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Price Dispersion and Class Certification in Antitrust Cases: An Economic Analysis

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Abstract *Differences in prices paid by putative class members (i.e., price dispersion) often become a focal point for class certification in antitrust matters. This paper discusses how an economic analysis of the existence, extent, and nature of price dispersion faced by plaintiffs seeking class certification may be informative even in matters thought to be particularly appropriate for class treatment (e.g., horizontal price-fixing). The existence of price variability among the products at issue can be addressed within the class framework if such price differences are systematic and able to be controlled for in any but-for pricing analysis.*

Introduction

A class action lawsuit provides a means whereby large numbers of plaintiffs may have their complaint involving common questions of fact adjudicated in a consolidated proceeding. However, before a class can be certified, certain *legal* conditions must be met.¹ Additionally, in antitrust cases, economic evidence often is at the heart of whether or not these conditions are satisfied. The authors' focus in this paper is to explore the *economic* evidence

¹In federal court, these are governed by Rule 23 of the Federal Rules of Civil Procedure. In general, for a class to be certified, the four prerequisites to Rule 23(a)(1)-(4) must be met (i.e., numerosity, commonality, typicality, and adequacy) as well as several additional requirements of Rule 23(b) (e.g., predominance and superiority). Most States have similar rules.

criteria, in particular pricing variability, and its relevance in helping to inform the class certification decision in an antitrust context.²

Generally, the central issue for an economist at the class certification stage is whether or not there is a common formula, model, or other methodology that plaintiffs could use to establish that each class member suffered impact and damages from the alleged anti-competitive act. Indeed, the class certification decision frequently depends on the quality of the expert analyses. As noted by Cook and Rugg (2006),

[A]ntitrust class certification decisions usually turn on which side has presented evidence that directly supports its class certification arguments rather than merely citing legal principles and case authority. ... Often the determination of whether [the plaintiff's expert] can truly deliver on a methodology to demonstrate antitrust impact through class-wide proof is the determining factor in a court's predominance decision.³

While price variability is but one economic factor relevant to the class certification decision, differences in prices paid by putative class members (i.e., price dispersion) often becomes a focal point for the economic analysis of class issues in antitrust matters. Typically, such price dispersion cases involve horizontal issues (e.g., price-fixing, bid-rigging) where class members argue that but-for the alleged anti-competitive conduct, plaintiffs would have paid lower prices. Such cases frequently are viewed by the courts as being particularly appropriate for class treatment because they presumably impact all direct purchasers in the affected market.⁴

As discussed in Nieberding and Cantor (2004), plaintiffs in these cases often base their arguments on case law stemming from

² This paper focuses on class actions that seek damages pursuant to Rule 23(b)(3) which holds that in order to successfully argue for class treatment, plaintiffs must establish that common issues are subject to generalized proof and predominate over individualized issues.

³Cook and Rugg (2006), at 4 and 8.

⁴See, e.g., *In re Plastic Cutlery Antitrust Litigation*, Civil Action Master File No. 96-CV-728 (E.D. Pa 1998), pp. 3-4. (“Class actions are widely-recognized as being particularly appropriate for the litigation of antitrust cases alleging a price-fixing conspiracy because price-fixing schemes presumably impact all purchasers in the affected market, so that common questions on the issue of liability predominate.”)

Bogosian v. Gulf Oil Corp. (1977).⁵ This case established the so-called “Bogosian shortcut” which favors a presumption of common impact on class members whenever economic reasoning provides a sensible link between the alleged unlawful conduct and common injury to individual class members. However, even in these matters, economic analysis is still required to ascertain whether average class-wide impact is a reasonable representation of that suffered by all members of the proposed class, or whether an individualized, plaintiff-specific assessment of impact and damages is more appropriate.⁶ Such a sentiment was endorsed by the U.S. Court of Appeals for the Third Circuit in *In re Linerboard Antitrust Litigation*,⁷ where the role of economic reasoning **and** sound economic analysis to support the appropriateness of class certification was highlighted.

In *Linerboard*, a matter in which the authors were involved,⁸ a key issue was whether an alleged conspiracy among linerboard producers would likely have had a common impact on direct purchasers who used this product to make corrugated sheet and boxes. Another issue was whether average prices in this industry were meaningful for pricing analysis as opposed to being too idiosyncratic and, hence, inappropriate for class treatment. The Third Circuit noted that the plaintiffs’ experts reliably demonstrated that certain product characteristics and economic conditions were present which led to a systematic pricing structure, providing them a basis for concluding that there existed a reliable formulaic approach to estimate damages for class members.

