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The Lost Profits Measure of Damages in Price Enhancement Cases

Jeffrey L. Harrison*

I. INTRODUCTION

In private antitrust actions involving price fixing or other methods of price enhancement,¹ courts generally use the illegal overcharge measure of damages. The illegal overcharge is the difference between the illegally enhanced price and the price that would have prevailed in the absence of the illegal conduct, multiplied by the volume of the good purchased by the plaintiff.² In 1968, the United States Supreme Court ruled that a defendant cannot escape liability for the full amount of an illegal overcharge by showing that the plaintiff purchaser has either partially or completely passed on the overcharge to indirect purchasers.³ More recently, the Court, largely in the interest of

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1. For convenience, price fixing will be used throughout this Article as a general example of the type of price enhancement case in which illegal overcharge is used as the measure of damages. Of course, the illegal overcharge remedy is available in a variety of other price enhancement situations including monopolization, *see, e.g.*, *Hanover Shoe, Inc. v. United Shoe Mach. Corp.*, 392 U.S. 481 (1968), and refusals to deal, *see, e.g.*, *Straus v. Victor Talking Mach. Co.*, 297 F. 791 (2d Cir. 1924). For a summary of the various damage measures that are employed in antitrust cases, *see* Guilfoil, *Damage Determination in Private Antitrust Suits*, 42 NOTRE DAME LAW. 647, 675-76 (1967).

2. *See* *Chattanooga Foundry & Pipe Works v. City of Atlanta*, 203 U.S. 390, 396 (1906).

3. *Hanover Shoe, Inc. v. United Shoe Mach. Corp.*, 392 U.S. 481, 494 (1968). The Court explained that the gross overcharge measure is grounded in traditional legal doctrine:

The general tendency of the law, in regard to damages at least, is not to go beyond the first step. As it does not attribute remote consequences to a defendant so it holds him liable if proximately the plaintiff has suffered a loss. The plaintiffs suffered losses to the amount of the verdict when they paid [the illegal price]. Their claim accrued at once in the theory of the law and it does not inquire into later events The [defendant] ought not to be allowed to retain his illegal profit, and the only one who can take it from him is the one that alone was in relation to him, and from whom the [defendant] took the sum.

Id. at 490 n.8 (quoting *Southern Pac. Co. v. Darnell-Taenzer Lumber Co.*, 245 U.S. 531, 533-34 (1918)).

The *Hanover Shoe* Court also identified several practical reasons for using the gross overcharge measure in price enhancement cases. First, since a wide

consistency, held that indirect purchasers cannot use the "pass on" theory as a basis for recovering damages from remote producers.⁴

The effect of these decisions has been threefold. First, commentators have begun to examine the problem of apportioning overcharge damages among the various levels of the vertical production chain through which a good passes.⁵ Second, a vigorous debate has ensued over the merits of the pass-on defense and indirect-purchaser standing.⁶ Finally, legislation has been introduced that would allow assertion of the pass-on defense and recoveries by indirect purchasers.⁷

This activity seems premised on the mistaken notion that practical considerations and antitrust policy require the use of either a gross or pass-on adjusted overcharge measure of dam-

range of factors influence a company's pricing policies, the Court believed that the impact of a single change in the relevant factors could not be isolated and measured after the fact. 392 U.S. at 492. Second, the Court observed that abandoning the gross overcharge measure for the pass-on adjusted measure would leave plaintiffs "the nearly insuperable difficulty of demonstrating" that they could not or would not have raised prices absent the overcharge. *Id.* at 493. Third, the Court complained that the pass-on adjusted overcharge measure was difficult to apply in the "real economic world" in which elasticities of demand cannot be determined so readily as in "an economist's hypothetical model." *Id.* Finally, the Court expressed concern that if it were to recognize the pass-on defense, "[t]reble damage actions would often require additional long and complicated proceedings involving massive evidence and complicated theories." *Id.*

4. *Illinois Brick Co. v. Illinois*, 431 U.S. 720, 736 (1977).

5. See Cirace, *Price Fixing, Privity, and the Pass-On Problem in Antitrust Treble-Damage Suits: A Suggested Solution*, 19 WM. & MARY L. REV. 171 (1977); Schaefer, *Passing-on Theory in Antitrust Treble Damage Actions: An Economic and Legal Analysis*, 16 WM. & MARY L. REV. 883 (1975). See generally E. TIMBERLAKE, *FEDERAL TREBLE DAMAGE ANTITRUST ACTIONS* 302-57 (1965); Gibbons, *The "Market Share" Theory of Damages in Private Enforcement Cases*, 18 ANTITRUST BULL. 743 (1973); Hoyt, Dahl & Gibson, *Comprehensive Models for Assessing Lost Profits to Antitrust Plaintiffs*, 60 MINN. L. REV. 1233 (1976); Lanzillotti, *Problems of Proof of Damages in Antitrust Suits*, 16 ANTITRUST BULL. 329 (1971); Parker, *Economics in the Courtroom: Proof of Damages in a Price-Fixing Case*, 9 ANTITRUST L. & ECON. REV. No. 4, at 61 (1977); Parker, *Measuring Damages in Federal Treble Damage Actions*, 17 ANTITRUST BULL. 497 (1972).

6. See, e.g., Beane, *Antitrust: Standing and Passing-On*, 26 BAYLOR L. REV. 331 (1974); Cirace, *supra* note 5; Handler, *Antitrust—1978*, 78 COLUM. L. REV. 1363 (1978); Harris & Sullivan, *Passing On the Monopoly Overcharge: A Comprehensive Policy Analysis*, 128 U. PA. L. REV. 269 (1979); McGuire, *The Passing-On Defense and the Right of Remote Purchasers to Recover Treble Damages Under Hanover Shoe*, 33 U. PITT. L. REV. 177 (1971); Pollack, *Automatic Treble Damages and the Passing-On Defense: The Hanover Shoe Decision*, 13 ANTITRUST BULL. 1183 (1968); Watson, *Bad Economics in the Antitrust Courtroom: Illinois Brick and the 'Pass-On Problem'*, 9 ANTITRUST L. & ECON. REV. No. 4, at 69 (1977); Note, *Denial of Standing to Private, Noncommercial Consumers Under Section 4 of the Clayton Act*, 31 VAND. L. REV. 1531 (1978).

7. See S. 300, 96th Cong., 1st Sess., 125 CONG. REC. S908-914 (1979); S. 1874, 95th Cong., 1st Sess., 123 CONG. REC. S12019 (1977).

ages in price enhancement cases. In fact, use of the gross overcharge measure is an unnecessary accommodation to the practical problems involved in proving damages and it tends to compensate victims in a manner that is inconsistent with the actual losses they have suffered. Moreover, the overcharge measure, even if modified by a pass-on defense and standing for indirect purchasers, ignores the damages resulting from the decrease in volume brought on by the enhanced price.⁸

This Article contends that lost profits rather than gross overcharge or pass-on adjusted overcharge is the most appropriate measure of damages in price enhancement cases because it accurately compensates victims while retaining the deterrent effect of the potential treble-damage action. In addition, use of the lost profits measure eliminates the practical problem of apportioning an overcharge fund among direct and indirect purchasers. The Article demonstrates that in many price enhancement cases, the lost profits measure would be a highly practical method of calculating damages. Part II briefly traces the development of current judicial attitudes toward antitrust damages in general, as well as toward the special case of illegal overcharge. Part III consists of a microeconomic analysis of the differences between the overcharge and lost profits measures, with special attention paid to the imprecision of the overcharge measure. Finally, Part IV demonstrates that there is a practicable method of calculating lost profits by a statistical technique—multivariate regression analysis—which is not susceptible to the practical problems of the pass-on adjusted overcharge. The Article suggests that if a lost profits rather than a gross overcharge measure of damages were used in price enhancement cases, there would be little reason for denying standing to indirect purchasers.⁹

II. DEVELOPMENT OF THE OVERCHARGE MEASURE OF DAMAGES

Since the damage a business suffers when it is the victim of an illegal overcharge is ultimately reflected either as a decline in current profits or as a lost opportunity for future profits, the effective enforcement of antitrust laws hinges on the willingness of courts to compensate victims at least for their lost profits. Indeed, the language of section 7 of the Sherman

8. See pp. 770-72 *infra*.

9. See text accompanying notes 119-129 *infra*.

Act¹⁰ and its successor, section 4 of the Clayton Act,¹¹ indicates that Congress intended courts to apply some compensatory measure of damages in private antitrust cases. The legislative history of these sections reveals, however, that Congress did not address the problem of measuring the damages sustained by victims of anticompetitive activity.¹² Evidently, Congress expected that this problem would be solved by the courts.¹³

Because of this lack of legislative guidance, the early prospects for private enforcement of the antitrust laws were not particularly encouraging.¹⁴ Courts began simply to transfer the restrictive common law attitude toward claims for lost profits to

10. Act of July 2, 1890, ch. 647, § 7, 26 Stat. 209 (repealed 1955). Section 7 of the Sherman Act had provided:

Any person who shall be injured in his business or property by any other person or corporation by reason of anything forbidden or declared to be unlawful by this act, may sue therefor in any circuit court of the United States in the district in which the defendant resides or is found, without respect to the amount in controversy, and *shall recover three fold the damages by him sustained*, and the costs of suit, including a reasonable attorney's fee.

(emphasis added).

11. 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 therefor in any district court of the United States in the district in which the defendant resides or is found or has an agent, without respect to the amount in controversy, and *shall recover threefold the damages by him sustained*, and the cost of the suit, including a reasonable attorney's fee.

15 U.S.C. § 15 (1976) (emphasis added).

12. The earliest discussions in Congress centered primarily on the constitutionality of an "anti-trust" bill in light of the commerce clause. *See, e.g.*, 20 CONG. REC. 1167-69, 1457-62 (1889). It does not appear that an appropriate measure of the quantum of damages was ever discussed in either the House or the Senate prior to the enactment of the Sherman Act. *See id. passim*; 21 CONG. REC. *passim* (1890). *See generally* W. THORNTON, A TREATISE ON THE SHERMAN ANTI-TRUST ACT 1-33 (1913); 1 H. TOULMIN, A TREATISE ON THE ANTI-TRUST LAWS OF THE UNITED STATES 1-21 (1949). The same appears to be true for the Clayton Act. Although there was some congressional discussion of remedial measures insofar as they concerned the effectiveness of the Sherman Act, *see, e.g.*, 51 CONG. REC. 15826 (1914), the question of the proper measure of damages was not addressed. *See id. passim*. *See generally* K. ELZINGA & W. BREIT, THE ANTI-TRUST PENALTIES: A STUDY IN LAW AND ECONOMICS 63-77 (1976).

13. *See generally* M. HANDLER, ANTITRUST IN PERSPECTIVE (1957).

14. The case of *Howard v. Stillwell & Bierce Mfg. Co.*, 139 U.S. 199 (1891), was decided one year after the Sherman Act became law. Although *Howard* did not involve an antitrust claim, it exemplified the attitude of the Court toward damages based on lost profits. In *Howard*, which was an action for the price of milling machinery, the Court affirmed a lower court's decision not to recognize as a setoff a claim for profits lost due to a delay in delivery. *Id.* at 207-08. Justice Lamar relied on the traditional rationale that "expected profits are too dependent upon numerous, uncertain and changing contingencies to constitute a definite and trustworthy measure of actual damages . . ." *Id.* at 206. *See also* *Hadley v. Baxendale*, 9 Ex. 341, 156 Eng. Rep. 145 (1854).

antitrust cases. One of the first and probably most widely cited cases¹⁵ illustrating this judicial response is *Central Coal & Coke Co. v. Hartman*,¹⁶ in which the Court of Appeals for the Eighth Circuit refused to award damages based on a lost profits theory because the claim was too speculative.¹⁷ The *Hartman* court required that the evidence of lost profits be sufficient to meet the traditional "reasonable certainty" requirement of the common law:

Facts must be proved, data must be given which form a rational basis for a reasonably correct estimate of the nature of the legal injury and of the amount of the damages which resulted from it, before a judgment of recovery can be lawfully rendered. These are fundamental principles of the law of damages. Now, the anticipated profits of a business are generally so dependent upon numerous and uncertain contingencies that their amount is not susceptible of proof with any reasonable degree of certainty; hence the general rule that the expected profits of a commercial business are too remote, speculative, and uncertain to warrant a judgment for their loss.¹⁸

It is likely that decisions such as *Hartman* seriously retarded the early development of the private antitrust action as a deterrent to anticompetitive activity.¹⁹ The knowledge that one could prove all the elements of an offense and still not recover because of the high degree of certainty required for proving the quantum of damages certainly must have discouraged potential plaintiffs.

