

THE POTENTIAL ROLE OF CIVIL ANTITRUST DAMAGE ANALYSIS IN DETERMINING FINANCIAL PENALTIES IN CRIMINAL ANTITRUST CASES

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INTRODUCTION

Economists are frequently asked to estimate damages to consumers in civil antitrust cases¹ by identifying and quantifying the impact of a violation on the volume and dollar value of sales of the products at issue while taking into account other market influences.² Courts have generally found economic analysis of damages in such cases can be done with reasonable accuracy and reliability and can be relatively straightforward.³ Despite their wide acceptance by civil courts, economic damage analyses have not historically played an important role in sentencing in criminal antitrust cases, which until 2005 relied solely upon the basic factors identified in the United States Sentencing Guidelines (the “USSG”) to estimate financial penalties for defendants.⁴ However, *United States v. Booker*⁵ and subsequent cases have

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¹ See, e.g., ABA SECTION OF ANTITRUST LAW, PROVING ANTITRUST DAMAGES: LEGAL AND ECONOMIC ISSUES 280-81 (2d ed. 2010) [hereinafter PROVING ANTITRUST DAMAGES] (describing damage testimony provided by the plaintiff’s economic expert in *Rose Confections, Inc. v. Ambrosia Chocolate Co.*, 816 F.3d 381 (8th Cir. 1987)).

² See *id.* at 53-54 (noting that the damage analysis “should isolate the effect of the violation on the plaintiff from the effects of all other events”).

³ See *id.* at 57-58 (discussing the two common methodologies for proving damages in civil antitrust actions); Paul E. Godek & Janusz A. Ordovery, *Economic Analysis in Antitrust Class Certification: Hydrogen Peroxide*, ANTITRUST, Fall 2009, at 62, 63 (“The job of economic experts in damages analysis is well known to antitrust practitioners, in particular in price-fixing cases. Determining whether average prices in a certain market over a certain period of time exceeded expected levels is, at least in theory, a straightforward exercise.”); cf. *Bigelow v. RKO Radio Pictures, Inc.*, 327 U.S. 251, 257-60 (1946) (finding that plaintiffs may establish damages by calculating the difference between their profits before and during the conspiracy or by comparing their profits during the conspiracy to the profits of a competitor not hurt by the violation).

⁴ U.S. SENTENCING GUIDELINES MANUAL § 2R1.1(d)(1) & cmt. n.3 (2010). *But see* *United States v. Booker*, 543 U.S. 220, 227 (2005) (5-4 decision) (invalidating statutory provisions that made the USSG mandatory).

⁵ 543 U.S. 220 (2005).

made clear that the USSG are not mandatory,⁶ so determining the volume of commerce (“VOC”) affected by a criminal antitrust violation could now involve the causation analysis and quantification of a cartel’s impact that is familiar from civil cases.⁷

Economists have developed damage estimation techniques that the courts have accepted as evidence in civil trials⁸ and that can provide more accurate estimates of the affected VOC than the USSG’s approach.⁹ However, economic damage analyses are more rigorous than the mechanical calculations set forth by the USSG.¹⁰ Accordingly, courts must choose between the relatively low administrative costs of using the USSG’s simple formula for estimating criminal penalties¹¹ and the higher cost and potential delays of using more accurate VOC calculations.¹²

From a benefit-cost perspective, the degree to which economic damage analyses will provide more accurate estimates of the VOC is a key consideration in deciding whether to use those calculations in criminal antitrust cases. Generally, the more rigorous analyses will provide substantially more accurate estimates when the potential VOC is relatively large, there is uncertainty concerning the actual VOC affected by the violation, and the economist has sufficient reliable data and other information to implement damage estimation techniques effectively.¹³

Part I below briefly reviews some of the approaches historically used by courts and federal regulators in determining the appropriate level of financial penalties in criminal antitrust cases in the United States. Part I continues by discussing federal cases that suggest economic analyses of financial penalties may find an expanded role for estimating harm to consumers in criminal antitrust cases. Part II discusses the types of analyses economists commonly use to estimate damages in civil antitrust cases, which may be employed to estimate financial penalty calculations in criminal antitrust cases. Part III addresses the advantages and disadvantages of using the USSG’s simpler approach for estimating the VOC compared to the more

⁶ See, e.g., *Oregon v. Ice*, 129 S. Ct. 711, 716 (2009) (characterizing the USSG as “then-mandatory” after *Booker*); *Rita v. United States*, 551 U.S. 338, 350 (2007) (noting that post-*Booker*, courts are free to impose a sentence other than that set forth in the USSG).