A strong argument can be made that the Bogosian concept of presumed impact was properly applied here. … In addition to relying on the Bogosian short cut, it [the district court] credited the testimony of plaintiffs’ experts, opinions that were supported by charts, studies and articles from

⁵*Bogosian v. Gulf Oil Corp.*, 561 F.2d 434 (3d Cir. 1977).

⁶Impact or injury can be common in that all class members are negatively affected by the alleged conduct (e.g., pay a higher price). While damages can be plaintiff-specific in a class action, they must be based on a common formulaic approach. See, e.g., *In re VisaCheck/MasterMoney Antitrust Litigation*, 280 F.3d 124 (2d Cir. 2001), at 139.

⁷*In re Linerboard Antitrust Litigation*, (MDL No. 1261), filed September 5, 2002 (Third Circuit).

⁸Dr. Cantor served as the expert economist on class certification for the corrugated sheet plaintiffs. Dr. Nieberding assisted with the preparation of the expert report.

leading trade publications. These experts suggested that advanced econometric models could be effectively prepared to establish class-wide impact.⁹

The class action trade press, in commenting on the Supreme Court's refusal to review the Third Circuit's decision in *Linerboard*, noted

In addition to the “*Bogosian* shortcut” of presumed impact, the panel noted, the plaintiffs’ case for showing class-wide injury was bolstered by two expert witnesses who backed up their professional opinions with supporting data.¹⁰

The authors believe that the Third Circuit’s decision in *Linerboard* affirms the role of proper economic analysis to either support or refute the appropriateness of class treatment in cases that invoke the *Bogosian* shortcut of presumed impact. Arguments that invoked *Bogosian* without such supporting analyses were unconvincing to the court as seen in *Weisfeld* (upholding a district court’s decision denying Weisfeld’s motion for class certification).¹¹

Contrary to the support presented by the plaintiffs’ experts in *In re Linerboard*, the District Court found telling that Weisfeld’s expert provided only “naked conclusions” that common proof would demonstrate injury to class members. … We found it significant, however, that those experts [in *Linerboard*] engaged in “extensive empirical investigation” and economic analysis. Further, the experts [in *Linerboard*] “effectively utilized supporting data, including charts and exhibits, to authenticate their professional opinions.” The *In re Linerboard* plaintiffs, therefore, did not rely “solely on presumed impact and damages” and adequately demonstrated “that they could establish [antitrust] injury on a class-wide basis.” (Citations omitted)

⁹*In re Linerboard Antitrust Litigation*, (MDL No. 1261) filed September 5, 2002 (Third Circuit), at 13-14.

¹⁰“Supreme Court Rejects Plea for Review of Class Certification Ruling,” *Class Action Litigation Reporter*, Volume 10, Issue 5, June 2003, at 10.

¹¹*Weisfeld v. Sun Chem. Corp.*, 210 F.R.D. 136, 143-44 (D.N.J. 2002), *aff’d* (3d Cir. 2004).

The standard articulated in *Linerboard* has appeared in recent decisions. For example, in *American Seed v. Monsanto*, the court denied class certification because the plaintiff's economist's opinion lacked the type of analyses accepted by the Third Circuit.¹²

The court finds that this suit lacks the factual support that existed in other cases upholding class certification based on the *Bogosian* short-cut presumption of impact ... [the plaintiff's expert economist] "has not supported his theory of presumed impact with any supporting documentation" ... [and his] "submissions are not 'supported by charts, studies, and articles from leading trade publications' as in *In re Linerboard*, 305 F.3d at 153."¹³

And, as argued by Cook and Rugg (2006),

[C]lass certification should not be automatic in price fixing litigation. It must be based upon common evidence of a violation and antitrust impact, and upon developed expert testimony adapted to the particular industry. Most of all, both parties must submit actual evidence rather than mere legal arguments.¹⁴

Notably, with respect to the topic central to this paper, the court pointed out that the plaintiff's economist in *American Seed v. Monsanto* "did not study the pricing and/or pricing variability for any of the varieties of GM corn seeds."¹⁵

One other issue to consider is the relevance of *Daubert* and its progeny – which govern the admissibility of expert testimony –

¹²*American Seed Co., Inc. v. Monsanto Co.*, D. Del., Civ. No. 05-535-SLR, (November 13, 2006).

¹³"Monsanto Defeats Class Certification in Corn Seed Monopolization Suit," *Antitrust and Trade Regulation Report*, BNA, Inc., Volume 91, No. 2282 (December 8, 2006), at 604.

¹⁴Cook and Rugg (2006), at 13.