Courts responded to this problem in two ways. First, regardless of the type of anticompetitive activity at issue, they relaxed the degree of certainty required for proving damages.²⁰ Second, when the specific activity at issue was price enhance-

15. See, e.g., Clark, *The Treble Damage Bonanza: New Doctrines of Damages in Private Antitrust Suits*, 52 MICH. L. REV. 363, 367 (1954); Donovan & Irvine, *Proof of Damages Under the Anti-Trust Law*, 88 U. PA. L. REV. 511, 513 n.7 (1940); Guilfoil, *supra* note 1, at 647.

16. 111 F. 96 (8th Cir. 1901).

17. *Id.* at 98. Among the cases cited by the *Hartman* court was *Howard v. Stillwell & Bierce Mfg. Co.*, 139 U.S. 199 (1891). See note 14 *supra*.

18. 111 F. at 98. For similar holdings, see *Alexander Milburn Co. v. Union Carbide & Carbon Corp.* 15 F.2d 678, 684 (4th Cir. 1926), *cert. denied*, 273 U.S. 757 (1927); *American Sea Green Slate Co. v. O'Halloran*, 229 F. 77, 79 (2d Cir. 1915); *Locker v. American Tobacco Co.*, 218 F. 447, 450 (2d Cir. 1914); *Loder v. Jayne*, 142 F. 1010, 1019-23 (E.D. Pa. 1906).

19. See Posner, *A Statistical Study of Antitrust Enforcement*, 13 J. L. & ECON. 365, 373-74 (1970). There were only 158 treble damage cases reported in the period 1890-1939, *id.* at 371, and damage awards were made in 33. Guilfoil, *supra* note 1, at 647 n.1. See also Note, *Fifty Years of Sherman Act Enforcement*, 49 YALE L.J. 284, 296-98 (1939).

20. This trend has received considerable attention in the literature. See sources cited in note 15 *supra*; McConnell, *The Treble Damage Action*, 1950 U. ILL. L.F. 659, 664; Weinberg, *Recent Trends in Antitrust Civil Action Damage Determinations*, 1976 DUKE L.J. 485.

ment, courts consistently allowed recoveries based on the gross overcharge²¹ instead of lost profits. The advantage to plaintiffs of using a gross overcharge measure is that it is less speculative and therefore easier to prove than lost profits.²² Both of these developments have been documented in the literature,²³ but it is worthwhile to review them as a prelude to the economic analysis that follows in Part III of this Article.

A. THE DEGREE OF CERTAINTY REQUIRED IN PROVING LOST PROFITS

While it is clear that courts now apply a relaxed standard of proof to lost profits claims in antitrust suits,²⁴ the view of the *Hartman* court prevailed until the mid-1920s. For example, in *Thomsen v. Cayser*,²⁵ reportedly the first antitrust "lost profits" case to reach the Supreme Court,²⁶ the Court approved the

21. See, e.g., *Hanover Shoe v. United Shoe Mach. Corp.*, 392 U.S. 481 (1968); *Bruce's Juices, Inc. v. American Can Co.*, 330 U.S. 743 (1947); *North Tex. Producers Ass'n v. Young*, 308 F.2d 235 (5th Cir. 1962), cert. denied, 372 U.S. 929 (1963); *Union Carbide & Carbon Corp. v. Nisley*, 300 F.2d 561 (10th Cir. 1961), cert. dismissed, 371 U.S. 801 (1962); *Gus Blass Co. v. Elizabeth Arden Sales Corp.*, 150 F.2d 988 (8th Cir.), cert. denied, 326 U.S. 773 (1945); *Ohio Valley Elec. Corp. v. General Elec. Co.*, 244 F. Supp. 914 (S.D.N.Y. 1965); *Philadelphia Elec. Co. v. Westinghouse Elec. Corp.*, 1964 Trade Cas. ¶ 71,123 (E.D. Pa. 1964). See also Guilfoil, *supra* note 1, at 662-65.

22. Allowing plaintiffs to recover damages based on the gross overcharge theory relieves them of a substantial burden of proof, since they need prove only the amount of the overcharge. See L. SULLIVAN, *HANDBOOK OF THE LAW OF ANTITRUST* § 251, at 785 (1977). When a plaintiff proceeds under a loss of net profits theory, he normally must prove from his records the actual profit experienced during the damage period and a basis for estimating what his profit would have been without the violation. See *id.* § 251, at 786. Under the doctrine of *Hartman*, see text accompanying note 18 *supra*, the task of estimating what profits would have been in the absence of anticompetitive conduct was far more difficult than proving the amount of an illegal overcharge. Today, the overcharge method of calculating damages persists even though the doctrine of *Hartman* has been discarded, see text accompanying notes 24-42 *infra*, and courts now give plaintiffs "wide latitude" in proving lost profits. See L. SULLIVAN, *supra*, § 251, at 786-87.

23. See generally sources cited in notes 15, 20 *supra*.

24. See, e.g., *Bigelow v. RKO Radio Pictures, Inc.*, 327 U.S. 251 (1946); *Eastman Kodak Co. v. Southern Photo Materials Co.*, 273 U.S. 359 (1927). See also L. SULLIVAN, *supra* note 22, § 251, at 786-87.

25. 243 U.S. 66 (1917). The defendants in *Thomsen* were shipowners who maintained a practice of returning part of their collusively determined rate to those shippers who dealt exclusively with the rate-fixing group. *Id.* at 69-72. Since the defendants offered service only along the most lucrative routes, shippers were placed in the difficult position of foregoing the shipment of goods to ports not on the defendants' routes or of losing the discounted rate by shipping on other lines.

26. See *Donovan & Irvine*, *supra* note 15, at 518.

trial judge's submission of the damages issue to the jury,²⁷ but appeared to do so because the jury had been given a *Hadley v. Baxendale* instruction—no speculative damages were to be awarded.²⁸ The plaintiffs overcame this burden by tracing their damages to the loss of specific customers.²⁹ The Supreme Court also noted that the plaintiffs' "lost profit" claim was equal to the amount of the defendants' illegal overcharges.³⁰ This factor may have been particularly important because prior to *Thomsen* the Court had responded favorably to the overcharge measure of damages.³¹

Perhaps the first sign that the Court was beginning to change its position on the proof of damages issue came in *Keogh v. Chicago & Northwestern Railway*.³² While the *Keogh* Court observed in dictum that the alleged damages were "purely speculative,"³³ it went on to state a rule that was undoubtedly a departure from *Hartman*. Instead of alluding to the "relative certainty" requirement, Justice Brandeis indicated that damages resulting from anticompetitive activity could be proved "by facts from which their existence is logically and legally inferable."³⁴

However one interprets the language in *Keogh*, a marked relaxation of proof requirements for the quantum of antitrust damages came in 1927 with *Eastman Kodak Co. v. Southern Photo Materials Co.*³⁵ In *Eastman Kodak* several of the facts

27. 243 U.S. at 89.

28. *Id.*

29. *Id.*

30. *Id.*

31. See *Chattanooga Foundry & Pipe Works v. City of Atlanta*, 203 U.S. 390 (1906).

32. 260 U.S. 156 (1922). The defendant rail companies in *Keogh* had agreed to uniform tariffs which were then approved as reasonable and nondiscriminatory by the Interstate Commerce Commission. The issue in the case was whether a manufacturer who shipped with these rail companies could, in a private action for damages under section 7 of the Sherman Act, challenge the rates as conspiratorially fixed. The Court, per Justice Brandeis, held that the injury to business or property required under section 7 implied the violation of a legal right, and that no such violation existed since the shipper's rights against the carrier were defined by the published tariff. *Id.* at 163.

33. *Id.* at 164. At a later point in his opinion, Justice Brandeis, citing *Central Coal & Coke Co. v. Hartman*, 111 F. 96 (8th Cir. 1901), noted that the facts from which damages may be proved "cannot be supplied by conjecture." 260 U.S. at 165.

34. 260 U.S. at 165. This interpretation of *Keogh* is contrary to that presented by another commentator who cites *Keogh* as supporting the traditional rule. See Clark, *supra* note 15, at 370, 389.

35. 273 U.S. 359 (1927). The plaintiff in *Eastman Kodak* was a dealer in photographic supplies who purchased merchandise from Kodak. Prior to 1910, Kodak had acquired most of the plaintiff's competitors and had even attempted

that the Court had found essential for permitting the recovery of "lost profits" in *Thomsen* were missing. First, the lost profits claimed were not traced directly to specific customers.³⁶ Second, the jury had not received a strict *Hadley v. Baxendale* instruction.³⁷ While it had been told that damages could not be determined by "mere speculation or guess," the jury was also instructed that damages could be determined on the basis of evidence "furnishing data from which the amount of probable loss could be ascertained as a matter of reasonable inference."³⁸ Finally, the claim in *Eastman Kodak* was for lost profits, not for the amount of an illegal overcharge.³⁹

In approving the instructions of the trial judge, the *Eastman Kodak* Court reasoned that "a defendant whose wrongful conduct has rendered difficult the ascertainment of the precise damages suffered . . . is not entitled to complain that [the damages] cannot be measured with the same exactness and precision as would otherwise be possible."⁴⁰ The just and reasonable inference standard for measuring lost profits applied by the *Eastman Kodak* Court⁴¹ has retained its vitality and, perhaps, become even more liberal.⁴²

to acquire the plaintiff's business. The plaintiff refused Kodak's offer, and Kodak began charging the plaintiff retail prices instead of prices reflecting a dealer's discount. *Id.* at 368-69.

36. Instead, the plaintiff employed a very general "before and after" damage theory, see text accompanying notes 132-140 *infra*, which set lost profits at a figure equal to the plaintiff's gross profits in the four years preceding the damage period less the additional expenses it had incurred in handling the defendant's goods during the four-year damage period. 273 U.S. at 376.

37. The defendant, citing *Central Coal & Coke Co. v. Hartman*, 111 F. 96 (8th Cir. 1901), argued that plaintiff had not met the reasonable certainty requirement for proving damages. 273 U.S. at 376-77.

38. *Id.* at 379.

39. *Id.* at 369.

40. *Id.* at 379.

41. *Id.*

42. See, e.g., *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100 (1969); *Bigelow v. RKO Radio Pictures, Inc.*, 327 U.S. 251 (1946). In *Bigelow*, the plaintiffs attempted to recover damages alleged to have been caused by the defendant's refusal to allow plaintiffs access to films for first-run exhibition. *Id.* at 253-54. The plaintiffs sought to prove the quantum of damages by contrasting their profits earned prior to the violation to those earned during the violation, *id.* at 258, and also by comparing their profits with those of a similar theatre which had been allowed access to films before the plaintiffs. *Id.* at 257-58. In holding that proof of the quantum of lost profits was sufficient, the Court explained:

[W]here the defendant by his own wrong has prevented a more precise computation, the jury may not render a verdict based on speculation or guesswork. But the jury may make a just and reasonable estimate of the damage based on relevant data

The most elementary conceptions of justice and public policy re-

B. THE "OVERCHARGE" MEASURE OF DAMAGES

Despite the relaxed standard that courts now apply to proof of lost profits, the illegal overcharge measure of damages is still used in price-fixing and other price enhancement cases. As already noted,⁴³ an allegation of overcharge damages substantially alleviates the problems of proof that had plagued early private enforcement efforts in which lost profits were alleged. One commentator has suggested that the overcharge measure was the product of imaginative pleading necessitated by cases such as *Hartman*.⁴⁴ While this may be true in price enhancement cases involving refusals to deal,⁴⁵ it seems more likely that the measure evolved from the common law claim for money had and received.⁴⁶

Regardless of its origin, the use of illegal overcharge as the measure of damages in price enhancement cases was established early. The Supreme Court first applied the overcharge measure of damages in *Chattanooga Foundry & Pipe Works v. City of Atlanta*.⁴⁷ While *Chattanooga Foundry* has been cited as the case in which the Court initially rejected the pass-on defense,⁴⁸ it actually appears merely to have fixed a stamp of approval on a measure of damages that equals "the difference

quire that the wrongdoer shall bear the risk of the uncertainty which his own wrong has created.

