

## Damages in Antitrust Cases

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### Abstract

Antitrust economics and antitrust law are the subject of intense scholarly debate. However, the analysis of *antitrust damages*, in particular the quantitative estimation of those damages, has received much less attention. The policy debates about proper deterrence under the antitrust laws, and the application of antitrust laws in hotly-debated areas, are often lacking a firm empirical basis.

In this article, the authors use their practical experience in industries in which antitrust issues commonly arise, and their experience in estimating commercial damages in breach-of-contract cases, to examine the issue of properly identifying and estimating antitrust injury. In particular, the authors:

1. Identify reasons why the estimation of damages in antitrust has received less attention than in other areas of commercial damages.
2. Outline the basic principles of the economics of commercial damages and consumer welfare that underlay a proper estimation of antitrust damages
3. Suggest that case law alone will not provide an adequate basis for antitrust damages.
4. Note the ambiguities and gaps that exist in the range between legal doctrine about antitrust damages and the econometric techniques to identify and estimate them.
5. Provide case studies illustrating how empirical evidence alone, even under ideal conditions, will rarely provide a reliable basis for the econometric identification and estimation of antitrust injury.

Finally, we conclude with lessons for antitrust damages that can be applied by courts, as well as experts and advocates on both sides.

*JEL codes: K0, K4, L0, L4*

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## I. Introduction

### *The Antitrust Laws*

The Sherman Act, enacted in 1890, prohibits contracts, combinations, and conspiracy that restrain trade.<sup>1</sup> The Clayton Act established a private right of action under the antitrust laws.<sup>2</sup> These laws, along with other state and federal antitrust acts, are the basis of some of the most intricate commercial damages calculations.<sup>3</sup> The Clayton Act itself provides only a vague statement of damages even in the case of price-fixing:

In any action under section 15c(a) (1) of this title, in which there has been a determination that a defendant agreed to fix prices in violation of sections 1 to 7 of this title, damages may be proved and assessed in the aggregate by statistical or sampling methods, by the computation of illegal overcharges, or by such other reasonable system of estimating aggregate damages as the court in its discretion may permit without the necessity of separately proving the individual claim of, or amount of damage to, persons on whose behalf the suit was brought. [§ 4D Clayton Act, 15 U.S.C. § 15d.]

The broad language of the Sherman Antitrust Act suggests that all concerted activity that restrains trade is illegal. In developing the standards for interpreting the Act, courts consistently interpret Section 1 as condemning only unreasonable restraints of trade. In doing so, courts have identified certain conduct as illegal *per se*, and has required that other conduct be evaluated under a rule of reason, based on the effects under the specific circumstances before the Court. A *per se* rule condemns a category of conduct without requiring that the plaintiff (i) prove that the defendant possesses market power, (ii) prove an unreasonable outcome, such as higher prices or reduced output, and (iii) rebut the defendant's justifications.<sup>4</sup> For example,

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1. Sherman Act, 15 U.S.C. § 1 provides:

Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal.

2. Clayton Antitrust Act, 15 U.S.C. §§ 12-27, 29 U.S.C. §§ 52-53.

3. The other acts include the Federal Trade Commission Act, 15 U.S.C. § 45, enacted in 1914; and the Robinson-Patman Price Discrimination Act (which are sections 13a, 13b, and 21a of the Clayton Act, which Congress amended in 1936).

There are also many state laws that incorporate to some degree the language and standards of the Sherman Act, FTC Act, or other federal laws.

Among the many antitrust law references are those of the American Antitrust Institute, which contains a listing of key laws at: <http://www.antitrustinstitute.org/links/codes.cfm>.

in *FTC v. Superior Court Trial Lawyers Ass'n*, 493 U.S. 411 (1990), a group boycott aimed at raising the compensation for public defenders was found *per se* unlawful after little consideration of market power or the defendant's justifications.

For the types of conduct that are not subject to some form of *per se* condemnation, the plaintiffs are required to prove all of the elements of the case, which can be a daunting task. Although the difficulties of proving a full rule of reason case can be daunting, the antitrust laws reward successful plaintiffs with a nearly automatic treble damages (or triple damages) of damages that can be proven to be due to antitrust law violations, as well as shifting the costs of the litigation to the defendants. Section 4 of the Clayton Act provides “any person who shall be injured in his business or property by reason of anything forbidden in the antitrust laws may sue... and recover threefold the damages by him sustained, and the cost of suit, including a reasonable attorney’s fee.” 15 U.S.C. 15(a).

Regardless of whether the conduct is categorized as subject to the *per se* rule, the rule of reason, or a hybrid of the two, a private plaintiff may win the case by proving the defendants engaged in illegal conduct, but the win would probably be Pyrrhic unless the plaintiff could also prove damages caused by the defendants. In a famous case, the United States Football League proved that the National Football League engaged in conduct that violated the Sherman Act, but was unable to prove that the USFL was damaged. The result was an award of \$1 in compensatory damages to the USFL, which was trebled by the court to \$3. *United States Football League v. NFL*, 644 F.Supp. 1040, 1151-54 (S.D.N.Y. 1986).

In practice, however, proof of an antitrust violation and proof of antitrust damages are often more interrelated than may be indicated by judicial decisions drawing distinctions between the two. As discussed in the next section, the most challenging factors to prove regarding the existence of an antitrust injury are often the most difficult to establish regarding damages.

### ***Injury Under the Antitrust Laws***

Price-fixing is probably the most straightforward of antitrust injuries, as well as conceptually the easiest to understand in terms of the size of the damages. However, in practical applications even price-fixing analyses are quite difficult. There are several reasons for this, starting with the powerful dynamic of the unwillingness of price-fixing conspirators to reveal their actions to others. Other dynamics also come into play; cartels are (fortunately) notoriously difficult to enforce. By definition, a cartel that is successful in raising prices and restricting output is also successful in creating an incentive for each cartel member to “cheat.”<sup>5</sup> Even in the simplest of price-fixing cases, the “overcharge” is not listed on the invoices nor shown on the accounting income statement. An economist or other expert will have to estimate them, in a marketplace with competitors, changing costs, imperfect information, and customers whose income, preferences, and reaction to prices may have all changed during the time period in which the price-fixing had occurred.

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4. The Supreme Court explained its use of *per se* condemnation for certain categories of conduct as follows:

“This principle of *per se* unreasonableness not only makes the type of restraints which are proscribed by the Sherman Act more certain to the benefit of everyone concerned, but it also avoids the necessity for an incredibly complicated and prolonged economic investigation into the entire history of the industry involved, as well as related industries, in an effort to determine at large whether a particular restraint has been unreasonable -- an inquiry so often wholly fruitless when undertaken.” *Northern Pacific Ry. v. United States*, 356 U.S. 1, 5 (1958).

5. See, e.g., Hovencamp, *Antitrust Law, 2d ed.*(1995) chapter 4, on “the (virtual) universality of cartel cheating.”

Antitrust injury is made up of four elements: “(1) unlawful conduct, (2) causing an injury to the plaintiff, (3) that flows from that which makes the conduct unlawful, and (4) is of the type the antitrust laws were intended to prevent.” *American Ad Mgmt., Inc. v. General Tel. Co.*, 190 F.3d 1051, 1055 (9th Cir. 1999), citing *Brunswick Corp. v. Pueblo Bowl-O-Mat, Inc.*, 429 U.S. 477, 489 (1977).