¹⁵"Monsanto Defeats Class Certification in Corn Seed Monopolization Suit," at 604.

at the class certification stage.¹⁶ While a detailed discussion of the topic is not the focus of this paper, the authors do note that such challenges have been initiated against expert testimony submitted in class proceeding.¹⁷ As noted by The U.S. Court of Appeals (2nd Circuit),

We note that a motion to strike expert evidence pursuant to *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), involves a inquiry distinct from that for evaluating expert evidence in support of a motion for class certification. ... although the parties' substantive arguments in both instances may be similar, as is true in this case. A *Daubert* motion is typically not made until later stages in litigation, such as in association with a motion for summary judgment, motion *in limine*, or at trial, and a district court should not postpone consideration of a motion for class certification for the sake of waiting until a *Daubert* examination is appropriate.¹⁸

While courts may be reluctant to apply *Daubert* before admitting expert testimony during class certification, some commentators have argued that an increased use of *Daubert* is warranted at this stage of litigation (Burch 2004).

Price Dispersion and Class Certification

At the class-certification stage, the expert is asked to assess whether the alleged conduct, impact, and damage for each proposed class member can be made through common or formulaic means that are based on well-accepted empirical methods, and can be applied for the purposes of computing damages for the plaintiffs on a class-wide basis. If there are issues relating to each class member that must be analyzed individually, or if each class member's

¹⁶Three Supreme Court decisions beginning with *Daubert* have imposed strict standards on acceptable expert testimony (*Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993); *Gen. Elec. Co. v. Joiner*, 522 U.S. 136 (1997); and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1997)).

¹⁷See, e.g., *In re Visa Check/MasterMoney Antitrust Litig.*, 192 F.R.D. 68 (E.D.N.Y. 2000).

¹⁸*Wal-Mart Stores, Inc. v. Visa U.S.A., Inc. (In re Visa Check/MasterMoney Antitrust Litig.)*, 280 F.3d 124 (2d Cir. 2001), at 7.

transactions must be examined separately to determine impact or damages, then a common formulaic methodology will not reasonably or reliably establish class-wide impact or damages.

Defendants frequently argue that individual, idiosyncratic pricing strategies result in price variability that render a generalized assessment of impact and damages unreliable if not impossible. Other types of “variability” may include differences in methods of distribution, product differentiation, varied promotions offered by defendants to different customers or at different times, and varied participation in such promotions by class members. Plaintiffs, on the other hand, generally argue that such price variability will not preclude class certification because price differences are due to observable, measurable factors and, therefore, are systematic and able to be controlled for in any but-for pricing analysis. As a result, the pricing structure often becomes a major point of contention at the class certification stage. For example, how changes in list prices impact transaction prices paid by class members, in particular the existence and extent of price dispersion, can be hotly contested.

Impact on direct purchasers in an antitrust case can be shown by common proof of a price conspiracy (usually left to the lawyers), and but-for prices can be established for the conspiracy period at some non-conspiracy benchmark (usually left to the economists). The economist’s task can be accomplished by using proper statistical methods or other quantitative techniques that properly control for variation among plaintiffs should they exist.¹⁹ However, an analysis of price dispersion at the class certification stage should not be confused with “damages issues” such as the estimation of but-for prices.²⁰ The former type of price analysis is the subject of this paper. Nieberding (2006) provides a detailed treatment of the latter type of price analysis.

¹⁹See, e.g., Page (1999), at 11-12:

Price-fixing cases often involve complexities associated with regional variation in competitive conditions, heterogeneities of products and prices, variations in buying power of purchasers, and so forth. These factors necessarily raise individual issues of damages and impact, and may bar certification if the plaintiff’s proposed theory fails to account for them. But courts have accepted statistical techniques to isolate the impact of the overcharge as sufficient for certification. [footnotes omitted]

²⁰See, e.g., *In re Polypropylene Carpet Antitrust Litigation*, 178 FRD 603, 618 (ND Ga, 1997) (“[A]t the class certification stage, Plaintiffs must show that antitrust impact can be proven with common evidence on a classwide basis; Plaintiffs need not show antitrust impact in fact occurred on a classwide basis.”).