Id. at 264-65. In addition to relaxing the standard for proving the quantum of damages, courts have relaxed the standards for proving causation and the "fact" of damage. See Weinberg, *supra* note 20, at 488-95.

43. See note 22 and text accompanying note 21 *supra*.

44. See Guilfoil, *supra* note 1, at 648.

45. See text accompanying notes 57-60 *infra*.

46. Price enhancement cases seem to be divided into two categories. The first is comprised of disputes between parties who have entered into anticompetitive agreements. While the common law attitude toward these agreements was not entirely clear, see generally Peppin, *Price-Fixing Agreements Under the Sherman Anti-Trust Law*, 28 CALIF. L. REV. 297 (1940), such agreements were frequently held unenforceable. See, e.g., *Santa Clara Valley Mill & Lumber Co. v. Hayes*, 76 Cal. 387, 18 P. 391 (1888); *Craft v. McConoughy*, 79 Ill. 346 (1875); *Gibbs v. Smith*, 115 Mass. 592 (1874); *Arnot v. Pittston & Elmira Coal Co.*, 68 N.Y. 558 (1877); *Central Ohio Salt Co. v. Guthrie*, 35 Ohio St. 666 (1880); *Morris Run Coal Co. v. Barclay Coal Co.*, 68 Pa. 173 (1871). The second category includes cases resembling private antitrust actions in which one party to the agreement has filed suit for money had and received in connection with an overcharge. In these cases, however, the issue was whether the parties' entry into the price-enhancing contract was voluntary, rather than whether the price-enhancing activity itself was legal. See, e.g., *Radich v. Hutchins*, 95 U.S. 210 (1877); *Dennehy v. McNulta*, 86 F. 825 (7th Cir. 1898); *Emery v. City of Lowell*, 127 Mass. 138 (1879); *Custin v. City of Viroqua*, 67 Wis. 314, 30 N.W. 515 (1886).

47. 203 U.S. 390 (1906).

48. See L. SULLIVAN, *supra* note 22, § 252, at 788. See also *Hanover Shoe, Inc. v. United Shoe Mach. Corp.*, 392 U.S. 481, 489-90, 490 & n.8 (1968).

between the price paid and the market or fair price."⁴⁹ Thus, even though ascertainment of market price is not free from difficulty,⁵⁰ victims of price-fixing agreements found the proof of damages problem far less threatening after *Chattanooga Foundry* since they did not have to prove lost profits.

Because of the peculiar facts in *Chattanooga Foundry*, however, it is obvious that the Court's acceptance of the overcharge measure was based on necessity, and the case can hardly be interpreted as proscribing the use of a lost profits measure in all price enhancement cases. The plaintiff in *Chattanooga Foundry* was a municipal public utility engaged in selling and distributing water to the residents of Atlanta.⁵¹ Because certain iron pipe producers had formed a cartel, the city of Atlanta could purchase pipes for its waterworks only at inflated prices.⁵² The municipality passed on the entire amount of this overcharge to its customers by incorporating it into the rate base upon which water charges were computed.⁵³ Since the municipality had not purchased the pipe for resale and was acting as a public utility, it could not use the pipe in any venture for profit.⁵⁴ Obviously, a damage theory based on lost profits would have been inappropriate. Furthermore, the alleged overcharge was in fact an accurate measure of compensatory damages since it was equal to the amount by which the customers of the utility were injured in their "property."⁵⁵

It is therefore an overgeneralization to say that *Chattanooga Foundry* established the overcharge as the only correct measure of damages in price enhancement cases. Unlike *Chattanooga Foundry*, many price enhancement cases involve plaintiffs whose sole purpose in purchasing the illegally priced good is to process and resell it at a profit. In such cases, the theoretically correct measure of compensatory damages is lost profits since this measure is based on the actual injury sustained by the plaintiff. When the plaintiff is in business for profit, the overcharge measure is not truly compensatory;

49. 203 U.S. at 396.

50. See C. BANE, *THE ELECTRICAL EQUIPMENT CONSPIRACIES* 47-62 (1973); Guilfoil, *supra* note 1, at 652.

51. See *City of Atlanta v. Chattanooga Foundry & Pipeworks*, 127 F. 23, 25 (6th Cir. 1903), *aff'd*, 203 U.S. 390 (1906).

52. 203 U.S. at 395-96.

53. See L. SULLIVAN, *supra* note 22, § 252, at 788.

54. See 127 F. at 25.

55. See note 10 *supra*. Of course, one could argue that the consumers in *Chattanooga Foundry* were damaged by an amount in excess of the overcharge because of the "diminished volume" effect. See pp. 770-72 *infra*.

rather, it represents the amount by which the defendant was unjustly enriched.

One might expect that in the pre-*Eastman Kodak* era⁵⁶ the quantum of damages issue would have been a serious barrier to recovery in all but *Chattanooga Foundry*-type, pure price-fixing cases. This did not prove to be so. Plaintiffs avoided the problem by defining damages, when possible, in terms of price differentials rather than lost profits. Such an approach was taken in *Straus v. Victor Talking Machine Co.*,⁵⁷ a case involving a refusal to deal. Two aspects of *Straus* are particularly noteworthy. First, in order to avoid the risk of nonrecovery, the plaintiff sued for the price differential rather than lost profits.⁵⁸ The court recognized the proof of damages problem and deemed the overcharge measure a permissible method of avoiding it.⁵⁹ Second, the court was aware of the imprecision of the price differential measure but viewed it as resulting from the necessity of finding "some way in which damages can be awarded where a wrong has been done."⁶⁰ It should be noted that in *Straus* a legal or reasonable purchase price was easily ascertainable, since it was the price currently paid by favored customers.⁶¹

A variation of the price differential versus lost profits theme appears in cases in which conspirators, attempting to drive a competitor from the market, fix prices below those that would have existed in the absence of the conspiracy. In *Story Parchment Co. v. Paterson Parchment Paper Co.*,⁶² the plaintiff, at the court of appeals level, relied primarily on *Straus* to support the proposition that it need not show lost profits to recover damages.⁶³ As in *Straus*, the plaintiff's objective was to avoid the risk of nonrecovery that would arise if it were forced to prove lost profits. The damages issue in *Story Parchment* was,

56. *Eastman Kodak* is discussed in text accompanying notes 35-42 *supra*.

57. 297 F. 791 (2d Cir. 1924). In *Straus* the plaintiff refused to participate in the defendant's newly instituted distribution system and therefore was not permitted to purchase merchandise at a price reflecting the usual dealer's discount. The plaintiff continued to deal in the defendant's merchandise, but was forced to obtain it at retail prices. *Id.* at 795. The court calculated damages as the difference between retail price and the price that would have been charged if the dealer had cooperated. *See id.* at 800-04.

58. *Id.* at 802-03.

59. *Id.* at 803.

60. *Id.* at 802.

61. *See id.* at 803.

62. 37 F.2d 537 (1st Cir. 1930), *rev'd*, 282 U.S. 555 (1931). Commentaries on *Story Parchment* can be found in Clark, *supra* note 15, at 372-77; Donovan & Irvine, *supra* note 15, at 515-16.

63. 37 F.2d at 539-40.

as the court pointed out, quite different from that in *Straus*; in *Straus* the price at which merchandise could have been purchased by the plaintiff in the absence of the refusal to deal was ascertainable by reference to the price paid by favored customers. In *Story Parchment*, however, the price at which the plaintiff's merchandise could have been sold in the absence of the pricing conspiracy was dictated by competitive forces. The court reasoned that the actual price would depend on how aggressively the defendants would have competed in the absence of the conspiracy, and that it possibly would have been no higher than the conspiratorially determined price.⁶⁴ Thus, while the court deemed price differential the appropriate measure of recovery in some cases, it regarded its use here as too speculative.⁶⁵

The Supreme Court reversed,⁶⁶ upholding the district court's submission of the damage issue to the jury. The Court indicated that there was sufficient evidence to allow a determination of what the nonconspiratorial price of the good would have been.⁶⁷ Of particular interest is the Court's reliance on *Eastman Kodak*—a lost profits case.⁶⁸ Not only was the plaintiff in *Story Parchment* permitted to use the generally easier-to-prove price differential measure of damages, but it was further benefited by the Court's *Eastman Kodak*-like reasoning that while "damages may not be determined by mere speculation or guess, it will be enough if the evidence show the extent of the damages as a matter of just and reasonable inference."⁶⁹ It seems reasonable to have expected the Court to reach the opposite result. If, as is clearly implied by *Straus* and *Story Parchment*, the price differential measure of overcharge was created to avoid the difficult problem of proving lost profits, *Eastman Kodak* alone would seem to have made any additional accommodation unnecessary.

The most serious challenge to the gross overcharge measure of damages came in the 1968 case of *Hanover Shoe, Inc. v. United Shoe Machinery Corp.*⁷⁰ in which the illegal overcharge resulted from United Shoe's policy of leasing machinery rather

64. *Id.* at 540-41.

65. *Id.* at 541.

66. 282 U.S. 556, 568 (1931).

67. *Id.* at 562.

68. *Id.* at 653. *Eastman Kodak* is discussed in text accompanying notes 35-42 *supra*.

69. 282 U.S. at 563.

70. 392 U.S. 481 (1968).

than making it available for purchase.⁷¹ The damages issue was whether the defendant should be held liable for the full amount of the overcharge even though the plaintiff had passed on a portion of the overcharge to its own customers.⁷² In short, were the charges passed through to remote purchasers damages sustained by the plaintiff under section 4 of the Clayton Act?⁷³

The Court rejected the pass-on defense and, in the interest of disgorging the illegally obtained revenues, held the defendant liable for the full amount of the overcharge.⁷⁴ Although *Hanover Shoe* has been the subject of thorough analysis elsewhere,⁷⁵ two important aspects of the decision warrant additional attention. First, the overriding thrust of the Court's holding is one of practicality.⁷⁶ The Court felt that allowing the pass-on defense would open the door to "long and complicated proceedings involving massive evidence and complicated theories."⁷⁷ Second, it is not clear that in rejecting the pass-on defense the Court necessarily rejected a pure "lost profits" theory of recovery.

There is in fact considerable support for the position that the Court, despite its desire to disgorge the fruits of the illegal activity, recognized lost profits as the theoretically correct measure of damages. For example, the Court conceded that a pass-on defense may be appropriate in cases in which the "victim" was selling on the basis of a preexisting cost-plus contract⁷⁸ and noted that it may be necessary to require proof of lost profits in cases in which the plaintiff is unable to prove a difference between an unlawful price and a price required by law.⁷⁹ Similarly, the Court in *Hanover Shoe* seems implicitly to have acknowledged that the use of the overcharge measure of

71. Plaintiff in *Hanover Shoe* successfully argued that the findings, opinion, and decree in an earlier civil case brought by the government against United Shoe, see *United States v. United Shoe Mach. Corp.*, 100 F. Supp. 295 (D. Mass. 1953), *aff'd*, 347 U.S. 521 (1954), constituted prima facie evidence of United Shoe's illegal, monopolizing practices. See 392 U.S. at 484-87.

72. 392 U.S. at 487-88.

73. See *id.* at 487-89 (quoting Clayton Act, § 4, 15 U.S.C. § 15 (1976)). Section 4 of the Clayton Act appears in note 11 *supra*.

74. 392 U.S. at 494.

75. See, e.g., L. SULLIVAN, *supra* note 22, § 252, at 789-91; Schaefer, *supra* note 5; Watson, *supra* note 6; Weinberg, *supra* note 20, at 500-06.

76. See L. SULLIVAN, *supra* note 22, § 252, at 790.

77. 392 U.S. at 493.

78. *Id.* at 494.