⁷ See James H. Mutchnik et al., *The Volume of Commerce Enigma*, THE ANTITRUST SOURCE, June 2008, at 1, 1 & n.5, 6-7.

⁸ See, e.g., *LePage’s Inc. v. 3M*, 324 F.3d 141, 164-66 (3d Cir. 2003) (upholding the trial court’s decision to admit testimony of plaintiff’s economic expert regarding damages); *Conwood Co. v. U.S. Tobacco Co.*, 290 F.3d 768, 780, 795 (6th Cir. 2002) (affirming the district court’s decision to accept economic expert’s testimony as evidence of damages).

⁹ See *infra* Part III (describing how economic damage analyses applied in civil cases result in a more accurate measure for the VOC than the method set forth by the USSG).

¹⁰ See discussion *infra* Part II.A-B.

¹¹ U.S. SENTENCING GUIDELINES MANUAL § 2R1.1 cmt. n.3 (2010).

¹² See *infra* Part III.

¹³ See *infra* Part III.B.

complex, but potentially more accurate, economic damage analyses used in many civil antitrust cases.

I. FINANCIAL PENALTIES IN CRIMINAL ANTITRUST CASES

Financial penalties in U.S. criminal antitrust cases¹⁴ have historically been driven by two factors: the maximum allowable fine levels under the Sherman Act and related legal codes¹⁵ and the USSG.¹⁶ The current maximum fine under the Sherman Act is \$100 million.¹⁷ However, the Antitrust Division of the U.S. Department of Justice has been able to collect fines in excess of this amount in recent years¹⁸ by relying on an alternative fine provision in the statute that allows the Division to assess fines up to “twice the gross gain or twice the gross loss” from the alleged conspiracy.¹⁹

The USSG provides a framework of simple calculations for determining fines,²⁰ beginning by setting the base-fine level for criminal antitrust cases at 20 percent of the VOC.²¹ The sentencing court then adjusts this base-fine level using a multiplier based on a “culpability score.”²² The culpability score is determined using various factors such as a company’s level of cooperation with the investigation, the involvement of executives in the alleged conspiracy, and the company’s history of antitrust violations.²³ If a company cooperates with enforcers, its fine may be lowered;²⁴ if the company is a repeat offender, the opposite will be true.²⁵

¹⁴ An increasing number of criminal antitrust cases involve international cartels. *See* Mutchnik et al., *supra* note 7, at 2 (“[I]nternational cartel investigations account for over 40% of the [Department of Justice Antitrust] Division’s grand jury investigations.” (quoting Scott D. Hammond, Deputy Assistant Att’y Gen. for Criminal Enforcement, U.S. Dep’t of Justice, Antitrust Div., Recent Developments, Trends, and Milestones in the Antitrust Division’s Criminal Enforcement Program, Speech Before the ABA Section of Antitrust Law’s 56th Annual Spring Meeting 17 (Mar. 26, 2008), available at <http://www.justice.gov/atr/public/speeches/232716.pdf>) (internal quotation marks omitted)). However, the scope of Mutchnik’s article is limited to conspiracies that are prosecuted within the United States.

¹⁵ 15 U.S.C. §§ 1-2 (2006); 18 U.S.C. § 3571(d) (2006).

¹⁶ U.S. SENTENCING GUIDELINES MANUAL § 8C2.7(b).

¹⁷ 15 U.S.C. § 1 (“Every person who shall make any contract or engage in any combination or conspiracy hereby declared to be illegal shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$100,000,000 . . .”).

¹⁸ *See* Mutchnik et al., *supra* note 7, at 1.

¹⁹ 18 U.S.C. § 3571(d); *see also* Mutchnik et al., *supra* note 7, at 1 (quoting 18 U.S.C. § 3571(d)).