A discussion of price dispersion and its implications concerning class treatment can be found in instances where courts have certified a class, denied class certification, certified only a sub-class of the original class, or have deemed credible yet conflicting expert testimony on class issues to be more appropriate for consideration by the trier-of-fact than the court. For example, in instances where courts have certified a class, they had this to say concerning price variability:

Neither a variety of prices nor negotiated prices is an impediment to class certification if it appears that plaintiffs may be able to prove at trial that, as here, the price range was affected generally.²¹

Great Lakes argues that the varying prices and the diverse supply and demand factors affecting five different bromine compounds and their derivatives and blends preclude generalized proof of impact on a class of plaintiffs. ... This argument fails, however ... A wide range of products and prices does not make it impossible to use common proof to demonstrate impact.²²

Additionally, differences such as pricing methods, prices paid by purchasers, end users, price changes in product lines and variation in methods of purchase are not enough to show a predominance of individual questions.²³

In other instances, courts have found that price variation was too idiosyncratic and that class treatment would be less reliable than a more individualized investigation.

The typicality requirement can be met in an antitrust case even though there are many products sold at varied prices and conditions. ... [however] The Court finds that proof of injury is an individual

²¹ *In re NASDAQ Market-Makers Antitrust Litigation*, 169 F.R.D. 523 (S.D.N.Y. 1996).

²² *In re Bromine Antitrust Litigation*, 203 F.R.D. 26-27 (S.D. Ind. 2001).

²³ Judge's decision supporting Class Certification and denying Summary Judgment in *Erie Forge v. Cyprus Minerals Co.* (W.D. Pa.) 19 (July 27, 1995).

matter that varies by customer, by transaction, and by products purchased. ... Prices for the various sizes and flavors of product varied from day to day, from customer to customer, with essentially comparable customers on occasion paying different prices on the same day for the same product.²⁴

In these different markets, defendants price nuts in different ways. ... Grouping purchasers in all of these sub-markets together ignores the crucial difference in how defendants set prices for different purchasers. Given the diversity of markets, it can hardly be said that common issues predominate.²⁵

List prices differed [from] variety to variety, and sometimes differed from region to region for a single variety. ... farmers buying GM seeds often received varying discounts from the list prices, so each farmer would have to prove separately that he paid an actual transaction price that was supra-competitive; ... The wide variation in list prices among hybrids and the pricing of some GM hybrids with zero or negligible list price premiums, as compared with corresponding non-GM hybrids, would require the purchasers of some hybrids to prove injury through evidence that would vary according to individualized market conditions.... .²⁶

Yet, in other instances, courts have used the issue of price dispersion to assist in re-defining a class that is then allowed to proceed with litigation:

[W]e are persuaded that despite the wide range of products and prices involved, common proof of impact is possible on behalf of purchasers who bought list-price products. Common proof is not possible, however, on behalf of purchasers who

²⁴*Butt v. Allegheny Pepsi-Cola Bottling Co.*, 116 F.R.D. 488, 491, 493 (ED Va 1987).

²⁵*Burkhalter Travel Agency v. MacFarms Int'l., Inc.*, 141 F.R.D. 154 (N.D. Cal. 1991).

²⁶*McIntosh v. Monsanto Co.* (E.D. Mo.), Case No 03-3993 (March 7, 2005), at 12-14.

bought non-list price products. ... The testimony of plaintiffs' expert economist provides some support for the proposition that individual negotiations for discounts, credits and rebates were based, at least in part, on applicable list prices.²⁷

And, in some instances where courts have been confronted with conflicting evidence based upon expert testimony, classes have been certified with such evidence left to the trier-of-fact:

Defendants argue that the variety of prices paid and volumes purchased by the proposed class will predominate over any class-wide proof of a relationship between defendant's alleged price-fixing conspiracy and the prices paid by plaintiffs. ... However, [plaintiffs' expert] finds the defendants' prices behaved similarly over time ... [while defendants' expert] persuasively shows that based on individualized transaction data, pricing to audiotape buyers was on an individualized basis, and that this approach to pricing can be seen to apply across products, different volume purchasers, and time periods.²⁸

Here, the court said that "numerous courts in antitrust actions have found that this 'battle of the experts' is properly evaluated by the jury, not the Court" which "the Court cannot consider in deciding a class certification motion."²⁹

In situations involving vertical relationships where the class consists of indirect purchasers (in those States that allow antitrust standing for such plaintiffs), a study of the effect on consumer prices of, say, a vertical restraint usually requires a more complex assessment *vis-à-vis* conduct involving horizontal issues. Such matters may involve a detailed study of prices throughout the entire distribution chain, perhaps with numerous intervening levels, that precedes an end-user and potential class member of the product in question. Therefore, the "commonality" and/or "predominance" analysis is substantially confounded when class members are

²⁷ *In re Industrial Diamonds Antitrust Litigation*, 167 F.R.D. 383 (S.D.N.Y. 1996).