Courts have consistently interpreted the fourth element as requiring that plaintiffs show that the harm they experience is an “injury of the type that the antitrust laws were intended to prevent.” *Atlantic Richfield Co. v. USA Petroleum Co.*, 495 U.S. 328, 334 (1990). It is not necessary for the antitrust violations to be the sole cause of the injury, only that the antitrust violations be a “material cause” of the injury. *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 114 n.9 (1969). For example, in the *Brunswick* case, the plaintiffs claimed that they lost profits due to Brunswick acquiring their money-losing competitors and running the competitors more efficiently. The Supreme Court agreed that the plaintiffs were harmed, but the harm was due to the preservation of competition rather than anti-competitive restraints on competition. Therefore, an award of damages would be “inimical to the purposes of these laws” because the plaintiffs were seeking damages “to provide them with the profits they would have realized had competition been reduced.” *Brunswick*, at 488.

Courts have held that while plaintiffs must show the existence of an antitrust injury with a “reasonable degree of certainty,” the proof of the amount of a plaintiffs damages is subject to a lower burden of proof. *J. Truett Payne Co. v. Chrysler Motors Corp.*, 451 U.S. 557, 565-68 (1981). In the *J. Truett Payne* case, the Supreme Court held that “vagaries of the marketplace usually deny us sure knowledge of what plaintiff’s situation would have been in the absence of the defendant’s antitrust violation. *Id.* at 566. ““The constant tendency of the courts is to find some way in which damages can be awarded where a wrong has been done. Difficulty in ascertainment is [not to be] confused with right of recovery” for a proven invasion of the plaintiff’s rights.” *Bigelow v. RKO Radio Pictures, Inc.*, 327 U.S. 251, 265-66 (1946), quoting *Story Parchment Co. v. Paterson Parchment Paper Co.*, 282 U.S. 555, 563 (1931). Nonetheless, the plaintiff must have some basis for demonstrating the harm.<sup>6</sup>

The Supreme Court has held that damages may be shown using “a just and reasonable estimate, based on relevant data,” including both “probable and inferential as well as direct and positive proof.” *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 123 (1969). If damages cannot be calculated, except by speculation or guesswork, a court may still enter a finding of antitrust liability and award nominal damages and attorneys fees. *See, e.g., Rosebrough Monument Co. v. Memorial Park Cemetery Ass’n*, 666 F.2d 1130, 1147 (8th Cir. 1981), cert. denied, 457 U.S. 1111 (1982), *United States Football League v. NFL*, 644 F.Supp. 1040, 1151-54 (S.D.N.Y. 1986).

This lower precision is the rule in antitrust analysis, in which the facts on prices, costs, and consumer responses to those prices are almost always incomplete or difficult to estimate. Courts have recognized this inherently lower ability to estimate damages, and have accepted damages estimates based on reasoned analysis and partial information.

The US Supreme Court’s decision in *Zenith Radio v Hazeltine* is particularly clear:

Trial and appellate courts alike must also observe the practical limits of the burden of proof which may be demanded of a treble-damage plaintiff who seeks recovery for injuries from a partial or total exclusion from a market; damage issues in these cases are rarely susceptible of the kind of concrete, detailed proof of injury which is available in other contexts. The Court has repeatedly held that in the absence

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6. A damage award may not be based on “speculation and guesswork.” *Bigelow*, 327 U.S. at 264. *See also, Farley Transp. Co. v. Santa Fe Trail Transp. Co.*, 786 F.2d 1342 (9th Cir. 1985), *Copper Liquor, Inc. v. Adolph Coors Co.*, 624 F.2d 575 (5th Cir. 1980).

of more precise proof, the factfinder may “conclude as a matter of just and reasonable inference from the proof of defendants' wrongful acts and their tendency to injure plaintiffs' business, and from the evidence of the decline in prices, profits and values, not shown to be attributable to other causes, that defendants' wrongful acts had caused damage to the plaintiffs.” 395 U.S. 100, 124 (1969) citing *Bigelow v. RKO Radio Pictures, Inc.*, 327 U.S. 251 (1946).

## II. Damages in Antitrust

### *The Economics of Collusion and Consumer Welfare*

The clearest economic concept in antitrust injury is that a cartel, by colluding in an effort to increase their profits, causes consumers to pay higher prices. This is easily motivated by the ubiquitous supply-demand charts favored in microeconomics course, in which the damage to consumer welfare due to a monopolist's actions can be graphically illustrated.<sup>7</sup>

However, there is an immediate economic challenge: when a monopoly suppresses supply and raises the market price, there are at least two effects: the “income” and the “substitution” effects.<sup>8</sup> The “income” effect is the first one that is usually demonstrated in the charts, at least for the single-period purchasers of the single commodity shown in the chart: they pay higher prices. However, the same chart shows that fewer units are sold. This means that some consumers reacted to the higher price not by paying the price, but by substituting for something else. This forced substitution is another form of injury.

The preceding discussion focused on consumer welfare. However, producers are also affected. In particular, competing firms may lose profits, or even be forced out of business. This form of injury does not fit some definitions of “consumer welfare,” but it is clearly part of the welfare of society.

### *Legal Bases for Damages: “Overcharge” and “Lost Profits”*

The economic effects on consumers and producers are reflected in two legal measures of damages. Determining the appropriate legal measure of damages depends on the nature of the alleged restraint on competition.

In price fixing cases under Section 1 of the Sherman Act<sup>9</sup> and monopolization cases under Section 2,<sup>10</sup> cartel members collude or a monopolist withholds output in an effort to increase profits, which causes consumers to pay higher prices. This is commonly called “overcharge” injury.<sup>11</sup> The Second Circuit has defined the proper measure of damages as “the price increment caused by the anticompetitive conduct or originated or augmented the monopolist's control over the market,” and not “the entire excess of the

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7. Such is the overlap between law and economics in this field that virtually the same charts appear in economics texts, law texts, and “law and economics” texts.

8. This insight, and the categorization of the two effects, are commonly attributed to Eugen Slutsky (1880-1948). The “Slutsky equation” is a decomposition using calculus of the effects of a change in price or quantity, which are sometimes called the “Hicksian demand” (the substitution effect) and the “Marshallian demand” (the income effect).

9. See, e.g., *Burlington Indus. v. Milliken & Co.*, 840 F.2d 1065, 1077 (2nd. Cir. 1988); *In re Potash Antitrust Litig.*, 159 F.R.D. 682, 697-98 (D. Minn. 1995).