²⁰ U.S. SENTENCING GUIDELINES MANUAL §§ 8C2.3-2.9.

²¹ *Id.* at § 2R1.1(d)(1) (“In lieu of the pecuniary loss under subsection (a)(3) of § 8C2.4 (Base Fine), use 20 percent of the volume of affected commerce.”).

²² *See* Mutchnik et al., *supra* note 7, at 2 (quoting U.S. SENTENCING GUIDELINES MANUAL § 8C2.6 (2004)).

²³ *See id.* at 2 n.6.

²⁴ U.S. SENTENCING GUIDELINES MANUAL § 8C2.5(g)(2).

²⁵ *See id.* § 8C2.5(c).

As an example, assume the VOC is \$10 million per month over a two-year conspiracy, and the culpability score is two.²⁶ In this case, the base fine level under the USSG would be \$48 million (20 percent of \$240 million), and the adjusted fine is \$96 million (\$48 million, multiplied by the culpability score, two). The fine calculation is simple once a VOC and the culpability level have been determined. Calculating VOC, however, is not always straightforward.²⁷

A. *Rationale for the USSG Approach*

The relatively simple methodology used to calculate fines under the USSG²⁸ was designed to achieve several objectives. One goal was to deter future criminal cartel behavior.²⁹ Indeed, there is some evidence that the USSG may have been designed to achieve an appropriate level of deterrence based on the presumption that “the average gain from price-fixing is 10 percent of the selling price.”³⁰ The U.S. Sentencing Commission used 20 percent (double the presumed average 10 percent gain) to account for additional potential harms to consumer welfare (e.g., consumers declining to buy the product due to the higher prices) that exceed the average overcharge.³¹ The multiplier, which ranges between 0.75 and four, can potentially add to the overall penalty and deter future anticompetitive behavior.³²

The relative simplicity of the USSG also reduces the administrative burden of calculating fines. The U.S. Sentencing Commission stated that “[t]he purpose for specifying a percent of the VOC is to avoid the time and expense that would be required for the court to determine the actual gain or

²⁶ Under the USSG, the baseline culpability score is five. *Id.* § 8C2.5(a). A corporation might attain a culpability score of two if the antitrust violation occurred despite the presence of “an effective compliance and ethics program,” which subtracts three from the base culpability score. *Id.* § 8C2.5(f)(1).

²⁷ See *infra* notes 46-69.

²⁸ See, e.g., U.S. SENTENCING GUIDELINES MANUAL § 1B1.1 (setting forth step-by-step instructions for calculating sentences); *id.* § 2R1.1 (establishing a “base offense level” and adjusting for particular volumes of affected commerce); *id.* § 5E1.2 (setting forth a rigid structure for fines based on the calculated “offense level”).

²⁹ Anne Marie Herron, Comment, *The Antitrust Sentencing Guideline: Detering Crime by Clarifying the Volume of Commerce Muddle*, 51 EMORY L.J. 929, 941 (2002).

³⁰ John M. Connor & Robert H. Lande, *How High Do Cartels Raise Prices? Implications for Optimal Cartel Fines*, 80 TUL. L. REV. 513, 523 (2005) (quoting U.S. SENTENCING GUIDELINES MANUAL § 2R1.1 cmt. n.3 (2004)) (internal quotation marks omitted). We discuss the notion of optimal deterrence in more detail later in this Article. See *infra* Part III.A.

³¹ See Connor & Lande, *supra* note 30, at 524.

³² *Id.*

loss.”³³ The U.S. Sentencing Commission seems to have preferred “greater administrative convenience” to an inquiry into the real loss in each case.³⁴

B. Courts’ Interpretations of “Affected Commerce”

The Supreme Court upheld jury awards of damages in three early anti-trust cases that provide the standard for evidence in antitrust damage analyses. In *Eastman Kodak Co. v. Southern Photo Materials Co.*,³⁵ the Court rejected the accused conspirator’s argument that damages must be calculated precisely from facts and hard data, holding instead that approximations would suffice.³⁶ The *Eastman Kodak* Court was critical of the conspirator’s proposed standard of review, pointing out that the conspirator’s own actions directly caused the plaintiff’s lack of detailed market information.³⁷