79. *Id.*

damages is merely an accommodation to the difficulties of proving lost profits:

If in the face of the overcharge the buyer does nothing and absorbs the loss, he is entitled to treble damages. This much seems conceded. The reason is that he has paid more than he should and his property has been illegally diminished, *for had the price paid been lower his profits would have been higher*. . . . As long as the seller continues to charge the illegal price, he takes from the buyer more than the law allows. At whatever price the buyer sells, *the price he pays the seller remains illegally high, and his profits would be greater were his costs lower*.⁸⁰

From this, it is reasonable to infer that the underlying concern of the Court was the impact of the overcharge on profits. The Court may not have been convinced that a simplistic comparison of profits—for example, those occurring before and after a conspiracy⁸¹—would detect actual losses because of the failure of this method to account for the influence of the many other variables affecting profits during these periods. Finally, the Court's concern with the difficulty of determining both the costs of production and the impact of price on volume indicates that it regarded the lost profits determination as technically impractical, but not necessarily theoretically inappropriate.⁸²

This is to say nothing more than that the Court's reasoning in *Hanover Shoe* does not seem to foreclose the use of lost profits as an appropriate measure of damages in price enhancement cases. On the other hand, it should be noted that the legal precedents⁸³ and policy arguments⁸⁴ relied on by the Court in rejecting the pass-on defense do not support even the theoretical appropriateness of the lost profits measure. In addition, the Court hinted that it was actually rejecting the very no-

80. *Id.* at 489 (emphasis added).

81. For a discussion of the "before and after" method, see text accompanying notes 132-140 *infra*.

82. See 392 U.S. at 492-93.

83. The Court in *Hanover Shoe* relied primarily on *Chattanooga Foundry & Pipe Works v. City of Atlanta*, 203 U.S. 390 (1906), see text accompanying notes 47-55 *supra*, and *South Pac. Co. v. Darnell-Taenzler Lumber Co.*, 245 U.S. 531 (1918), for support in disallowing the pass-on defense. See 392 U.S. at 489, 490 & n.8. In *Darnell-Taenzler*, the plaintiff-shipper sought to recover the amount of an overcharge associated with a rate found to be excessive by the Interstate Commerce Commission. 245 U.S. at 533. The issue was whether the defendants could use the pass-on defense. The Court, speaking through Justice Holmes, did not permit the defense, reasoning that "[t]he general tendency of the law, in regard to damages at least, is not to go beyond the first step." *Id.* See also *Hanover Shoe, Inc. v. United Shoe Mach. Corp.*, 392 U.S. 481, 489-90, 490 & n.8 (1968).

84. The Court reasoned that permitting the pass-on defense would reduce the deterrent effect of treble-damage actions since it would diffuse and thereby reduce the incentive to bring private suits. 392 U.S. at 494.

tion that damages should be apportioned among various layers of buyers and sellers.⁸⁵ This interpretation is bolstered by the Court's subsequent opinion in *Illinois Brick Co. v. Illinois*⁸⁶ in which the Court discussed at length the difficulties of allocating an overcharge fund among direct and indirect purchasers.⁸⁷ As will be shown in the following section, apportioning the overcharge is quite different from awarding lost profits. Yet, to the extent that the apportionment process has been rejected by the Court, it would be inappropriate to infer that the lost profits measure has received even implicit approval.

While the Supreme Court's view of the theory of lost profits as a remedy in price enhancement cases is less than clear, there is no doubt that the illegal overcharge measure is highly imprecise. Moreover, the development of advanced statistical techniques⁸⁸ and the relaxation of the standard for proving the quantum of lost profits renders far less compelling the practical considerations that courts have relied on to support their choice of the overcharge measure. It is to these matters that the following material is directed.

III. ECONOMIC ANALYSIS OF PRICE-FIXING REMEDIES

A. THE GROSS OVERCHARGE AND PASS-ON ADJUSTED OVERCHARGE REMEDIES

The microeconomic model most frequently used⁸⁹ to illustrate the gross overcharge phenomenon is one that treats the increase in cost resulting from anticompetitive activity as an excise tax.⁹⁰ This model can be used to determine not only the total amount of the overcharge, but also the portion of the overcharge that has been passed on by the direct purchaser to indirect purchasers.⁹¹ The model can also be used to predict the impact of a price change on the level of the direct purchaser's

85. *Id.*

86. 431 U.S. 720 (1977).

87. *Id.* at 740-41, 745. This aspect of the *Illinois Brick* decision is discussed at text accompanying notes 125-127 *infra*.

88. Multivariate regression analysis is one such technique. See text accompanying notes 152-169 *infra*.

89. See R. POSNER, ANTITRUST 147-49 (1974); Cirace, *supra* note 5, at 179, 180 & n.53, 181 & n.53, 182 & n.55, 183; Schaefer, *supra* note 5, at 887-97.

90. An excise tax is a tax paid by a commodity seller and is administered on a per unit or value of the commodity basis. B. DAVIE & B. DUNCOMBE, PUBLIC FINANCE 121 (1972).

91. For a discussion of the basic excise tax models from which this analysis of price enhancement is drawn, see *id.* at 122-26; C. FERGUSON & S. MAURICE, ECONOMIC ANALYSIS: THEORY AND APPLICATION 68-70, 372-73 (3d ed. 1978).

output, and can be adapted to situations in which the good is sold in either a perfectly or imperfectly competitive market.

1. *Perfectly Competitive Market*

Figure I illustrates the case in which a good, after being purchased from the manufacturer, is resold in a perfectly competitive market. The firms that buy and resell the good are referred to as intermediate firms. The good is an intermediate good when passed from the manufacturer to the intermediate firms and a final good when sold by the intermediate firms. Ignoring D_2 for the moment, equilibrium quantity and price for the final good are determined by the intersection of D_1 and S_1 , the demand and supply curves. The impact of an increase in cost to the intermediate firms brought on by an increase in price charged by the manufacturer for the intermediate good is represented by a vertical shift of the supply curve equal to the amount of the price increase.⁹²

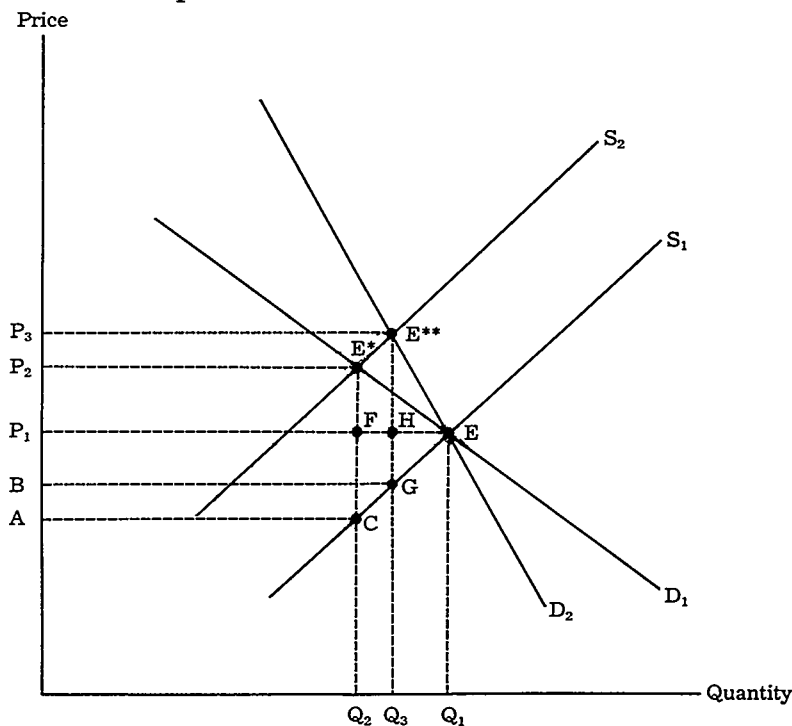


Figure I

92. In the short run, the supply curve in a perfectly competitive market is equal to the horizontal summation of the marginal cost curves of all the firms

In Figure I, S_2 is the supply curve after the price of the intermediate good has been increased by an amount equal to the difference between P_2 and A measured along the vertical axis. The impact of this change on the price and quantity of the final good is illustrated by their movement to a new equilibrium position: E^* . Equilibrium price has increased from P_1 to P_2 . Thus, while cost to the intermediate firms has increased by the amount P_2 minus A , they have passed on a portion of this increase in the form of a higher price for the final good.⁹³ Despite this partial pass on, the intermediate purchasers as plaintiffs would be entitled to damages equal to the increase in price times the quantity purchased after the price increase. In Figure I, this would equal area AP_2E^*C . The amount of the "damages" that have been passed on to indirect purchasers would equal $P_1P_2E^*F$ ⁹⁴ and the overcharge actually absorbed by the intermediate firms would equal AP_1FC .⁹⁵

Figure I also illustrates that the portion of the gross overcharge which is passed on varies according to the elasticity⁹⁶ of

in the industry. Marginal cost is the change in total cost associated with the production of one additional unit. Thus, regardless of the level of output, an excise tax raises marginal cost by the amount of the tax.

93. A simple mathematical example illustrates this phenomenon. Assume that the demand curve is $P = 20 - .5Q$, and that supply curve S_1 is $P = 5 + .5Q$. Solving the equations simultaneously, the equilibrium price is \$12.50, and the quantity produced is 15 units. If cost to the intermediate firm is increased by \$1.00 per unit, the new supply curve, S_2 , is $P = 6 + .5Q$. The new equilibrium price is \$13.00, and quantity has dropped to 14 units. Thus, only half of the cost increase to the intermediate firm, \$50 per unit, has been passed on in the form of a higher price for the final good; the remainder has been absorbed by the intermediate firm.

94. This area equals the price increase multiplied by the quantity sold after the impact of the price enhancement has been felt.

95. This is the difference between areas AP_2E^*C and $P_1P_2E^*F$. The portion of the total price increase passed on to consumers is equal to $(P_2 - P_1)/(P_2 - A)$.

96. Elasticity can be defined as the percentage change in any dependent variable divided by the corresponding percentage change in the relevant independent variable. The resulting ratio indicates the responsiveness of the dependent variable to changes in the independent variable. See E. BRIGHAM & J. PAPPAS, *MANAGERIAL ECONOMICS* 103-06 (2d ed. 1976). In other words, elasticity of demand equals the percentage change in quantity demanded divided by the percentage change in price. Elasticity of supply equals the percentage change in quantity supplied divided by the percentage change in price. For a description of the details of these calculations, see C. FERGUSON & S. MAURICE, *supra* note 91, at 20-30. Technically, one cannot ascertain the elasticity of most demand or supply curves by mere inspection. The slopes of the curves can be used, however, as indicators of their relative elasticities. In Figure I, the slope

the supply and demand curves. If demand were D_2 instead of D_1 , the increase in cost of the intermediate good—although the same as in case D_1 —would have caused the price of the final good to increase to P_3 instead of P_2 . Thus, with the more inelastic demand curve, the cost increase is passed on to a greater degree.

This second example reveals another problem with the remedial scheme. The intermediate firms facing demand D_2 will experience a greater gross overcharge and therefore recover more than their D_1 counterparts.⁹⁷ The total overcharge—the price increase to the intermediate firms multiplied by the quantity purchased—will be equal to $BP_3E^{**}G$. Although the price increase to the intermediate firms is the same as in the D_1 case,⁹⁸ volume has not declined as much because D_2 is more inelastic.⁹⁹ In the D_2 case, the amount of the price increase passed on is equal to $P_1P_3E^{**}H$, while the overcharge absorbed by the intermediate firms is BP_1HG . A comparison of the two cases indicates that a greater portion of the overcharge is passed on in the case of the intermediate firms facing demand D_2 .¹⁰⁰ In short, if those purchasing from the intermediate firms have relatively inelastic demand functions, the intermediate firms as plaintiffs can not only prove greater damages, but can

of D_2 is steeper than D_1 , indicating that purchasers are less responsive to changes in price in case D_2 than they are in case D_1 .

97. Because the price increase exacted by the manufacturer is the same in the D_2 case as in the D_1 case, it may at first seem anomalous that the D_2 overcharge, which measures the amount by which the manufacturer has been unjustly enriched, is different from the D_1 overcharge. These results are consistent, however, since the overcharge is a function not only of the price differential, but also of the volume purchased at the enhanced price. In this model, the volume of the intermediate good purchased at the enhanced price will vary according to the elasticity of demand for the final good facing the intermediate purchaser. See note 99 *infra*. Thus, a price increase by a manufacturer could result in a variety of degrees of unjust enrichment depending on the elasticities of demand facing the intermediate firm.

98. The price enhancement in the D_2 case— P_3 minus B —is identical to that in the D_1 case— P_2 minus A —because both result in the same vertical shift of S_1 to a new, parallel supply function, S_2 .