²⁸ *In re Magnetic Audiotape Antitrust Litigation*, 2001 U.S. Dist. LEXIS 7303, 14, 19 (S.D.N.Y. June 6, 2001).

²⁹ *Id.* at 15, 21.

indirect purchasers, in large part because there are numerous intervening market transactions that determine what impact, if any, reaches a particular indirect purchaser. Hussain, Garrett, and Howell (2001) find that courts may be more apt to rule against class certification (or call for a more narrow class definition) in such cases.

One factor that makes for the difficulty in indirect purchaser cases is the issue of “pass-through” or “pass-on.” In general, this difficulty addresses the extent (if any) that direct purchasers from defendants pass on overcharges to their direct customers who, in turn, sell to another set of customers, and so on, down the distribution chain until the indirect purchasers at issue are reached. Issues of pass-through must be analyzed at each level of distribution. A further complicating factor may be that at each level of this chain, there may be a different market structure with different implications for pass-through.

The issue of pass-on and its implications for class certification in indirect purchaser lawsuits can be found in instances when classes have, and have not, been certified. For example, as noted by the State of Michigan’s Court of Appeals (in reversing a class-certification decision by a trial court),

[W]hen proving pass-on, plaintiffs typically must present evidence in the form of economic theory and analysis ... [which] are most useful, and therefore come closest to satisfying the actual damages and common proof requirements for pass-on, when there are a minimum of variables involved. ... One defense expert’s study confirmed this premise from *Wood*, suggesting that the pass-on rates not only varied widely for Microsoft’s products, but were sensitive to the price points used to market them. Even if the relevant market is perfectly competitive and results in one hundred percent pass-on of the overcharge, which another defense expert disputes, the plaintiffs’ expert’s affidavits fail to assure us that the methodologies he has proposed can account or adjust for this breadth of remaining variation for the class.³⁰

³⁰*A & M Supply v. Microsoft Corp.*, 252 Mich. Ct. of Appeals, opinion filed August 27, 2002, at 27, 29, and 34.

However, when confronted with the same issues about the appropriateness of class certification including pass-on considerations, the South Dakota Supreme Court (among several other States) sustained the class certification of indirect purchasers suing Microsoft Corp.³¹

An Empirical Test

As an example of one technique used to investigate price variability in the context of class certification, consider an indirect purchaser case where manufacturers who distribute their product through wholesalers are being sued (in State court) for anti-competitive actions which allegedly led to higher prices.³²

Assume the class of indirect purchasers consists of those consumers who purchased from the wholesalers, and that the critical issue is whether or not the pass-through of manufacturers' price increases to plaintiffs is uniform. One technique to test this hypothesis involves analysis of the transactions databases of the wholesalers with indirect purchasers using a standard method of analysis, a fixed-effects panel data model. This specification allows one to test directly for the presence of different pass-through rates for individual plaintiffs. Results indicating that there are statistically significant individualized influences on measured pass-through rates would be consistent with there being differences in the degree of pass-through to different indirect purchasers. Hence, any attempt to make the pass-through effect common to all plaintiffs will lead to less reliable results, with some plaintiffs receiving substantial windfall gains or losses. Moreover, class certification would likely fail in such a case because each wholesaler's transactions database would need to be analyzed in order to determine the varied pass-throughs to class members. Such an exercise likely would stretch the bounds of manageability.

A panel data set is one in which observations are collected on identified units (or "cross sections" or "panels") over a period of time. To understand how a fixed-effects model accounts for the influence of individual factors, consider the simple regression model:

³¹*In re* South Dakota Microsoft Antitrust Litigation, S.D., 2003 SD 19, opinion filed February 12, 2003.

³²For confidentiality reasons, use of the actual data or identifying the matter involved is not possible. However, the authors believe the example used is sufficient for the purposes of this article.

$$Y_{it} = \alpha_i + \beta_i X_{it} + \mu_{it} . \quad (1)$$

Here, the dependent variable Y (price increase to indirect purchaser) and the independent variable X (manufacturer's price increase) are observed for numerous indirect purchasers (denoted by the subscript "i") for a given wholesaler over several periods of time (denoted by the subscript "t"). The fixed-effects model allows individual effects to explain variation in the dependent variable through the regression intercept term (α_i) and the pass-through effect (β_i). That is, the intercept term and the pass-through rates are plaintiff-specific; they remain constant over time for a given purchaser but are allowed to vary across purchasers. In contrast, if the intercepts and pass-through rates are the same across plaintiffs, then equation (1) can be written

$$Y_{it} = \alpha + \beta X_{it} + \mu_{it} \quad (2)$$

where the intercept term (α) and the pass-through effect (β) are assumed to be common to all plaintiffs and to not vary across plaintiffs. If equation (2) is a sufficient specification for the regression model, individual characteristics do not contribute significant explanation to variation in the dependent variable. Consequently, all individual effects can be captured through a common intercept term and a common pass-through rate.