The Court revisited the issue a few years later in *Story Parchment Co. v. Paterson Parchment Paper Co.*,³⁸ adopting a reasonableness standard in evaluating the “natural and probable effect” of price fixing.³⁹ The Court echoed the policy concerns it voiced in *Eastman Kodak*, pointing out that the wrongdoer should bear the consequences of uncertainty.⁴⁰ The Court reiterated in *Bigelow v. RKO Radio Pictures, Inc.*⁴¹ that a heightened evidentiary standard would reward conspiring parties for concealing the very pricing information plaintiffs would require to meet that standard.⁴²

The evidentiary requirement under *Eastman Kodak*, *Story Parchment*, and *Bigelow* does not allow a factfinder to engage in “speculation or guess[work],” but does allow it to make a reasonable estimate of the “probable” amount.⁴³ Under these cases, an “approximate” calculation suffices.⁴⁴

³³ *Id.* at 523 (quoting U.S. SENTENCING GUIDELINES MANUAL § 2R1.1 cmt. n.3 (2010)) (internal quotation marks omitted).

³⁴ Connor & Lande, *supra* note 30, at 524 (quoting *United States v. Hayter Oil Co.*, 51 F.3d 1265, 1276 (6th Cir. 1995)) (internal quotation marks omitted). The Sixth Circuit explicitly noted this incentive. *Hayter Oil*, 51 F.3d at 1267.

³⁵ 273 U.S. 359 (1927).

³⁶ *Id.* at 378-79 (quoting *Eastman Kodak Co. v. S. Photo Material Co.*, 295 F. 98, 102 (5th Cir. 1923)).

³⁷ *Id.* at 379 (“[A] defendant whose wrongful conduct has rendered difficult the ascertainment of the precise damages suffered by the plaintiff, is not entitled to complain that they cannot be measured with the same exactness and precision as would otherwise be possible.”).

³⁸ 282 U.S. 555 (1931).

³⁹ *See id.* at 561-62.

⁴⁰ *Id.* at 563.

⁴¹ 327 U.S. 251 (1946).

⁴² *Id.* at 264-65.

⁴³ *Id.* at 264; *Story Parchment*, 282 U.S. at 563; *Eastman Kodak*, 273 U.S. at 378-79.

⁴⁴ *Story Parchment*, 282 U.S. at 563; *see also Bigelow*, 327 U.S. at 264; *Eastman Kodak*, 273 U.S. at 378-79.

As antitrust damage jurisprudence has evolved, the VOC has become the relevant calculation in criminal antitrust cases.⁴⁵

The VOC has been the subject of several recent decisions, with four Courts of Appeals considering the proper manner of calculating VOC, but failing to reach consensus.⁴⁶ Commentators have noted courts' disagreement about whether "affected commerce"⁴⁷ should include only those sales for which the cartel successfully raised prices or all sales during the period of interest.⁴⁸

In *United States v. Hayter Oil Co.*,⁴⁹ the Sixth Circuit took a broad view in defining the time period affected by collusive activity.⁵⁰ The *Hayter Oil* defendants engaged in a price-fixing conspiracy for forty weeks between 1984 and 1988;⁵¹ the court rejected the defendants' argument that they should only be held criminally liable for the forty-week period during which their cartel was successful.⁵² The court reasoned that limiting criminal liability to only those instances in which price fixing was successful would not serve as a sufficient deterrent.⁵³

In *United States v. SKW Metals & Alloys, Inc.*,⁵⁴ the Second Circuit proposed a slightly more forgiving rule.⁵⁵ While agreeing with the *Hayter Oil* court that fines must be adequate to serve as a deterrent to would-be cartel makers,⁵⁶ the *SKW Metals* court was unwilling to conclude without basis that the minimum fines set forth in the USSG would not serve that

⁴⁵ See Herron, *supra* note 29, at 930-31 (noting that a uniform VOC standard would aid in administration of the USSG). *But see* Mutchnik et al., *supra* note 7, at 2 (noting that VOC is a relatively infrequently litigated issue).