10. See, e.g., *Package Shop v. Anheuser-Busch, Inc.*, 675 F.Supp. 894, 946 (D.N.J. 1987).

monopolist's price over that which would prevail in a competitive market." *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 297-98 (2d Cir. 1979), *cert. denied*, 444 U.S. 1093 (1980). The Second Circuit explained that this standard is needed to limit the damages to "simply to compensate its customers for the consequences of its wrongful action." *Id.* at 298. The same standard would apply to price fixing agreements, where the damages would be limited to the harm from the agreement, and not from any other factors causing a deviation from a competitive market price. It is worth noting that this precise description offered here, which is based in microeconomic theory, has not always been followed by the courts.<sup>12</sup>

For other types of antitrust violations, courts have measured damages as the lost profits of the plaintiff. In general, the "lost profits" of the purchasers encompasses both the income and the substitution effects on a company, which may include damages that exceed higher prices alone.<sup>13</sup> This approach has been used for damages involving predatory pricing,<sup>14</sup> resale price maintenance,<sup>15</sup> and refusal to deal.<sup>16</sup> The standard is normally lost net profits rather than lost gross profits. *Wolfe v. National Lead Co.*, 225 F.2d 427, 431 (9th Cir.), *cert. denied*, 350 U.S. 915 (1955).<sup>17</sup>

### ***Antitrust Damages Require Similar Industry Analysis***

Antitrust claims routinely involve specialized, often arcane legal analysis. One origin of this reliance on a complex network of shifting case law is simple: the statutes are simply not clear.<sup>18</sup> A second cause is the evolving economic understanding of competition in actual practice. This growth in economic knowledge led, during much of the past half-century, to an ongoing debate over the goals and results of US antitrust law. Probably the best known result of this debate has been the adoption of some tenets of the "Chicago School" of antitrust economics.<sup>19</sup> In particular, some aspects of information sharing and coordination of behavior has become accepted as probably pro-competitive. In particular, current case law accepts practices such as vertically-integrated franchise systems that involve information sharing and coordination that would probably been considered illegal a century ago.<sup>20</sup>

This has resulted in a frequent weakness in antitrust damages analyses: the failure to consider the same essential factors for business valuation that apply in other commercial damages cases. Relying on antitrust law and its application will be helpful in establishing the fact of damages, but will probably not be helpful

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11. There are other uses of "overcharge" as well: the seller's injury when a buyers' cartel suppresses the price; and the buyer's injury when they purchase a product that has been illegally "tied" to another product or service. See Hovencamp, *Federal Antitrust Policy*, 2d ed., section 17.5a. We concentrate in this section on the buyer's injury due to the action of a seller's cartel.

12. As Hovencamp notes, "the concept of *overcharge* is not self-defining." *Federal Antitrust Policy*, 2d ed, section 17.5a.

13. The methods of estimating lost profits in breach of contract suits are covered in texts such as Anderson (2004b), Gaughan (2003), and Anderson (2005).

14. *H.J., Inc. v. ITT*, 867 F.2d 1531 (8th Cir. 1989), *D & S Redi-Mix v. Sierra Redi-Mix and Contracting Co.*, 692 F.2d 1245 (9th Cir. 1982).

15. *Copper Liquor, Inc. v. Adolph Coors Co.*, 624 F.2d 575 (5th Cir. 1980).

16. *Lee-Moore Oil Co. v. Union Oil Co.*, 599 F.2d 1299 (4th Cir. 1979).

17. In some cases, courts have shifted the burden of proof to defendants to show a "disaggregation" of profits due to mismanagement by plaintiffs, a recession, etc., and also for failure by plaintiffs to mitigate damages.

18. Some scholars claim the vagueness of the original statutes was intentional, and that the sponsors of the Sherman Act explicitly desired the courts to apply common law principles and acquire experience with the laws.

in estimating their quantity. There is an interesting parallel here with the overreliance on accounting information we noted above for breach-of-contract commercial damages. By themselves, neither accounting, nor law, is sufficient to estimate economic damages.

### ***Competing Principles, Competing Remedies***

There are competing principles in antitrust law, and those that estimate damages under these laws must be cognizant of this fact. One principle is the “free enterprise” clarion:

Antitrust laws in general, and the Sherman Act in particular, are the Magna Carta of free enterprise. They are as important to the preservation of economic freedom and our free-enterprise systems as the Bill of Rights is to the protection of our fundamental personal freedoms. *United States v Topco Assocs.*, 405 U.S. 596, 608 (1973).

This principle, along with the difficulty in estimating damages and proving them, is one of the reasons why the courts adopted the “*per se*” rule for certain antitrust violations. As Richard Posner notes, “few cases were brought in the early years of the Sherman Act. Yet by 1898 the Supreme Court had established the principle, immensely important to the development of a sound antitrust policy, that cartels and other price-fixing agreements were illegal regardless of the “reasonableness” of the price fixed.”<sup>21</sup>

Another principle is the enhancement of consumer welfare. This principle has been forcefully argued by economists and legal scholars associated with the “Chicago School.” Partially as a result of this critique, courts examine some antitrust claims under a “rule of reason” approach, in which the benefits of the alleged collusion or other prohibited behavior are weighed against the costs. In particular, purely “vertical” arrangements in which information on prices are shared among multiple entities—such as franchises—are now considered to have many benefits to consumers.<sup>22</sup> Thus, alleged collusion among purely vertical entities is typically considered under a “rule of reason” approach.

A third principle is deterrence, often defined in terms of “optimal sanctions.” The difficulty in catching and prosecuting antitrust law violators was one rationale for the treble-damages provision of the Clayton Act.

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19. An excellent example of this are the two editions (1976 and 2001) of Richard Posner’s *Antitrust Law*, which reads, like most antitrust discussions, like an applied microeconomics discussion, albeit with a plethora of legal citations. The time period in between their publications included significant changes in the case law, most of which was consistent with the Chicago School critique stated in the first edition. Hovencamp, in *Federal Antitrust Policy, 2d ed.*, chapter 2, summarizes from a legal perspective the changes that have resulted from the Chicago School critique.

20. Posner, in *Antitrust Law, 2d ed.*, provides a long explanation of the process by which antitrust doctrine evolved to this point.

21. Richard Posner, *Antitrust Law, 2d ed.*, University of Chicago Press, 2001, p. 35.

Another milestone is the Supreme Court’s decision in *United States v. Socony-Vacuum Oil Co.*, 310 US 150, 211-212 (1940): “price-fixing combinations are illegal *per se*, they are not evaluated in terms of their purpose, aim, or effects in the elimination of competitive evils.”

See also, Michael D. Whinston, *Lectures on Antitrust Economics*, Chapter 2. Northwestern University Center for the Study of Industrial Organization, working paper no. 0040.

22. For example, a manufacturer in a competitive industry may establish a suggested retail price for its product, and establish minimum standards for its franchised system or retailers, as is common in the automobile industry. However, note that this collusive behavior within the vertically-arranged franchise system is beneficial only when other competing vertically-arranged franchises also provide consumers with choices, as is also the case in the automobile industry.