99. In D_1 , volume declined by the quantity $(Q_1 - Q_2)$, while in D_2 , volume declined only by the quantity $(Q_1 - Q_3)$.

100. Although this result is not necessarily clear from Figure I, it can be demonstrated by assigning values to the various points on the vertical and horizontal axes. Assume the following values: $P_3 = \$100$, $P_2 = \$80$, $P_1 = \$60$, $B = \$50$, $A = \$30$, $Q_3 = 30$ units, $Q_2 = 20$ units, and $Q_1 = 40$ units. Then

Gross Overcharge:

$$D_1 = 20 (\$80 - \$30) = \$1000$$

$$D_2 = 30 (\$100 - \$50) = \$1500$$

Pass On:

$$D_1 = 20 (\$80 - \$60) = \$400$$

$$D_2 = 30 (\$100 - \$60) = \$1200$$

pass on a higher percentage of these damages to their customers.

2. Imperfectly Competitive Market

The excise tax model can also be used to illustrate the impact of a cost increase on a firm reselling in an imperfectly competitive market.¹⁰¹ Although the outcome is much the same as in a perfectly competitive market, this model is included because of its more realistic assumptions concerning market conditions and because it introduces the cost curves that are necessary for determining the actual damage sustained by the intermediate firm. In Figure II, MC_1 is the marginal cost curve of the intermediate firm prior to the anticompetitive activity at the manufacturing level and MR is the intermediate firm's marginal revenue curve.¹⁰² The profit-maximizing level of output occurs at the intersection of MC_1 and MR . The profit-maximizing price is the price that corresponds to this level of output on the demand curve. Thus, profit is maximized at price P_1 and quantity Q_1 .

The increase in price due to anticompetitive behavior at the manufacturing level is reflected as a vertical shift in the intermediate firm's marginal cost curve¹⁰³ corresponding to the amount of the price increase of the intermediate good. In Figure II, MC_2 is the marginal cost curve of the intermediate firm after an anticompetitive price increase at the manufacturing level. The new profit-maximizing level of output is Q_2 , and the profit-maximizing price has increased to P_2 . Thus the increase in price to the intermediate firm has been partially passed on through an increase in price of the final good.

Based on this model, the gross overcharge is equal to the increase in cost— C_2 minus C_1 —multiplied by the new volume

Proportion of Gross Overcharge Passed On:

$$D_1 = 400/1000 = 40\%$$

$$D_2 = 1200/1500 = 80\%$$

101. See B. DAVIE & B. DUNCOMBE, *supra* note 90, at 124-25.

102. Marginal revenue (MR) is the increase in total revenue derived from the sale of one additional unit of output. Marginal cost (MC) is the increase in total cost resulting from the production of one additional unit of output. A profit-maximizing firm will expand production so long as MR is greater than MC , stopping only when MR equals MC . For an explanation of the basic microeconomic theory involved in determining the profit-maximizing output and price, see C. FERGUSON & S. MAURICE, *supra* note 91, at 338-42.

103. This analysis applies if the cost increase is for a good that is processed and resold to consumers. If the increase is in the cost of a capital good, however, the curve will not shift as indicated, but the general conclusions flowing from this analysis remain the same.

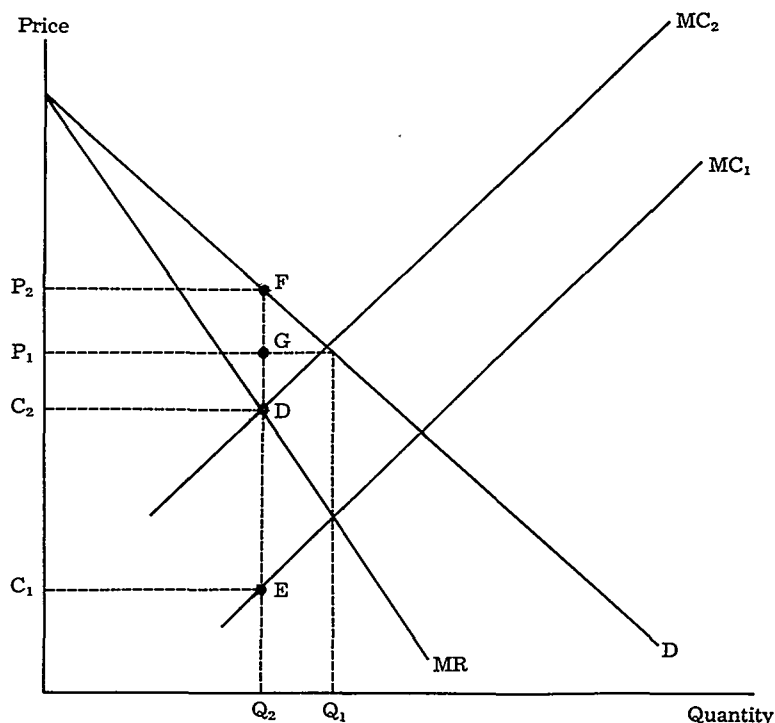


Figure II

of the final good; it is represented by area C_1C_2DE . The amount passed on is equal to the price increase of the final good— P_2 minus P_1 —multiplied by the new volume; it is represented by area P_1P_2FG . As in the perfectly competitive model, the proportion of the pass on will vary according to elasticity of demand and the responsiveness of marginal cost to changes in volume.

B. THE VOLUME ADJUSTED OVERCHARGE REMEDY

The preceding discussion points out the imprecision of the currently used method of calculating damages in price enhancement cases. Much of this imprecision is due to the pass-on phenomenon. An additional and perhaps equally important problem, at least in terms of supporting the lost profits measure, is that the gross overcharge measure ignores the impact

that the enhanced price has had on the volume of the final good eventually produced.

Figure III, which illustrates this problem, shows the demand of an intermediate firm or firms for an intermediate good. Where P_1 is the competitive price and P_2 the illegally enhanced price, the price enhancement has caused the intermediate firm's volume to drop from Q_1 to Q_2 . The gross overcharge, if calculated according to the currently used method, would be equal to area P_1P_2AB . The problem with this measure of damages, however, is that it does not reflect the losses associated with the diminution in volume caused by the anticompetitive behavior. An alternative solution, multiplying the price differential by the volume originally demanded, would result in a gross overcharge equal to area P_1P_2CF . This method is also unsatisfactory because it significantly overstates the actual amount of the manufacturer's unjust enrichment.

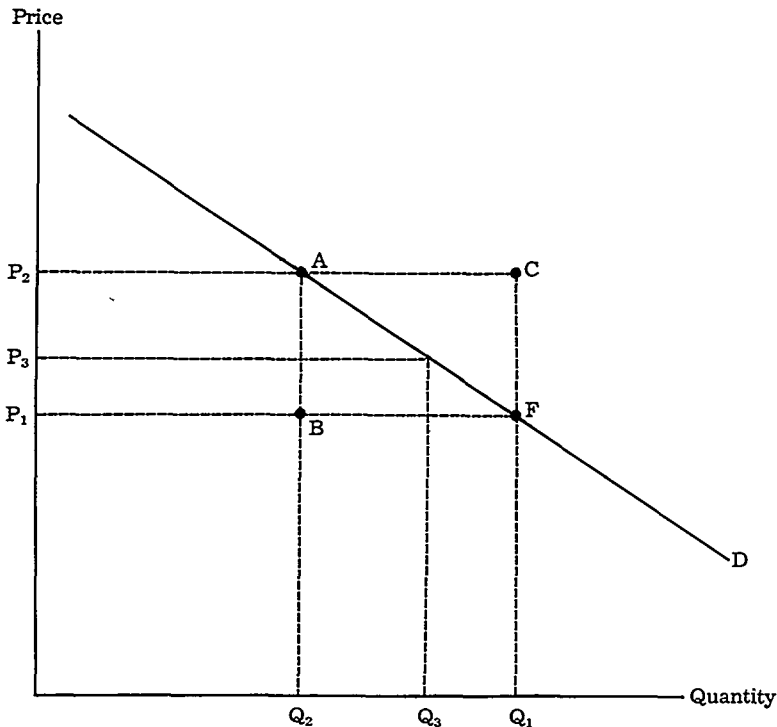


Figure III

Solving the diminished volume problem requires that the lost surplus of the intermediate firm be taken into account. An intermediate firm will continue to purchase goods from a manufacturer so long as, after the good is processed at the intermediate level, its sale will contribute a surplus toward fixed costs and profit.¹⁰⁴ Thus, at the illegally enhanced price of P_2 , the intermediate firm will purchase Q_2 units from the manufacturer, since each of the units contributes to the producer's surplus. The enhanced price has simply eliminated that portion of the producer's surplus—represented by area P_1P_2AB —that would have existed had the units been purchased at the competitive price of P_1 . It is not true, however, that area $BACF$ represents the sum of the differences between the competitive price, P_1 , and the highest price at which the intermediate firm would be willing to purchase each unit.¹⁰⁵ For example, the intermediate firm would become indifferent to buying unit Q_3 at any price greater than P_3 . If Q_3 were purchased at the competitive price of P_1 , its contribution to producer's surplus would be equal to P_3 minus P_1 . Thus, the diminution of volume brought on by the illegal price enhancement would result in an additional loss of producer surplus equal to triangle ABF .

In short, the overcharge area P_1P_2AB is the lost surplus on the units still purchased. Area ABF is the surplus associated with the units that are no longer purchased. One could argue that consistency requires a recovery equal to both losses—area P_1P_2AF . This would not, however, solve the pass-on problem discussed earlier.¹⁰⁶ The measure that eliminates both the pass-on and diminished volume problems is lost profits.¹⁰⁷

C. THE LOST PROFITS REMEDY

The lost profits model is based on the economics of transfer pricing¹⁰⁸ and vertical integration.¹⁰⁹ It includes elements from

104. This surplus is called "producer's surplus". See A. MARSHALL, PRINCIPLES OF ECONOMICS 810-11 n.2, 830-32 (8th ed. 1920). The term "surplus" or "producer's surplus" is used frequently throughout the remainder of this Article. Since this surplus is a contribution to both fixed cost and profit, any change in this surplus will manifest itself as some change in profit.

105. The highest price a firm is willing to pay for a particular unit is represented by the demand curve for the intermediate good. See text accompanying note 112 *infra*.

106. The overcharge and lost surplus measures are analogous, since both represent contributions to fixed costs and profit which the intermediate firm no longer earns.

107. See text accompanying notes 116-118 *supra*.

108. Transfer pricing refers to the method for setting a price on a good that is transferred between divisions of a firm that are treated as profit centers. See

all three levels of the production chain that stretches from manufacturer to intermediate producer to ultimate consumer. In Figure IV, D_f is the demand of consumers for the final good.¹¹⁰ It is the demand facing the intermediate producer. From D_f , the marginal revenue resulting from the sale of the final good, MR_f , can be derived. This marginal revenue function can in turn be used to derive the demand of the intermediate firm for the intermediate good.¹¹¹ Since the demand curve shows the highest price that individuals are willing to pay for a good at a variety of output levels,¹¹² the intermediate firm's demand for units of the intermediate good can be derived by subtracting the firm's marginal cost of processing the unit from the marginal revenue generated by its sale in final form. For example, if the marginal cost of processing a unit at the intermediate level is eight dollars, and the marginal revenue generated by its sale as a final good is ten dollars, the intermediate firm would be willing to pay up to two dollars for the unit. At any price lower than two dollars, the processing and resale of the good would generate a surplus that will contribute to fixed costs and profit. In other words, the intermediate firm will continue to purchase goods from the manufacturer so long as when the cost of processing a good at the intermediate level (MC_f) is subtracted from the marginal revenue generated by the sale of the final good (MR_f), there still remains enough to pay the price of the intermediate good.¹¹³

E. BRIGHAM & J. PAPPAS, *supra* note 96, at 364-74; Hirshleifer, *On The Economics of Transfer Pricing*, 1956 J. BUS., July, at 172.

109. See E. SINGER, *ANTITRUST ECONOMICS* 206-211 (1968).

110. D_f slopes downward, indicating that the final good is sold in an imperfectly competitive market. If the final good were sold in a perfectly competitive market, D_f would be a horizontal line. Assumptions about the nature of the market for the final good do not, however, alter this analysis.

111. The intermediate good could be anything from a raw material to a finished good sold to a retailer. If it is a capital good, the analysis will vary from the one presented here, but the conclusions should be the same.