The statistical test regarding the importance of individual factors in explaining variations in the dependent variable is an F-test of whether equation (1) or (2) is a sufficient model to explain the data. If F-test results indicate that there are statistically significant individualized influences on measured pass-through rates (i.e., the more appropriate model is equation (1)), then this is consistent with there being differences in the degree of pass-through to different indirect purchasers. Accordingly, this (together with other information) would support rejecting the class if plaintiffs argued for common pass through.

The Implication of Price Dispersion for Class Certification

The law-of-one price is a tenet of theoretical economics which states that in competitive markets comprised of many buyers and sellers, identical goods and services ought to sell in a given market at identical prices at a given point in time under conditions

of product homogeneity, zero transaction costs, zero search costs, no informational asymmetries, and no market imperfections.

Indeed, in the economists' paradigm of perfect competition which embodies these assumptions, all sellers and buyers are price-takers at a single, prevailing market equilibrium price. For economists, the analysis of class certification as it pertains to price dispersion may be viewed as an empirical test of whether or not the law-of-one price holds in a particular context for a given set of plaintiffs, after properly accounting for observable factors that systematically influence pricing. Clearly, if this law-of-one price holds, then this would be statistical evidence in support of class certification.

However, when the law-of-one price does not hold a class still might be certified. That is, a certifiable class might exist in the presence of price dispersion if price differences are due to systematic factors that are able to be controlled for in any but-for pricing analysis.

If price dispersion still exists after controlling for all reasonable influences that may explain observed price differences, then the law-of-one price is violated. Despite its intuitive appeal, the existence of price dispersion (which belies the law-of-one price) has been well-documented in the economics literature even for items thought to largely conform to the law-of-one price (Liu and Serfes 2005; Anderson and Palma 2003). Indeed, in a seminal paper, Stigler (1961) noted the prevalence of price dispersion in a variety of industries with seemingly homogeneous goods, a finding confirmed in more recent research (Pratt, Wise, and Zeckhauser 1979; Abbott 1994), while Lach (2002) finds that "price dispersion prevails even after controlling for observed and unobserved product heterogeneity" in his study of four homogeneous products. Even with the internet where it is thought that search costs are low compared to conventional markets, studies of internet pricing find persistent price dispersion and scant support for the phenomenon that prices on the Internet are conforming to the law-of-one price (Baye, Morgan, and Scholten 2004; Bayliss and Perloff 2002; Pan, Ratchford, and Shankar 2002).

The existence of improperly defined markets, regional/local market power, non-trivial transaction/search costs, informational asymmetries, capacity constraints, and equilibrium randomization of prices by firms, all have been cited as reasons for empirically observed price dispersion. Theoretical models of price dispersion often focus on search costs of buyers and/or capacity constraints and demand uncertainty facing firms, and how this can lead to price dispersion occurring in equilibrium (Arnold 2000; Dana 1999;

Salop and Stiglitz 1977).

Some of these factors, for example market power, might be the very reason class certification is being sought. However, this article will consider the case of how positive and significant search can result in equilibrium price dispersion.

In the absence of such search costs, buyers would have full information about prices (or could become fully informed costlessly) and likely would seek out the lowest price, guaranteeing that this would be the only one price to prevail in equilibrium. However, with positive search costs, those buyers who engage in searching in order to determine the true distribution of available prices become “informed” *vis-à-vis* those buyers who remain “uninformed.” This informational asymmetry may cause markets not to obey the law-of-one price.

Indeed, it has been shown that firms with market power can exploit such market imperfections and find it profitable to engage in strategies of “equilibrium price dispersion” with respect to buyers. That is, firms recognize that consumer search costs present an opportunity to extract “rents” so that in equilibria there exists a distribution of prices resulting in persistent price dispersion in which sellers charge different prices for the same good/service.