Today, there is a heated debate over whether the sanctions in the antitrust laws are too severe or too lenient. In particular, some scholars claim the current penalties “overdeter” offenders, while others argue that they are relatively low risk of being prosecuted “underdeters” potential defenders.<sup>23</sup>

### ***Defense Strategy and the Amorphous Doctrine***

The shifting sands underneath antitrust doctrine create both opportunities for zealotry in enforcement, and for fulsomeness in defense. Consider what has become a reasonably common defense strategy: argue that consumer welfare is the primary goal of antitrust; further argue that there are offsetting consumer benefits to counter the (alleged) losses in consumer welfare; and then argue that the proposed damages would (especially if “trebled”) would lead to over-punishing the alleged wrongdoers. This strategy was summarized by one experienced litigation economist as “find a ‘chicago’ economist to explain it all away.”

Such a strategy can be profitable when one other crucial feature is missing: a clear identification of damages. If damages can be demonstrated, then a jury would be tempted to find both a violation of the laws and a damages amount to award. We consider next whether economic analysis of empirical data has a good chance of demonstrating damages when collusion actually takes place.

## **III. Damages and The Daunting Econometric Challenge**

Many antitrust cases involve disputes over what the law actually means, what behavior actually occurred, and the degree of damages. In this section, we assume that the law and the facts are quite clear; the only question is what damages occurred. In particular, we illustrate the daunting challenge of econometrically isolating evidence of collusion in a price-fixing case, and then estimating the damages if such evidence is found.

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23. Posner again has one of the more accessible introductions to this topic; see *Antitrust Law, 2d ed.*, chapter 10. Posner is a leading exponent of the theory that the underlying principle of antitrust law should be economic efficiency, meaning the enhancement of consumer welfare, and argues for optimal sanctions from this perspective.

The major contentions in the debate over whether current statutes over-deter, or under-deter, antitrust violations are vividly illustrated in the comments from various parties to proposed FTC rules regarding antitrust laws. The American Antitrust Institute’s comment to the FTC on the use of “disgorgement” remedy summarizes this position as follows:

The current levels of antitrust damage awards are substantially lower than they should be to deter antitrust offenses optimally. The Clayton Act provides for “treble” damages, and if antitrust damage levels truly were at this level they might well be adequate to deter anti competitive conduct optimally. However, a close examination reveals that antitrust’s so-called “treble” damages remedy is probably at most single damages. [American Antitrust Institute letter, March 29, 2002; citations omitted.]

In contrast, the antitrust section of the American Bar Association is much more cautious:

The availability of private remedies means that the Commission’s pursuit of disgorgement usually is not needed to remedy an antitrust violation...Given the likelihood that treble damages will more than suffice to deprive the defendant of any gains from an antitrust violation, the remedy of disgorgement will ordinarily not be necessary. [American Bar Association letter, March 11, 2002.]

These and other comments are available on the FTC site at: <http://www.ftc.gov>.

A standard approach in price-fixing cases is to examine data for collusion using econometric techniques. This requires a model of the price under normal market conditions, and then a hypothesis test for collusive pricing, which may require additional variables and parameters to be estimated.

### ***A Simple Linear Model***

Probably the simplest econometric approach would be to estimate the following linear model for multiple producers selling a similar commodity in the same market, and their prices over time:

$$: Price_{it} = \alpha_i + \beta_{i1}X_{1t} + \beta_{i2}X_{2t} + \beta_{i3}X_{3t} + \gamma_i C_t + \varepsilon_{it} \quad , \quad (1)$$

where  $\alpha_i$  is the trend rate of growth for the  $i$ th commodity;  $\beta_{i1}$  is the parameter on the first casual variable  $X$  for the  $i$ th producer's commodity, with three such variables and related parameters included in the example equation; and  $\varepsilon_{it}$  is the error term for the  $i$ th commodity at time  $t$ . Causal variables could include the cost of the raw materials or other inputs to manufacture and distribute the commodity; the prices of substitutes; and variables that represent the underlying economic activity or demand for the commodity. Another set of possible causal variables are those representing the degree of competition among non-colluding purchasers or providers.

The variable  $C$  would be a possible causal variable for collusive activity, or a dummy variable (a variable that takes the value zero or one, depending on the conditions being tested). For example, it could be the number of firms that belonged to an industry cooperative body that was alleged to coordinate pricing; or a time-dummy variable that took the value one during the time period in which a cartel allegedly was actively attempting to fix prices.

If such an equation adequately explained the actual underlying price, given sufficient data it would be possible to estimate the effect of the alleged collusion on the price. This effect would be captured by the parameter  $\gamma_i$  for the  $i$ th commodity. Indeed, it may be possible to rely on a formal statistical test (known as a hypothesis test) of the "null" hypothesis that the alleged collusive activity had no effect on the price, against the alternative hypothesis that the alleged collusive activity did affect the price.

### ***Possible Errors in the Simple Linear Model***

Although this is the textbook example, it is rarely adequate in the real world. There are a number of difficulties and weaknesses in the simple linear model, any one of which could render the results unreliable. These include:

1. The model itself may be incorrectly specified.

This is probably the biggest source of error, and is often undetected. The first reason why this occurs is that nearly every model of the real world omits some variables that affect, in at least a small way, the dependent variable. Because economics is a social science, and the behavior being modeled involves people, the second reason is also obvious: people do not behave according to neat, linear models. The last reason why misspecification error is often undetected is that the true model is rarely known.

We consider here two kinds of misspecification: omitted variables, and wrong functional form.<sup>24</sup> Both can be serious problems, or minor problems.

2. The data are incomplete, or erroneously reported.

The acquisition of proper data is a constant challenge in the real world. Academic texts often can rely upon assumed data; in the real world, data are measured incorrectly, reported irregularly, cover time periods involving changes of terms and specifications, and are often unobserved or nonexistent. Furthermore, other factors in the economy, such as changes in the distribution or packaging of commodities, may also affect prices.<sup>25</sup>

Note that the “data” we are discussing includes the price and quantity data for the commodities in question, as well as other causal data such as economic conditions, industry factors, related prices, and government policies such as taxes and regulations.

3. Information on the alleged collusion may be incomplete, disputed, or incorrect.

This factor is present in nearly every antitrust case. Often the existence of a collusion is disputed, the time period in which the collusion is disputed, the market definition is disputed, and the market participants are also disputed.

4. The person collecting the data and estimating the model may have committed an error.

This is always a potential source of error. Unlike model misspecification, which is probably under-diagnosed, this is potential source or error is almost certainly over-diagnosed in antitrust cases. Typically, an opposing expert or the attorneys representing the other side will, at least in the United States, attempt to challenge the expert’s testimony on one of many fronts. This occurs even in cases involving experienced experts working on matters in which they have considerable expertise.

One might note that these errors cover every facet of the simple model! Thus, there is very little that is truly simple about the “simple” model.

### *Using the Simple Linear Model*

Of course, a specific econometric is not—and should not be—codified into law. In the statute itself, there is very little about the determination of damages. Therefore, like much of antitrust law, case law and economic writings are the bases for the determination of damages.

Unfortunately, the case law lags far behind the economics. A recent review of antitrust litigation by Molly L. Zohn concluded that “antitrust damage estimation in one area of law wherein courtroom statistical evi-

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24. For example, the “linear” model shown in the example could be transformed into a log-linear model if the underlying behavior was closer to a multiplicative relationship among the variables rather than an additive one. This is often the case in economic production.