112. This definition of demand is simply the converse of the traditional "quantity perspective" definition. See C. McCONNELL, *ECONOMICS* 59-60 (6th ed. 1975).

113. If the price of an intermediate good (P_I) equals MR_f minus MC_f , the firm will be indifferent to the purchase of that particular unit. This result simply expresses the profit-maximizing condition that MR equals MC , because the last possible unit produced will be when $P_I = MR_f - MC_f$. Adding MC_f to both sides of this equation results in: $P_I + MC_f = MR_f$. Since the total marginal cost (MC) of the firm is actually the sum of the marginal cost of the processing undertaken by the intermediate firm (MC_f) plus the cost of obtaining the intermediate good (P_I), $MC = P_I + MC_f$ and $MC = MR_f$.

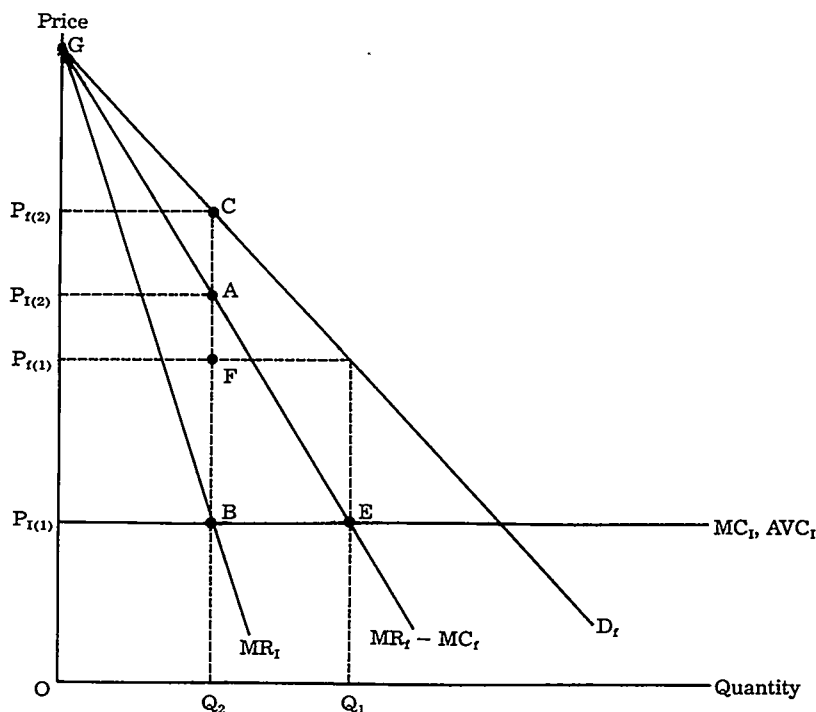


Figure IV

In Figure IV, the manufacturer is faced with an intermediate firm's demand curve, labelled MR_f minus MC_f . The line MC_I, AVC_I represents the marginal and average variable costs of the manufacturer. They are assumed to be equal in order to simplify the presentation. In a competitive market, the manufacturers would sell Q_1 units to the intermediate firm at a price of $P_{I(1)}$.¹¹⁴ The final good would be sold at $P_{f(1)}$, and this would result in a producer's surplus represented by the triangle $P_{I(1)}GE$.¹¹⁵ If, however, there is monopolistic pricing at the manufacturing level, the number of units purchased by the in-

114. In this case the marginal cost curve is the supply curve of the manufacturer. In order to simplify the presentation, the intermediate firm is assumed to be a monopolist that does not possess monopsony power in purchasing intermediate goods.

115. For any unit Q , the $MR_f - MC_f$ curve indicates the amount remaining after the marginal cost generated by the intermediate firm has been subtracted from the marginal revenue associated with the sale of the unit as a final good. Subtracting the cost of the intermediate good from this amount leaves the surplus which that unit contributes to fixed cost and overhead. The area $P_{I(1)}GE$ is therefore the sum of the producer's surpluses associated with the sale of Q_1 units.

intermediate firm will no longer be determined by the intersection of demand— MR_t minus MC_t —with line MC_1 , AVC_1 . Rather, the quantity will drop to Q_2 where the manufacturer's marginal revenue curve, MR_t , intersects line MC_1 , AVC_1 . The profit-maximizing price charged by the manufacturer for its intermediate good will therefore rise to $P_{I(2)}$.

Based on the gross overcharge measure, damages would equal the area $P_{I(1)}P_{I(2)}AB$. Part of this overcharge, of course, would be passed on to consumers in the form of a price increase of the final good from $P_{f(1)}$ to $P_{f(2)}$. The amount of the pass-on would equal area $P_{f(1)}P_{f(2)}CF$, and the actual overcharge absorbed by the intermediate firm would equal $P_{I(1)}P_{I(2)}AB$ minus $P_{f(1)}P_{f(2)}CF$. This pass-on adjustment, however, does not consider the impact of the overcharge on the intermediate firm's volume. The reduction of volume from Q_1 to Q_2 will eliminate the producer's surplus that was associated with those units that are no longer produced. This loss of surplus is equal to area BAE .¹¹⁶

A true measure of damages should not include that portion of the overcharge that is passed on to subsequent purchasers, but should include the lost surplus associated with the intermediate firm's diminished volume. This is in fact the measure of damages that results when one focuses on the producer's surplus remaining after the price increase. The total surplus before the monopolistic pricing was area $P_{I(1)}GE$, but afterward the surplus had been reduced to area $P_{I(2)}GA$. The difference between areas $P_{I(1)}GE$ and $P_{I(2)}GA$ is therefore the actual damage resulting from the illegal price increase.

While Figure IV is useful in isolating the different effects of the price increase as well as in illustrating the relationship between the manufacturer and intermediate purchaser, the actual lost surplus, or profit contribution,¹¹⁷ can more easily be identified using the basic microeconomic model for a firm operating in an imperfectly competitive market.¹¹⁸ In Figure V, line MC_1 , AVC_1 represents the marginal and average variable costs prior

116. See generally text accompanying notes 104-105 *supra*.

117. Profit contribution is the difference between price and average variable cost on a per unit basis. E. BRIGHAM & J. PAPPAS, *supra* note 96, at 268. Since Figure V includes average variable cost, it is convenient to shift from the lost surplus to the profit contribution concept for the following analysis. In Figure V the profit contribution is equal to the sum of the differences between the marginal revenue and marginal cost of each unit that is sold. Since these differences will be the contribution of the units to fixed costs and profit, the sum of these differences is equal to the total profit contribution.

118. See, e.g., C. FERGUSON & S. MAURICE, *supra* note 91, at 338-42.

to the illegal activity. The profit-maximizing quantity—where MR equals MC_1 —is Q_1 ; the profit-maximizing price is P_1 . Total revenue is equal to price times quantity, represented by area OP_1AQ_1 . Total variable cost is equal to AVC_1 at Q_1 multiplied by Q_1 , or area OC_1BQ_1 . The difference between total revenue and total variable variable cost is the profit contribution and is equal to area C_1P_1AB .

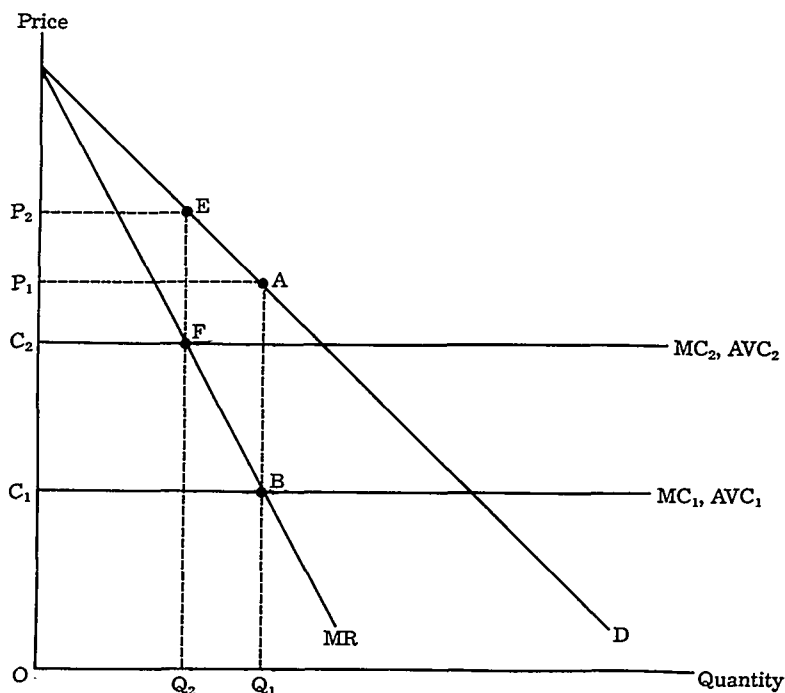


Figure V

A price increase would shift the marginal and average variable costs curve to a higher level represented by line MC_2 , AVC_2 . The new profit-maximizing level of output would be Q_2 , and the new price P_2 . The intermediate firm's total revenue is now area OP_2EQ_2 , and its total variable costs equal area OC_2FQ_2 . Area C_2P_2EF is therefore the new level of profit contribution. The difference between area C_1P_1AB —the level of profit contribution before the illegal price enhancement—and C_2P_2EF —the new level of profit contribution—would be the lost

profit sustained by the intermediate firm and, therefore, its actual loss.

D. SUMMARY: THE APPROPRIATENESS OF THE LOST PROFITS REMEDY AFTER *ILLINOIS BRICK*

Nine years after rejecting the pass-on defense,¹¹⁹ the Supreme Court, in *Illinois Brick Co. v. Illinois*,¹²⁰ rejected the notion that the pass-on theory can be used offensively by indirect purchasers to prove that they have been injured by the anticompetitive activity of a remote producer.¹²¹ The *Illinois Brick* decision seems absolutely to foreclose the possibility of indirect-purchaser standing in price enhancement suits.¹²² It should be noted, however, that *Illinois Brick* dealt with a claim for a portion of an overcharge fund, not a claim for lost profits. As the preceding analysis has illustrated, there is a vast difference between an accurate lost profits measure and the pass-on adjusted overcharge measure. Lost profits is a compensatory measure and is determined by the individual plaintiff's demand and cost functions. The pass-on adjustment, on the other hand, is designed to impart some compensatory aspect to a theory of damages—disgorging unjust enrichment—that is largely unrelated to that end.

The Court in *Illinois Brick* was aware of the tension between the goals of disgorgement and compensation,¹²³ and chose to subordinate compensation, in its pass-on adjustment form, to disgorgement. The reasons given by the Court, however, do not in strict logic require the conclusion that indirect purchasers can never be compensated.¹²⁴ The Court was reluctant to allow indirect-purchaser standing without overruling *Hanover Shoe* because of the risk of multiple liability for a sin-

119. See *Hanover Shoe, Inc. v. United Shoe Mach. Corp.*, 392 U.S. 481, 488 (1968), discussed in text accompanying notes 70-87 *supra*.

120. 431 U.S. 720 (1977).

121. *Id.* at 735.

122. This appears to be the view of the majority in *Illinois Brick*. See *id.* at 746.

123. See *id.* The Court conceded that allowing offensive pass-on recoveries might be a step toward more compensatory awards, but expressed doubts that the amount of a pass-on recovery "would reflect the actual injury suffered." *Id.* at 746-47.

124. In addition to the compulsory joinder and diminished deterrence problems cited by the Court, see *id.* at 737-38, 745, the majority in *Illinois Brick* felt that the reasoning of the Court in *Hanover Shoe, Inc. v. United Shoe Mach. Corp.*, 392 U.S. 481 (1968), militated against the offensive pass-on theory as well. See 431 U.S. at 746.

gle violation.¹²⁵ The Court found the alternative of overruling *Hanover Shoe* and allowing offensive use of the pass on equally unattractive because it would (1) require compulsory joinder of every potential plaintiff at each level of the distribution chain¹²⁶ and (2) diminish the deterrent effect of the threat of private enforcement by spreading the overcharge fund among many plaintiffs instead of awarding it to one.¹²⁷

The striking aspect of the lost profits remedy is that its use would eliminate the risk of multiple liability¹²⁸ and would permit the overruling of *Hanover Shoe* without creating the problems the Court was trying to avoid in that case. The difference is due to the fact that the lost profits measure is not premised on the assumption that an indirect purchaser's damages are a fraction of a common fund. Thus, the compulsory joinder problem disappears; no other potential plaintiffs could reasonably claim an interest in the lost profits of the plaintiff bringing suit. Similarly, the lost profits measure is unlikely to diminish the effectiveness of private enforcement. First, the number of potential individual or class plaintiffs would increase substantially. Second, the aggregate of the potential lost profits claims would be difficult for the violating firm or firms to anticipate and it could exceed the amount of the illegal overcharge.¹²⁹

It appears therefore that the Supreme Court's rejection of indirect purchaser standing is due in large part to the adherence of courts to the overcharge measure of damages. If lost

125. 431 U.S. at 730. The Court was not concerned so much that more than one party would recover damages as it was that the defendant might be forced to make duplicative payments of an amount that, as a matter of law, was the full measure of the damages it had inflicted by its anticompetitive activity.