The following simple “search cost” model, while generating price dispersion in equilibrium, illustrates that non-trivial search costs and rent extraction need not defeat class certification.³³

Assume a continuum of consumers of two types: those who search for the lowest price for a given product and those who do not. All consumers are indexed by the search cost “*s*” on the interval [L, H] where those with relatively high search costs (perhaps due to high opportunity costs of their time) are close to H (for high) and those with low search costs lie closer to L (for low). Suppose there are two stores selling a single product and that both stores face the same cost of acquiring and marketing this product. A Discount store (“D”) charging price P_d , and an Upscale store (“U”) charging price P_u are the two stores. For simplicity, assume all costs to be zero and that

$$P_u > P_d \quad (3)$$

(this will be shown to exist in equilibrium). The average price faced by a shopper who does not search but, with equal probability,

³³More complicated search cost models can be found in the industrial organization literature (e.g., Shy 1995: 421-426).

shops at either D or U is

$$\hat{P} = (P_d + P_u)/2. \quad (4)$$

Consumers, unless they conduct a search while knowing this average price, do not know which store is type D or U.

If a consumer searches for the lowest price, he will find D and pay price

$$P_d + \alpha \cdot s \quad (5)$$

where α represents the effort or preference for searching which likely varies by consumer. If a consumer does not search and shops randomly, he will pay price \hat{P} . Therefore, a consumer will search for the lowest price if the consumer perceives

$$\hat{P} > (P_d + \alpha \cdot s) \quad (6)$$

and not search if the consumer does not perceive

$$\hat{P} < (P_d + \alpha \cdot s). \quad (7)$$

A consumer will be indifferent between searching and not searching if

$$\frac{P_d + P_u}{2} = (P_d + \alpha \cdot s) \quad (8)$$

or, solving for the optimal search cost, \hat{s} , using equation (8) yields,

$$\hat{s} = \frac{P_u - P_d}{2\alpha}. \quad (9)$$

Assume that

$$H > \hat{s} > L > 0. \quad (10)$$

Given this setup, the expected demand facing the discount store D will be

$$ED_d = \hat{s} - L + \left(\frac{H - \hat{s}}{2} \right). \quad (11)$$

Here, $(\hat{s} - L)$ represents those consumers who find it in their best interest to search and buy at D; $\left(\frac{H - \hat{s}}{2} \right)$ represents those consumers who do not search but shop randomly and end up at store D. Using equation (9), equation (11) can be written as

$$ED_d = \frac{H}{2} - L + \frac{P_u - P_d}{4\alpha}. \quad (12)$$

Therefore, recalling that all costs were assumed to be zero, store D's expected profit ($E\pi_d$) is $P_d \cdot ED_d$, or (using equation (12))

$$E\pi_d = P_d \cdot \left(\frac{H}{2} - L + \frac{P_u - P_d}{4\alpha} \right) \quad (13)$$

In deciding its optimal price, P_d^* , D takes the price of its competitor (P_u) as given, and selects its price to maximize expected profits as given in equation (13).³⁴ From D's first-order condition,³⁵ it can be shown,

$$P_d^* = \alpha(H - 2L) + \frac{P_u}{2} \quad (14)$$

which represents D's “best response function” to the price charged by U, P_u .

³⁴In the jargon of industrial organization economics, D and U are competing according to a static Bertrand non-cooperative model of oligopoly in which price (as opposed to output) is the strategic variable.

³⁵In optimization problems, a first-order condition is the first derivative of the objective function (here, D's expected profit function) with respect to the choice variable (here, D's price). First-order conditions equal to zero are necessary (but not sufficient) for the optimal value of the choice variable to be a relative maximum or minimum. Specifically, D's first-order condition is

$$\frac{\partial(E\pi_d)}{\partial P_d} = \left(\frac{H}{2} - L + \frac{P_u - P_d}{4\alpha} \right) - \frac{P_d}{4\alpha} = 0$$
 which, when solved for P_d^* , yields equation (14).

The analysis with respect to U is similar to that for D. Namely, U's expected profit ($E\pi_u$) is $P_u \cdot ED_u$, where U's expected demand represents those who randomly shop (as opposed to search) and end up at U. Using equation (9), U's expected profit is

$$ED_u = \frac{H - \hat{s}}{2} \quad (15)$$

$$E\pi_u = P_u \cdot \left(\frac{H}{2} - \frac{P_u - P_d}{4\alpha} \right). \quad (16)$$

In deciding its optimal price, P_u^* , U takes the price of its competitor (P_d) as given, and selects its price to maximize expected profits as given in equation (16). From U's first-order condition,³⁶ it can be shown that

$$P_u^* = \alpha H + \frac{P_d}{2} \quad (17)$$

which represents U's “best response function” to the price charged by D (P_d). Equilibrium prices are found by simultaneously solving equations (14) and (17) for P_d^* and P_u^* . Doing so yields

$$P_d^* = \frac{2}{3}\alpha(3H - 4L) \quad (18)$$

and

$$P_u^* = \frac{2}{3}\alpha(3H - 2L). \quad (19)$$

³⁶S's first-order condition is $\frac{\partial(E\pi_u)}{\partial P_u} = \left(\frac{H}{2} - \frac{P_u - P_d}{4\alpha} \right) - \frac{P_u}{4\alpha} = 0$ which, when solved for P_u , yields equation (17).