For example, a product sold at retail where the profit margins were fairly constant, but where input prices changed, might be modeled as:

$$P = AX_1^\beta X_2^\gamma e$$

where the first  $X$  is a variable representing the cost of providing the commodity, and  $A$  is a fraction (such as 1.2) that reflects the retail markup and other costs as a ratio of the production costs. In such an equation, the second  $X$  variable can include other causal factors, including potentially a variable that correlates strongly with the alleged collusion. The equation can be transformed into an additive one by taking natural logarithms of both sides, and assuming that the error term is log-normal.

dence has failed to keep pace with statistical advances in the field.”<sup>26</sup> As we will see in the case studies presented in the next session, the econometrics and standards of proof make it difficult to “prove” damages, let alone estimate them, without information beyond the price and quantity data that would actually be used in an equation.

## IV. Case Study: The Difficulty of Detecting and Estimating Damages

### 1. Simplest Example: Price Fixing by Cartel

Consider what is probably the simplest antitrust case: the classic price-fixing by an identified cartel. We will assume certain facts to make the analysis easier. In particular, we will assume the following:

1. Three large companies agreed to fix the price of their commodities, in an attempt to increase their profits. This agreement violated the Sherman Act.
2. The agreement started in 2004 and survived undetected for 5 years, during which the conspirators actively discussed prices and quantities under the guise of an industry cooperation council.
3. After 5 years, one of the conspirators became uncooperative and the council was unable to control prices. Two years later, a customer brought suit against the three members of the cartel, and the Court found each guilty of violating the Sherman Act.
4. We have access to monthly sales volume and pricing data for multiple commodities for each company, plus an index of industry prices on par commodities.

Such information would constitute an ideal amount of information, which could never be achieved in the practical world. We use this ideal framework to create an example data set, to allow us to test the difficulty of identifying and estimating antitrust injury.

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25. A classic example is the retail price of gasoline, for which extensive time series data are available in the United States. In recent decades, the change from full-service to self-serve gasoline clearly affected the cost of providing the commodity at the pump, as did the change from leaded to unleaded gasoline. Other factors include changes in state taxes; reformulation requirements that vary by area; and demand for “premium” gasoline by luxury and sport cars. Even severe weather can affect prices; the Hurricane Katrina affected the US refining capacity, and the response of some international suppliers, also affected prices. Some historical series explicitly note these and other cost factors; others do not.

See US Dept. of Energy web site, statistics page and “A Primer on Gasoline Prices,” found at: [http://www.eia.doe.gov/oil\\_gas/petroleum/data\\_publications/wrgp/mogas\\_history.html](http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_history.html); and [http://www.eia.doe.gov/pub/oil\\_gas/petroleum/analysis\\_publications/primer\\_on\\_gasoline\\_prices/html/petbro.html](http://www.eia.doe.gov/pub/oil_gas/petroleum/analysis_publications/primer_on_gasoline_prices/html/petbro.html). See also US DoE *Annual Energy Review*, available at: <http://www.eia.doe.gov/emeu/aer>.

26. Molly L. Zohn, *How Antitrust Damages Measure Up with Respect to the Daubert Factors*, Geo. Mason Law Review (13:3), 2005. Zohn discusses specifically two methods of calculating damages, the “before and after” and “yardstick” method, and concludes that neither meet both the legal standards that might be applied under Daubert, and the standards of professional practice used by econometricians.

*Econometric Analysis of Simple Price-Fixing Model*

To test the difficulty of detecting and estimating antitrust injury using econometric techniques, we created a sample dataset consisting of five producers each selling a similar product, at well-identified prices, in a market described under “Simplest Example: Price Fixing by Cartel” on page 10.

The prices in the market, in this simplest case, are illustrated in a series of figures:

- Figure 1., “Prices and Surcharges, Two Collusionists” on page 12 shows the surcharges or price reductions by two collusionists, in order to make their prices match, over time. The same figure shows how the prices varied before and after the period of collusion. Of course, we were able to identify and calculate this because we created the data. The real test will come later, when we do not allow the creator of the data to also identify the collusion.
- Figure 2., “Supply Prices Affecting Market” on page 13, shows supply prices affecting each of the providers. These supply prices are based on a combination of actual monthly energy prices in US cities, from 1995 through 2006.
- Figure 3., “Prices Among Collusionists With Supply Shocks” on page 14, shows how embedding the supply prices into the prices charged by collusionists would affect the prices in the market. An energy or other cartel could collude around prices that are affected by local conditions and costs, including transport costs. Indeed, the OPEC oil cartel does exactly that.<sup>27</sup>

With perfect knowledge of prices and the manner in which they were created, no underlying supply shocks or varying cost differences, and an explicit price-matching policy among a subset of a small number of suppliers, it is possible to illustrate the price fixing activity. However, what if we do not have such perfect knowledge?

We illustrate this in the next series of figures.

- Figure 4., “Econometric Model of Non-colluding Provider’s Prices” on page 15 shows the results of a simple econometric model that estimates one provider’s prices on the basis of supply prices and other firms’ prices. As can be seen by the residuals at the bottom, and the closeness of the fit, this model explains the prices extremely well. This particular example is of a non-colluding provider.
- Figure 5., “Econometric Model, Collusionists Prices” on page 16, shows the same results of estimating a model of a collusionist’s prices. There is nothing that demonstrates any difference between the model’s ability to explain prices here, for the collusionist, and before for the non-collusionist.

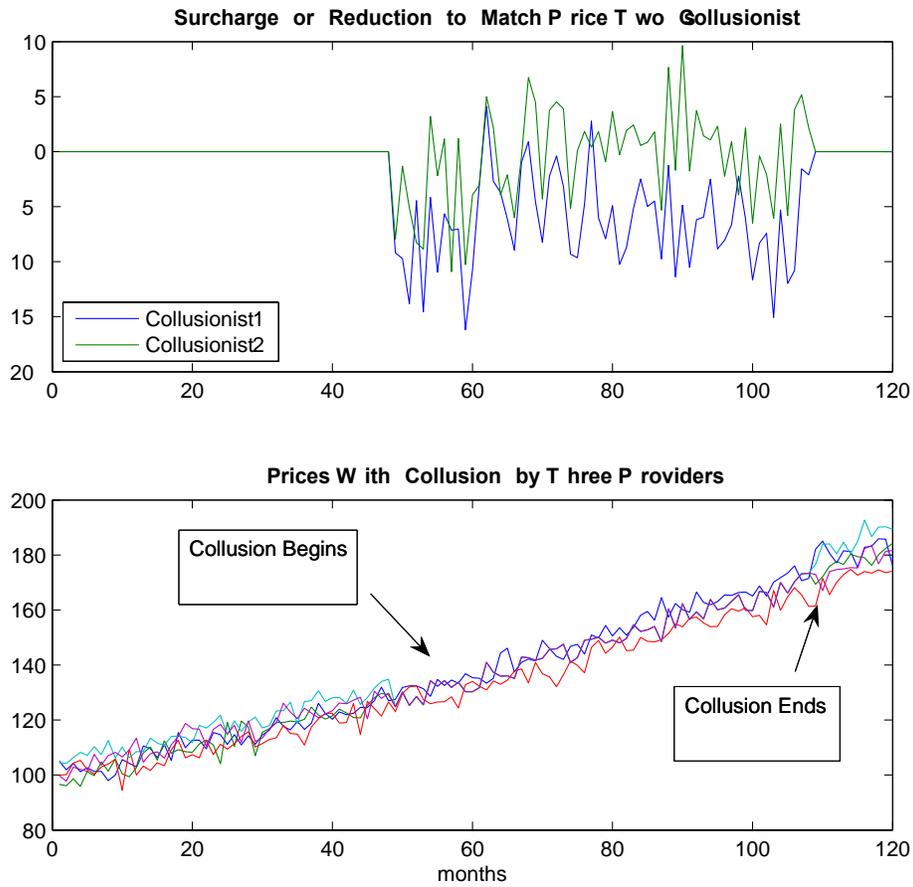
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27. The OPEC cartel is reasonably frank about its intentions, and describes its purpose in terms not significantly different than many past cartels:

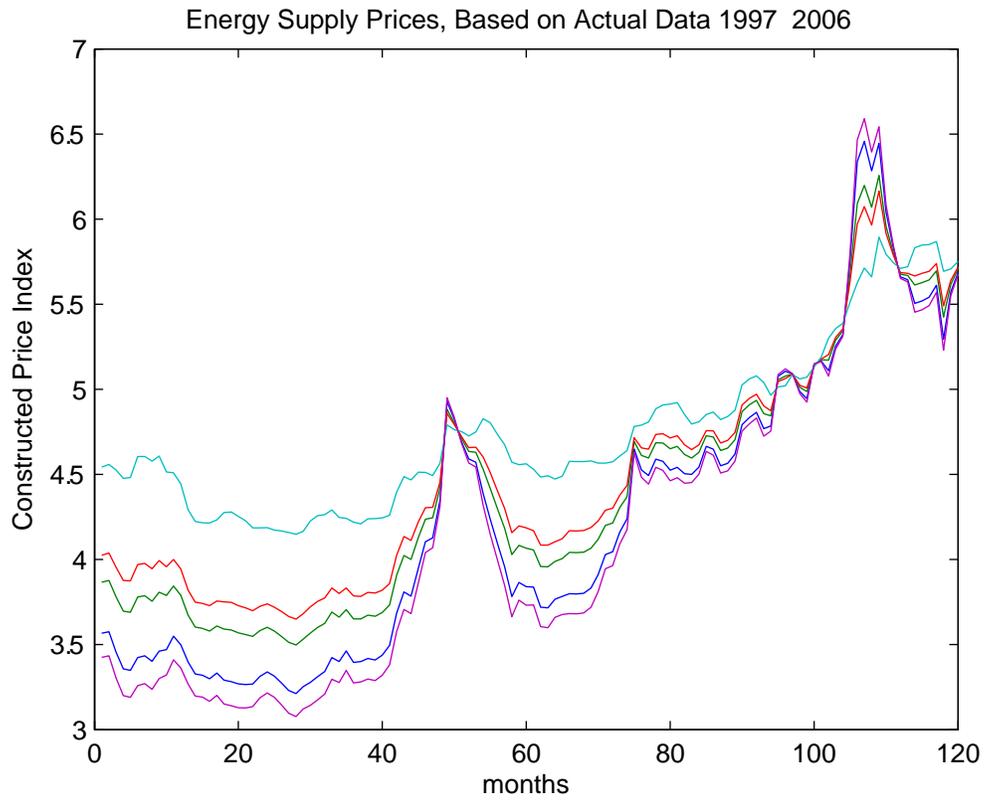
OPEC’s mission is to coordinate & unify the petroleum policies of Member Countries & ensure the stabilization of oil prices in order to secure an efficient, economic & regular supply of petroleum to consumers, a steady income to producers & a fair return on capital to those investing in the petroleum industry. [OPEC mission statement, on home page of OPEC web site, February 2007]

The OPEC 2005 *Annual Statistical Bulletin* reports on costs of transportation and varying local prices. It is not clear whether the *Bulletin* accurately reports all prices, given the existence of “cheating” by some of its member states. See the OPEC web site at: <http://www.opec.org>.