126. *Id.* at 737-38.

127. *Id.* at 745.

128. The plaintiff who recovers the total amount of an overcharge fund has received a windfall by recovering certain damages sustained not by him, but by other potential plaintiffs. The essence of the multiple liability problem in the overcharge context is that the defendant may have to pay damages to one plaintiff when he has already paid those damages once before as a windfall to another plaintiff. Under the lost profits scheme of damages, each recovery against a defendant would reflect only those damages the defendant's anticompetitive activity had caused the recovering plaintiff. Since no plaintiff would reap windfall damages, the defendant would not be exposed to multiple liability.

129. The historical justification for overcharge damages was that without it, because of the difficulty of proving lost profits, antitrust violators might escape liability for their acts. See text accompanying notes 43-46 *supra*. Since, however, the aggregate lost profits claims of a chain of direct and indirect purchasers could exceed an overcharge claim, a modern argument for overcharge damages might be that it provides a logical upper limit on the defendant's potential liability. In this sense, the overcharge measure would serve a purpose similar to the proximate cause requirement imposed in negligence cases.

profits were to replace illegal overcharge as the proper measure of damages in price enhancement cases, the barriers to indirect-purchaser standing cited by the Court in *Illinois Brick* would no longer exist. In addition, the compensatory effect resulting from the use of the lost profits measure is far more accurate than that which results from the use of the offensive pass-on theory. With this in mind, the various methods of applying the lost profits measure in price enhancement cases are examined in the next section.

IV. MODELS FOR MEASURING LOST PROFITS

A. THE TRADITIONAL MODELS

It is of little importance that lost profits is a more accurate measure of the damages resulting from illegal price enhancement if the amount of lost profit is unascertainable or highly speculative.¹³⁰ It is particularly difficult to show lost profits, for example, when the plaintiff, by making adjustments in other areas of its operations, or because of external economic influences, has maintained or steadily increased profits in spite of anticompetitive activity.¹³¹ Equally difficult is the case in which a firm's profits have declined during the period of the violation, but for reasons other than the violation. Economists and lawyers have, however, developed a number of methods of approximating the amount of lost profits even in these difficult cases.

1. *Before and After Method*

The oldest¹³² damage calculation approach is called the "before and after" method.¹³³ As its name implies, the remedy involves a comparison of a firm's profits before the violation with its profits during the period of the violation. It apparently was fashioned after early contract remedies,¹³⁴ with its initial antitrust application in *Central Coal & Coke Co. v. Hartman*.¹³⁵

130. See text accompanying notes 35-39 *supra*.

131. See *Hanover Shoe, Inc. v. United Shoe Mach. Corp.*, 392 U.S. 481, 492-93 (1968).

132. See Hoyt, Dahl & Gibson, *supra* note 5, at 1233.

133. See E. TIMBERLAKE, *supra* note 5, at 317-28; Hoyt, Dahl & Gibson, *supra* note 5, at 1233-36; Parker, *Measuring Damages in Federal Treble Damage Actions*, *supra* note 5, at 501-09.

134. See T. SEDGWICK, *A TREATISE ON THE MEASURE OF DAMAGES* §§ 182, 183, at 264-68 (8th ed. 1891), cited in Hoyt, Dahl & Gibson, *supra* note 5, at 1233 n. 7.

135. 111 F. 96, 99 (8th Cir. 1901) (dictum). See Parker, *Measuring Damages in Federal Treble Damage Actions*, *supra* note 5, at 503.

The before-and-after label is somewhat misleading, since it actually is unnecessary for the "before" and "after" periods to occur in any particular sequence.¹³⁶ All that is necessary is that some normative period, whether before or after the violation period—or even between two violation periods—can be identified and compared with the period of the violation.¹³⁷

Four conditions must exist before courts will permit application of this measure of damages:

- (a) The plaintiff's business must be one which was established and operating prior to the impact of the conspiracy; (b) the prior earnings must have been reasonably uniform; (c) the earnings during both periods must be in the same line of commerce; and (d) the earnings during the prior period may not have been made when plaintiff was a participant in or beneficiary of the unlawful acts of defendant.¹³⁸

The relative importance of each of these conditions has been the subject of some discussion, and it appears that a rigid application of the first two conditions is of limited utility.¹³⁹ In addition, an oversimplified application of the before-and-after approach¹⁴⁰ will not accurately detect damages if factors influencing the firm's profits other than the anticompetitive activity are constantly changing.

2. Yardstick Method

Another approach to lost profits calculation, the "yardstick" method,¹⁴¹ involves interfirm profit comparisons. Although this method is frequently employed¹⁴² and has received implicit Supreme Court approval,¹⁴³ its use is subject to severe limitations. Ideally, the yardstick firm must not only be in the same line of commerce as the plaintiff firm, but should duplicate both the market share and the cost and demand conditions that the plaintiff firm would have experienced in the absence of an-

136. See Parker, *Measuring Damages in Federal Treble Damage Actions*, *supra* note 5, at 505-06.

137. *Id.*

138. E. TIMBERLAKE, *supra* note 5, at 321.

139. Parker, *Measuring Damages in Federal Treble Damage Actions*, *supra* note 5, at 505-07.

140. An oversimplified version of this method would be the comparison of before and after profits with no attempt to adjust for variations in other factors that might have had an impact on profits.

141. See E. TIMBERLAKE, *supra* note 5, at 328-33.

142. See cases cited in *id.*, at 328-32.

143. *Bigelow v. RKO Radio Pictures, Inc.*, 327 U.S. 251, 257-60 (1946). In *Bigelow*, both the before-and-after and the yardstick methods were employed. From the language of the decision, however, it is difficult to ascertain the attitude of the Court toward the yardstick method. See Parker, *Measuring Damages in Federal Treble Damage Actions*, *supra* note 5, at 509-10.

ticompetitive activity.¹⁴⁴ It is particularly difficult to identify a firm conforming to these requirements if the anticompetitive activity has had an industry-wide effect,¹⁴⁵ or if the only firms escaping damage are those involved in the conspiratorial activity.¹⁴⁶

3. *Market Share Method*

The most recently developed approach to lost profits calculation is the "market share" method.¹⁴⁷ This measure evolved in response to the inadequacy of the before-and-after and yardstick methods in cases in which the plaintiff was partially or totally excluded from a market.¹⁴⁸ In such cases, it is difficult to identify a relevant normative period or to locate a satisfactory yardstick firm.

Using this approach, one calculates damages by subtracting the plaintiff's actual market share from the share it would have achieved but for the anticompetitive conduct and multiplying this difference by total market sales. This produces an estimate of lost sales which is then multiplied by the plaintiff's average net profit.¹⁴⁹ In *Zenith Radio Corp. v. Hazeltine Research, Inc.*,¹⁵⁰ this methodology was employed to calculate the past lost profits of a firm that had expected to increase its market share but was unable to do so because of anticompetitive activity. The model can be adapted, however, for use in situations in which a firm has lost a portion of its share of the market or in which future profits will be lost due to market share damage.¹⁵¹

B. THE REGRESSION MODEL

As noted earlier, the lost profits theory is not especially useful unless the plaintiff's actual loss can be ascertained or evidence exists from which its magnitude can be reasonably in-

144. See Hoyt, Dahl & Gibson, *supra* note 5, at 1237-39.

145. For example, a firm that was not a victim of the price-fixing activity may have been able to increase its prices (and its profits) because of the "umbrella" effect created when the victim firm was forced to raise its prices or experience lower profits. In such a situation, the non-victim firm is a poor yardstick of what the victim firm's profits would have been in the absence of price fixing.

146. E. TIMBERLAKE, *supra* note 5, at 332.

147. See generally Gibbons, *supra* note 5.

148. See *id.* at 743-45.

149. See *id.* at 749.

150. 401 U.S. 321 (1971). See generally Gibbons, *supra* note 5, at 748-50; Hoyt, Dahl & Gibson, *supra* note 5, at 1241-47.

151. See Hoyt, Dahl & Gibson, *supra* note 5, at 1243-56.

ferred.¹⁵² An accurate calculation of lost profits requires that several variables, all of which have an independent effect on profit, be identified and estimated. Once this separation of variables has been accomplished, the specific effect that the anticompetitive activity has had on profits can be isolated. The identification of these independent variables, of course, must be based on sound economic theory. Economists have developed a statistical modelling technique called regression analysis,¹⁵³ which enables them to estimate the extent of the independent effect these variables have on a dependent variable such as profit. The application of regression analysis to legal and policy issues is not particularly novel.¹⁵⁴ The following discussion is designed to describe the rationale of regression analysis and to illustrate its particular suitability for estimating the lost profits resulting from illegal price enhancement.

In order to isolate the independent factors that affect profits, an economist would first attempt to identify as many variables as possible that might influence the level of the firm's profits. A simple computer program can reduce the relationship between these "independent" variables and profit (the "dependent" variable) to an equation called a regression equation. Figure VI illustrates a simple case in which only one independent variable—advertising expenditures—is used to "explain" profits. The firm's annual profits are plotted along the Y axis, and its advertising expenditures for the corresponding years are plotted along the X axis.¹⁵⁵ A line that summarizes the general relationship between the two variables can be drawn through the points. When the line is fitted mathematically rather than by hand, it is done by minimizing the sum of the squared differences between the line and the actual observations.¹⁵⁶ In Figure VI, the equation could be:

152. See text accompanying notes 35-42 *supra*.

153. See generally E. BRIGHAM & J. PAPPAS, *supra* note 96, at 137-55; J. MURPHY, *INTRODUCTORY ECONOMETRICS*, 31-354 (1973).

154. See generally Benham, *The Effect of Advertising on the Price of Eyeglasses*, 15 J.L. & ECON. 337 (1972); Beller, *The Economics of Enforcement of an Antidiscrimination Law: Title VII of the Civil Rights Act of 1964*, 21 J.L. & ECON. 359 (1978); Finkelstein, *Regression Models in Administrative Proceedings*, 86 HARV. L. REV. 1442 (1973); Landes, *An Economic Study of U.S. Aircraft Hijacking, 1961-1976*, 21 J.L. & ECON. 1 (1978); Landes & Posner, *Legal Precedent: A Theoretical and Empirical Analysis*, 19 J.L. & ECON. 249 (1976); Parker, *Economics in the Courtroom: Proof of Damages in a Price-Fixing Case*, *supra* note 5.

155. This example is based on a similar example presented in E. BRIGHAM & J. PAPPAS, *supra* note 96, at 141-42.

156. The differences are squared because some of them will be negative and

$$P_t = 10 + .5A_t$$

where:

P_t = profit in year t

A_t = advertising expenditures in year t .