Equations 18 and 19 show that in equilibrium there is price dispersion, namely, $P_u^* > P_d^*$.³⁷ That is, the discount store will charge a lower equilibrium price (P_d^*) for the same product than the upscale store (P_u^*).

The existence of price dispersion by itself, however, need not weaken the appropriateness of class certification if price differences are due to observable, measurable factors and are systematic and able to be controlled for in any pricing analysis. In the above situation, to the extent that one can properly control for “store type” in a statistical analysis of pricing, such price variability or dispersion does not represent the kind of idiosyncratic pricing strategies that make generalized assessment of impact and damages unreliable in a class setting.

Conclusion

Whether or not impact can be proven on a common basis depends upon the facts and circumstances of each case. The authors conclude that price variation is not a sufficient condition to defeat common-impact arguments necessary for class certification. It is argued that an economic study of the existence, extent, and nature of price variability frequently is applicable in the class certification decision in antitrust matters where economic evidence may be critical in finding whether or not one size fits all.

The existence of price dispersion can be addressed within the class framework if there are systematic price adjustments for these differences. Situations such as differences in prices among long-term contracts (e.g., each contract varies according to non-price factors such as credit terms), among geographic areas (e.g., the commodity at issue is traded on a national basis but regional price differences exist), among purchases by large and small buyers (e.g., the existence of volume discounts), or among contract and spot sales (even though all prices are based upon a national price index), need not hinder the appropriateness of class

³⁷ To see this, note that from equations 18 and 19, $P_s^* - P_d^* = \frac{4}{3}(\alpha L) > 0$.

Also, note that an increase in the cost or effort associated with searching (α) serves to increase the spread between the two equilibrium prices, while a decrease in α causes both prices to become more competitive in that they converge toward cost (zero in this case).

treatment if such differences are systematic and reasonably can be controlled for in any but-for analysis.

In other instances, however, price variation among class members may be due to idiosyncratic influences making a generalized assessment of impact and damages unreliable and less appropriate than plaintiff-specific analysis. For example, if pass-through behavior varies substantially and idiosyncratically with respect to how it affects the prices paid by putative class members, then calculations of impact and damages will be less reliable if treated as a class than if done individually.

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Editor's Note

Each issue of a journal presents its own challenges and learning opportunities. Any attentive editor always will be humbled by the generosity of others and the aid they provide to that journal. A host of folks are owed a hearty thank you. Alas, this short space could not accommodate so long a list. Thus, this general "Thank you!" will need to suffice for the authors, the reviewers, the *JLE* Board of Editors, the AAEFE Board of Directors, and the cheerful assistance of the editorial staff.

JLE v14i2 offers up to the reader four distinctive views of universal problems confronting forensic economics; albeit each article is cloaked in the garb of a distinctive branch of forensic economics. First, Rosenbaum and Guthmann gaze into the future, while standing in the past, only to find a dimly defined forecasting horizon. Next, Dawson grapples with how to assess value that springs from access to a resource. Then, Nieberding and Cantor seek to define the boundaries of the market and its participants. Lastly, McCollister and Pflaum challenge an assumption standard to all statistical analysis. The *Journal* hopes you will find each as enjoyable a read as each is an informative read.

I would be remiss if I did not, in some manner, note the trials and tribulations besetting AAEFE and the *JLE* over the last year and a half. As tempting as it might have been to be disheartened by the behavior of some, without fail the courage, steadfastness, and cheerfulness of many more has been a well received balm. Let me just say that lose, draw, or win (however any one of those might be calibrated), my attitude will be about the same. K.D. Lang catches that spirit quite well in the lyrics of her song "Luck in My Eyes" (http://www.lyricsfreak.com/k/k.d.+lang/luck+in+my+eyes_20076951.html visited on September 23, 2007.) Regardless of the outcome, *JLE* has built up an inventory of manuscripts that justify an expectation of a second year that includes three issues of the *JLE*. That is something that has not happened since during Creighton Frampton AAEFE President's term of office. When the AAEFE Members assemble at 6:00 PM on Wednesday, March 26, 2008 in Las Vegas they will assemble with a reinvigorated *JLE*. Hopefully, when they depart around 4:00 PM on that Friday they will have clarity of situation and purpose as well as material diminution of rancor.

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