Figure 1. Prices and Surcharges, Two Collusionists



**Figure 2. Supply Prices Affecting Market**



**Figure 3. Prices Among Collusionists With Supply Shocks**

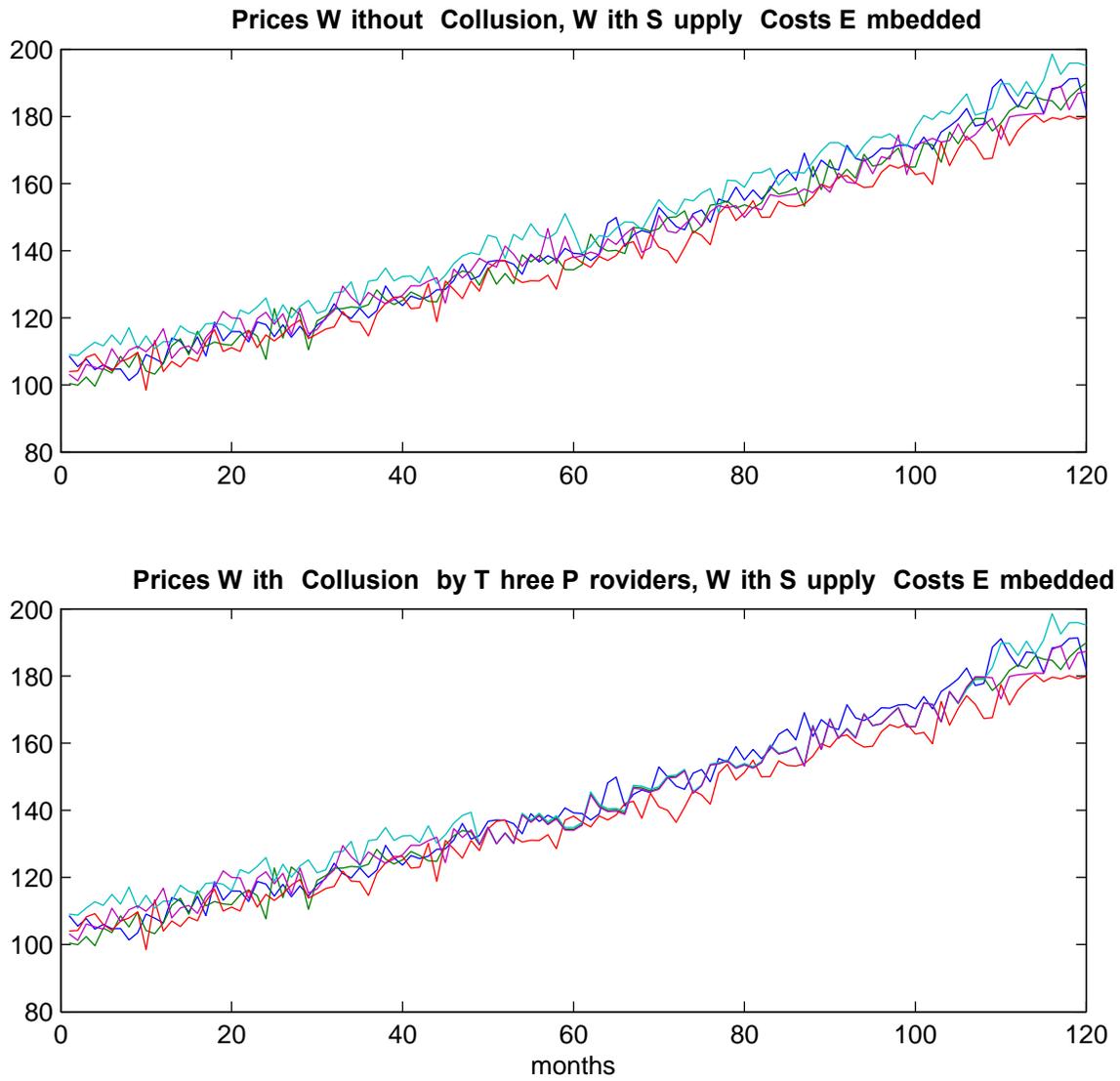
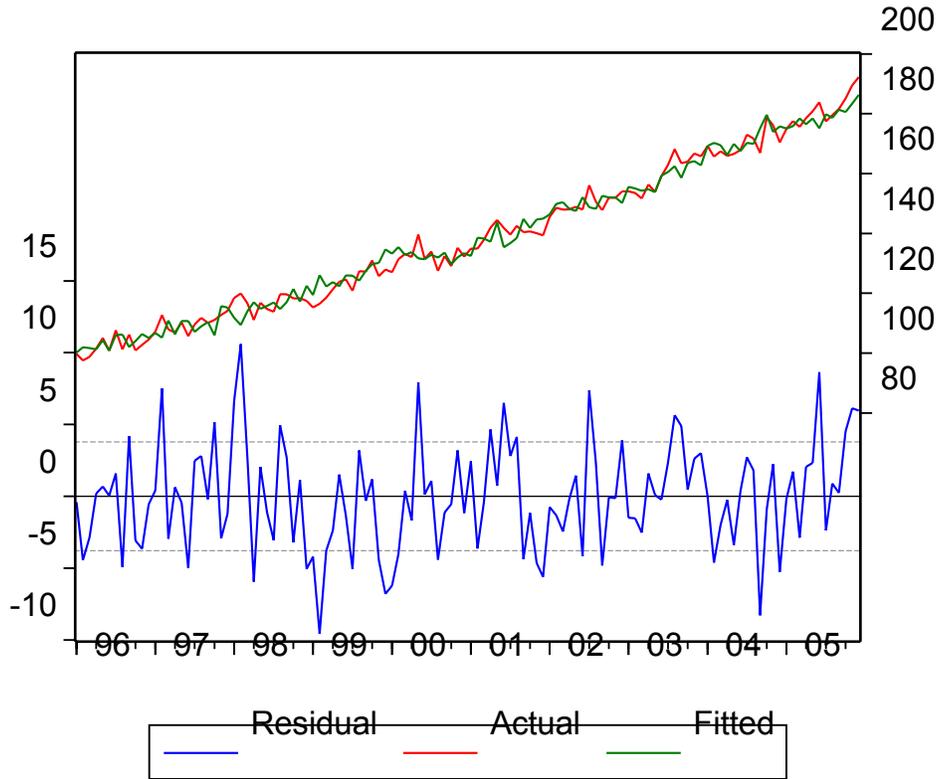
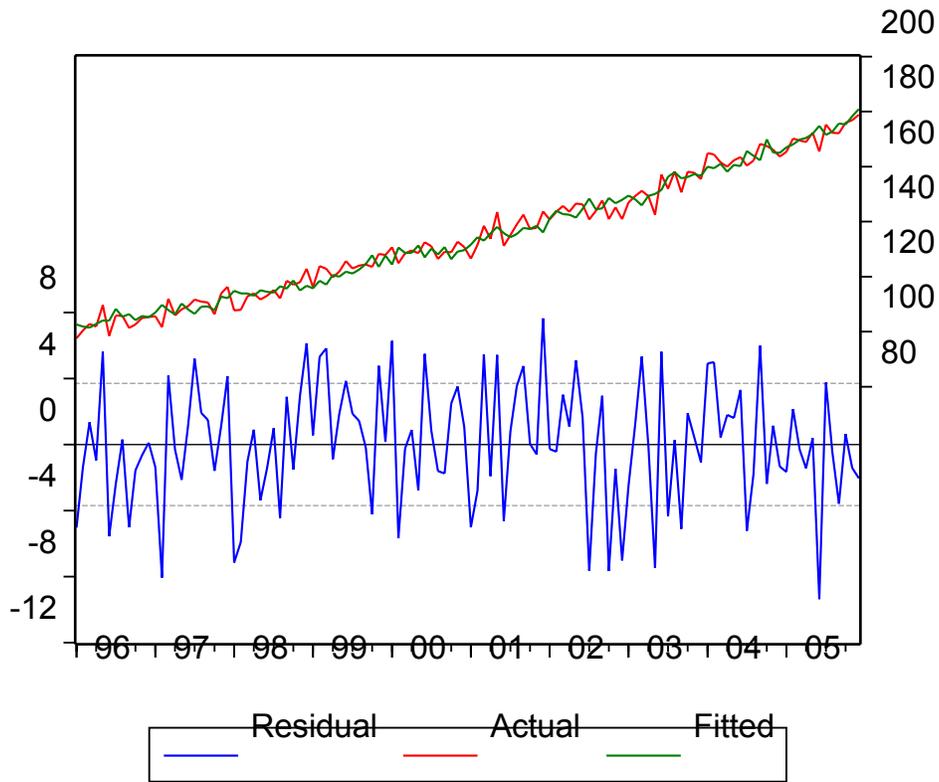


Figure 4. Econometric Model of Non-colluding Provider's Prices



**Figure 5. Econometric Model, Collusionists Prices**



**2. Example: Resale Price Maintenance Surcharge**

Consider another example. A franchisor with multiple brands “positions” each brand into a slightly different price category. Such a market exists in numerous vertically-integrated industries, such as automobiles (e.g., General Motors and its franchised dealers carrying Chevrolet, Buick, Cadillac, and other vehicles); restaurants (e.g., Yum Brands and its franchised Kentucky Fried Chicken, Pizza Hut, Taco Bell, and other restaurants); Hotels (e.g., Marriott International and its franchised Marriott, Courtyard, Fairfield Inn and other hotels). Although some or most of the franchisees are individually owned, the franchisor exercises significant control over them.<sup>28</sup>

28. “Franchises” exist when a franchisor and franchisee have a business arrangement with three essential elements: the creation of a brand by the franchisor under which the franchisees do business; significant control by the franchisor; and payment of a fee by the franchisee. See Federal Trade Commission, “Disclosure Requirements and Prohibitions Concerning Franchising and Business Opportunity Ventures,” effective October 21, 1979, 16 C.F.R. Part 436; Patrick L. Anderson, *Business Economics and Finance*, CRC Press, 2004; Roger Blair and Francine LaFontaine, *Economics of Franchising*, Cambridge University Press, 2005.