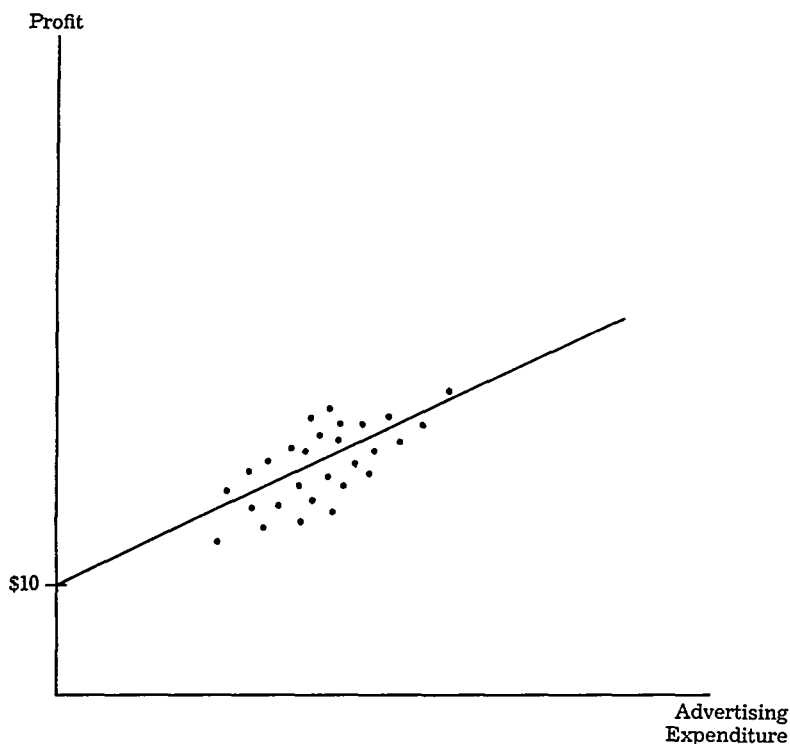


Figure VI

The equation indicates that there will be a constant¹⁵⁷ level of profit of ten dollars when there are no advertising expenditures, and that profit will increase by fifty cents for each additional dollar of advertising.

When several independent variables are used to explain variation in a dependent variable, the graphical presentation

some positive. The process of squaring produces all positive numbers so that they do not offset each other when totaled.

157. The constant term does little more than "position" the equation on the Y axis. If an equation is developed from data that did not include zero values for the independent variables, the constant term alone should not be relied on for predictive purposes. See E. BRIGHAM & J. PAPPAS, *supra* note 96, at 144.

loses its usefulness, but the method of least squares can still be used to fit a line that expresses the relationship between these variables.

For example, a regression analysis of how several independent variables affect profit could produce an expression similar to this: $P_t = a + bY_t - cM_t - dF_t + u$

where:

P_t = profit in year t

Y_t = national income in year t

M_t = an index representing the cost of materials in year t ¹⁵⁸

F_t = a dummy variable¹⁵⁹ which has the value of 0 if there is no price fixing in year t and the value of 1 if there is price fixing in year t

u = the residual effects of factors not included among the independent variables.¹⁶⁰

When actual data for several years are available, values can be estimated for the constant term, a , and for the coefficients b , c , and d . The coefficients are estimates of the magnitude and direction of each independent variable's influence on the de-

158. This index, of course, is not a variable that simply can be gleaned from some published source as can the national income variable. Rather, the index would be created by the economist constructing the regression model.

159. The model, as presented, makes use of what is called a "dummy" variable to code for the existence or absence of price fixing. See J. MURPHY, *supra* note 153, at 253. In a more complex regression model, a variable representing the actual fixed price might be used instead of a "dummy" variable.

160. Although the equation as presented may be a reliable predictor of future profits, it is designed merely to summarize the factors influencing profits already earned. The Y term is used to summarize factors affecting demand; M represents factors affecting supply. Both demand and supply, however, could be represented by a more complex set of factors. For example, instead of Y , one could use some measure of regional income, advertising expenditures, and/or variables describing demographic characteristics of the market.

The model might be improved by using more than a single equation. The use of a single equation involves the assumption that the values of the independent variables are determined exogenously. See E. BRIGHAM & J. PAPPAS, *supra* note 96, at 536-39. A simple two-equation model could include one equation for demand and one equation for supply, see J. MURPHY, *supra* note 153, at 451-70, with both equations being solved simultaneously. As the model becomes more complex, it begins to simulate the actual decisionmaking behavior of the firm.

It should also be noted that the equation presented in the text is linear in form. In order to use the linear form, one must assume that the magnitude of the influence of each independent variable is not affected by the values of the other independent variables. When there is this type of interdependence between variables, a nonlinear model will more accurately describe the relationship between the dependent and the independent variables.

pendent variable. Suppose that the following equation were derived:

$$P_t = 100 + .1Y_t - 10M_t - 1000F_t.$$

This equation indicates that national income has a positive influence on profit, while the cost of materials and the existence of price fixing both have negative influences. The estimated magnitudes of these influences are indicated by the coefficients.

The equation is of little use, however, without certain additional information indicating the confidence that may be placed in the model. One important measure is the coefficient of determination, usually called R^2 . The R^2 figure indicates what percentage of the observed variation in the dependent variable (here profit) is explained by the variation of the independent variables included in the equation.¹⁶¹ The higher the R^2 , the better the equation is for explaining the variation in profit from year to year.

An additional confidence measure is the standard error of the estimate (SEE). If predicted values for all the independent variables in year t were substituted into the equation to calculate a predicted profit level for year t , the SEE would supply the information necessary to construct a confidence interval around the predicted profit figure. For example, assume the predicted profit is \$20,000 and the SEE is \$1,000. While \$20,000 may not turn out to be the actual profit, there is a 68% probability that the actual profit will fall between $\$20,000 \pm \$1,000$, a 95% probability that the actual profit will fall between $\$20,000 \pm \$2,000$, and a 99% probability that the actual profit will fall between $\$20,000 \pm \$3,000$.¹⁶²

In addition to the standard error of the estimate, each coefficient (in our case the values for b , c , and d) has a standard error which is a measure of the coefficient's reliability. Assume that the standard error for the national income coefficient is .02. Thus, while .1 is only an estimated value for the coefficient,

161. R^2 is the ratio of the amount of variation explained by the regression equation to the total observed variation in the dependent variable. For example, an R^2 of 1.0 indicates that all observed variation can be explained by the regression equation, while an R^2 of 0.5 indicates that fifty percent of the total observed variation can be explained by the regression model. For a more detailed explanation of the R^2 statistic, see E. BRIGHAM & J. PAPPAS, *supra* note 96, at 145-48.

162. Standard error, as used here, connotes the same meaning as standard deviation from the mean. The confidence intervals described in the text therefore rest on the assumption that the errors are normally distributed about the mean value. See generally *id.* at 148-49.

there is a 68% probability that the actual coefficient is $.1 \pm .02$, a 95% probability that its actual value is $.1 \pm .04$, and a 99% probability that the actual value is $.1 \pm .06$. Obviously, the smaller the standard error of the coefficient, the more confidence one can place in the magnitude of the estimated coefficient. The standard error of the coefficient also indicates how confident one can be as to the direction of the influence of a particular variable.¹⁶³

Suppose the values in our hypothetical equation were generated using actual data for twenty periods, ten prior to the price-fixing violation and ten during the violation. The model could be used, through a type of "before and after" simulation, to predict what profit would have been during the violation period if the price fixing had not taken place. This computation could be done for any particular year by substituting the actual values for Y and M into the equation and assigning the price-fixing dummy variable a value of zero to denote the absence of price fixing.¹⁶⁴ The difference between this predicted profit level and the one that results when the equation is used to predict profit using the true value of 1 for the price-fixing dummy variable would be the estimated lost profit for that particular year.¹⁶⁵ The confidence one would place in this lost profit estimate depends on the R^2 , the SEE, and the standard error of the price-fixing coefficient.¹⁶⁶

This example is certainly not intended to imply that a per-

163. Suppose the standard error for the national income coefficient is .04. Can one reject at a 99% level of confidence the hypothesis that national income has a negative as opposed to positive influence on profit? The 99% confidence interval would be $.1 \pm .12$, covering the range of values from $-.02$ to $.22$. Thus, one could not be 99% certain that the national income coefficient in our model is evidence of a positive correlation between national income and the hypothetical firm's profits. See generally *id.* at 149-50.

164. In the formulation presented in the text, all factors can be held constant and the effect of price fixing isolated simply by removing the effect of the dummy variable. In a more detailed model, see note 160 *supra*, the simulation might be accomplished by substituting an estimated competitive price for the collusive price variable.

165. One could also add the predicted profit for a particular year to the error for the year and subtract this from the actual profit for the year. The result would be the same as that yielded by the procedure described in the text.

166. The standard error of the price-fixing coefficient is of particular importance. In our model, the estimated lost profits will always equal \$1000. This is because the "dummy" variable can take only the values 0 or 1, depending respectively on the absence or presence of price fixing. A more complex model would not, of course, be bound to such a consistent predictive pattern. If the standard error of our price-fixing coefficient were \$200, there would be a 68% probability that actual losses were between \$800 and \$1200, a 95% probability that they were between \$600 and \$1400, and a 99% probability that they were between \$400 and \$1600.

fect regression equation for calculating lost profits will always be available. Sometimes, due to a low R^2 , a high SEE, or a high standard error for the price-fixing coefficient, it may not be possible to place a great deal of confidence in this type of analysis.¹⁶⁷ Likewise, the use of regression analysis requires one to make certain assumptions that are not always entirely accurate.¹⁶⁸ Regression analysis remains, however, a useful method of isolating the impact of anticompetitive activity on profit, and the results can be presented in an understandable form.¹⁶⁹ In price enhancement cases, this method is clearly capable of generating lost profit estimates that would allow a jury to decide the quantum of damages issue on the basis of a reasonable inference.

V. CONCLUSION

The remedial scheme currently used by courts in price enhancement suits does little to match recoveries with the incidence of overcharge-induced losses. To the extent that antitrust recoveries should compensate victims, the overcharge remedial scheme is inadequate. The pass-on adjustment, even if coupled with standing for indirect purchasers, does not relieve this inadequacy, since damages are still calculated as a function of the defendant's unjust enrichment rather than the plaintiff's actual losses. Furthermore, the pass-on adjustment ignores the damages resulting from the decline in volume associated with an overcharge. Lost profits is the only measure that reflects actual damages including the losses associated with diminished volume.

In terms of antitrust objectives, however, the goal of deterring anticompetitive activity is equally important as, if not more important than, victim compensation. It has been argued that to allow the pass-on defense and indirect-purchaser standing would limit the deterrent effect of treble-damage actions.¹⁷⁰ The same criticism can be leveled against the lost profits rem-

167. Economists generally experiment with several formulations before finding the model that seems best to fit the data.

168. As noted earlier, the assumptions made in order to use the model presented here are that 1) the values of all the independent variables are exogenously determined and 2) the change in one variable is unaffected by the level of the other variables. In addition, construction of the confidence intervals as described involves the assumption that the errors are normally distributed.

169. The results can be reported as predicted values with confidence intervals.

170. See, e.g., Handler, *supra* note 6, at 1424-27.

edy,¹⁷¹ but it loses much of its force once the critical differences between the pass-on adjusted overcharge and lost profits remedies are recognized. The pass-on remedy is premised on the existence of an overcharge fund of predetermined magnitude, which must be apportioned among all potential plaintiffs in a vertical distribution or production chain. Under the lost profits approach, the proof of damages issue does not entail claiming a portion of a fixed overcharge fund. Thus, the proof of lost profits by any plaintiff or class of plaintiffs would be completely independent of the proof of damages by plaintiffs at other levels in the vertical chain. In addition, the aggregate lost profits claim of the direct and indirect purchasers would be difficult for a violator to predict and could far exceed the amount of the gross overcharge. The lost profits remedy therefore has significant deterrent potential while it also makes sense from the standpoint of compensation.

This lost profits proposal is offered as a solution to the remedial problems that will surely arise if *Hanover Shoe* and *Illinois Brick* are overruled by Congressional action. Notwithstanding the possibility of Congressional action, however, the materials presented here suggest both a rationale and a damage calculation methodology upon which the Supreme Court might base a reconsideration of its holdings in these cases. The Court's reliance on the gross overcharge measure is the key to the *Hanover Shoe-Illinois Brick* problem. The measure is inconsistent with the goal of compensation and is not necessarily the most advantageous form of deterrence. Continued reliance on the overcharge measure should be based on its practical superiority. But the availability of sophisticated statistical tools and the evolution of the "reasonable inference" standard of proof for lost profits indicate that the practical superiority of the overcharge remedy may be more imaginary than real. Thus, the lost profits remedy not only is appealing from the standpoint of economic theory, it also represents a practical alternative to a seriously defective method of assessing antitrust damages.

171. See R. POSNER, *supra* note 89, at 149. It is not completely clear whether Professor Posner is criticizing the lost profits or pass-on adjusted overcharge remedy. While he uses the term "lost profit," he combines it with an overcharge recovery at the indirect purchaser level.