marketing would be useful. This expanding market institution changes the normal defaults in transactions, and the effects of those changes are poorly understood.

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