The franchisor in such arrangements often pressures the franchisees into setting prices that fit the franchisor’s strategic objectives. Often, though not always, these objectives are entirely consistent with the interests of the majority of the franchisees, and consistent with the fundamental principles of the franchise agreement among the franchisees and the franchisor. However, in some cases the pressure to fulfill the franchisor’s objectives crosses the line into price-fixing at the franchisee level. Sometimes this price-fixing takes the form of a minimum resale price maintenance (“RPM”) agreement, though not always.

Can we determine, through examination of price data alone, whether such a price-fixing scheme has been

**Table 1. Unit Retail Prices Among Same-Franchisor in Example Markets**

Market	Price Range, Brand A	Price Range, Brand X	Typical Difference
Market 1	\$7-10	\$8-12	\$1-2
Market 2	\$7-10	\$8-12	\$1-2
Market 3	\$6-9	\$7-10	\$1-2
Market 4	\$8-9	\$9-13	\$1-4

imposed on the franchisees in one or more of the markets? Consider the data in Table 1, “Unit Retail Prices Among Same-Franchisor in Example Markets,” on page 17. In this table, “Brand A” is the price leader, according to the national brand positioning established by the franchisor. In three of the four markets, there is a consistent price spread between Brand A and its upmarket competitor, Brand X. Assuming, again, that we have accurately captured the price differences with the data in the table, that there are no other regional cost of service differences or competing-brand differences that explain a variation in the price spread between the brands; and these price differences persist for a significant amount of time. Do the data alone tell us whether there is price collusion in any market?

The answer is no. There *could* be pressure in three of the four markets to maintain a price spread, and the franchisees in market 4, or at least one of them, refused to go along with the franchisor’s efforts to coordinate pricing across multiple brands. Conversely, the typical spread could be the result of a refusal of the franchisor to allow the franchisee to provide the service, or to bid on the business. There could be business-plan differences among the entrepreneurs that run the franchisees in different markets. The data here prove nothing.

However, what if the Brand X franchisees claimed that, in market 4, they had been forced to set prices at an artificially high level. As a result, the Brand A franchisee was winning a lot of business, even though Brand A’s prices in that market were *higher* than in competing markets. In such a fact situation, either a private action or an enforcement action taken by federal authorities could result in a finding of a Sherman Act violation, in the form of minimum RPM or some other violation. Assuming there was a violation, what were the damages?

There are a number of options, including the following:

1. Using a “yardstick” method, construct the “yardstick” for market 4 from the first three markets. Compared to these other markets, Brand A and Brand X were overpriced. The higher price, multiplied by the unit sales, could be estimated as the direct cost to consumers of the price-fixing collusion.

2. Using a “before and after” method, the same data could be used to support a finding of no damages at all. If, as explicitly assumed above, the price relationships had been stable for some time, a “before and after” examination may show that prices in Market 4 had been higher in the past. Therefore, using this logic, higher prices today indicated there was nothing new or even necessarily bad that had happened.
3. Another method, which would require additional data, would be to directly use pricing instructions to see how the franchisor pressured the franchisee to raise the price. If this data were available, and the data shows a persistent overcharge for one or more brands, it could be used directly to estimate damages to consumers.
4. Using a sophisticated econometric analysis, one might prepare a pricing model for the market, and estimate damages as the difference between the price that was charged, versus the price estimated by the model.

This is a hypothetical question, and the answer could depend on the items that were not listed in the example. However, it is instructive.

## **V. Conclusion: Antitrust Damages**

Based on our practical experience, and the evidence on econometric identification of damages presented above, we have compiled a short list of conclusions. These include observations about the information needed to begin an antitrust injury analysis, methods of estimation and limitations on the power of econometric analysis alone, and guidance on when to use them.

1. *Economic and industry analysis are essential.*  
To complete an antitrust injury analysis requires much of the same industry and economic analysis as would be required for a business valuation for the subject firm. If there are antitrust damages, their estimation requires a similar understanding of the company and the marketplace as would be required for other types of commercial damages.
2. *Empirical analysis requires precise and often restricted identification of market and product.*  
Antitrust legal doctrine requires an identification of the market, and the product or service. In order to complete an empirical analysis, this identification may need to be further restricted. In many cases, the facts in the case may establish collusion, or evidence of collusion, for products, services, and markets for which the available data do not allow quantitative analysis.
3. *Separate the discussion of legal standards from the identification of damages.*  
Because there are competing purposes to antitrust law, a damages estimate should be grounded in a specific legal standard. The prevailing legal standards for antitrust require some economic understanding, and a forensic economist is often required to perform much more analysis in the grey area between pure economics and pure law in antitrust than in breach-of-contract cases. However, separating the discussion of legal standards allows the court to decide those issues without necessarily rejecting the economist's damages analysis.
4. *Consider the principles of damages in antitrust law, even though they are not always consistent.*  
The following questions are often helpful in identifying the best methods for estimating damages, as well as illustrating that proper legal standard must be identified: Should you estimate the violator's extra profits, or the victim's losses? Can you distinguish between harm to customers and harm to the particular plaintiffs (who may not be customers)? Did any competitors or customers actually benefit from the actions?

5. *Carefully consider whether the damages being identified are the type recognized by the antitrust laws.* Many breach of contract and business tort cases may superficially appear to give rise to antitrust claims (and potential treble damages), but cannot be turned into antitrust claims simply by pleading them as such. Similarly, be sure that the party claiming damages has legal standing to bring the case. Competitors complaining of price fixing, mergers, or monopolization must overcome some presumption that they actually benefit from the restraint on competition, and that they are bringing a claim that only customers have standing to bring.

Similarly, the State Action doctrine exempts anti-competitive conduct that is established by a state government (or by a local government under a delegation of authority from its state) and is actively supervised by the state. This issue often comes up in such industries as public utilities, transportation, beer and wine distribution, insurance, and businesses requiring a government license to operate.

6. *Use similar techniques for antitrust and other commercial damages estimation.* This includes approaches such as the “yardstick” or “before and after” if appropriate, as well as income approaches when the “yardstick” isn’t available.
7. *Be specific in the assumptions, limitations, and data that are used in the damages analysis.* Often, it is not possible to estimate antitrust damages with anywhere near the precision of commercial damages in breach-of-contract claims, and the economist must estimate more factors using professional judgement. The case law recognizes that antitrust damages must be estimated under conditions involving relatively scant empirical information, and often the active resistance of one or more parties to the creation or collection of the desired data.
8. *Econometric analysis alone will rarely identify antitrust injury.* Our practical experience also underscores the difficulty in detecting and proving collusion, even when the facts clearly establish that collusion took place. Even under ideal circumstances, the price and quantity information that might be obtained are often insufficient to adequately prove collusion. As demonstrated by Anderson, an ideal data set consisting of accurate data on prices provided by multiple providers, on comparable products, at regular dates, with no changes in underlying economic conditions, may not be enough to demonstrate beyond reasonable doubt collusion using normal statistical methods.

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