⁴⁶ See Herron, *supra* note 29, at 930-31 & n.12 (citing *United States v. Giordano*, 261 F.3d 1134 (11th Cir. 2001), *United States v. Andreas*, 216 F.3d 645 (7th Cir. 2000), *United States v. SKW Metals & Alloys, Inc.*, 195 F.3d 83 (2d Cir. 1999), and *United States v. Hayter Oil Co.*, 51 F.3d 1265 (6th Cir. 1995)).

⁴⁷ U.S. SENTENCING GUIDELINES MANUAL §§ 2R1.1(b)(2), 2R1.1(d)(1) (2010) ("[T]he volume of commerce attributable to an individual participant in a conspiracy is the volume of commerce done by him or his principal in goods or services that were *affected by* the violation." (emphasis added)).

⁴⁸ Herron, *supra* note 29, at 945 (describing the "two central opposing interpretations" of the phrase "volume of commerce" as meaning either "(1) all sales made by the defendant within the scope of a conspiracy, or (2) only those sales that were *actually* influence by the conspiracy. Depending on which interpretation is employed, sentences are subject to great variability, causing inconsistencies across jurisdictions").

⁴⁹ 51 F.3d 1265 (6th Cir. 1995).

⁵⁰ *Id.* at 1274.

⁵¹ *Id.* at 1268.

⁵² *Id.* at 1274.

⁵³ *Id.* at 1273-74.

⁵⁴ 195 F.3d 83 (2d Cir. 1999).

⁵⁵ *Id.* at 91-92.

⁵⁶ *Id.* at 92.

purpose.⁵⁷ Although it was concerned with deterrence, the court was reluctant to simply discard the USSG's statutory minimums as effective, calling instead for more than just a "tenuous presumption" that the minimums would not suffice.⁵⁸

A year after *SKW Metals*, in *United States v. Andreas*,⁵⁹ the Seventh Circuit agreed with the *Hayter Oil* court that the term "affected commerce" should be construed broadly,⁶⁰ but it also agreed with the *SKW Metals* court that a per se rule defining all sales during the conspiracy period as "affected sales" was too harsh.⁶¹ The *Andreas* court recognized that not all sales during the period under examination would necessarily be affected by a cartel.⁶² The *Andreas* court held that the burden of identifying sales to be excluded from the VOC should fall on the defendant, who presumably has an information advantage on that subject.⁶³

In the 2001 case *United States v. Giordano*,⁶⁴ the Eleventh Circuit largely agreed with the *Andreas* and *SKW Metals* courts, accepting a broad interpretation of "volume of commerce" and rejecting *Hayter Oil*'s per se rule.⁶⁵ The *Giordano* court urged that VOC analysis need not be a "sale-by-sale accounting,"⁶⁶ but it interpreted *Andreas* and *SKW Metals* as excluding from the VOC those sales made when the cartel was ineffectual.⁶⁷

The Courts of Appeals disagree as to which commerce is "affected" for purposes of the VOC.⁶⁸ However, all of the Courts of Appeals that recently considered the VOC discussed sales data during the cartel period in

⁵⁷ *Id.* ("Presumably, 'general deterrence' can be adequately served without sentencing on the basis of a tenuous presumption that commerce is affected by all sales within the period set forth in the indictment regardless of what effects, if any, the conspiracy may have had.").

⁵⁸ *Id.*

⁵⁹ 216 F.3d 645 (7th Cir. 2000).

⁶⁰ *Id.* at 676-77 (pointing out that counting as "affected" only those sales that occurred exactly at the cartel's target price would be a "ridiculous" interpretation of the USSG).

⁶¹ *Id.* at 677-78.

⁶² *Id.* at 678 ("[I]t is conceivable that under a price agreement, sales made before new price schedules are issued or new quotes given to potential customers may be wholly unaffected, or that some subsequent sales might be sold at the actual market price." (citing *SKW Metals*, 195 F.3d at 93 (Newman, J., concurring) ("[A] defendant's brother-in-law might call one day and ask for a product at a bargain price . . . and the seller agrees to the bargain price motivated solely by concern to help his relative, with no thought whatever about the fixed price [that he charges] other customers."))).

⁶³ *Id.* at 678-79.

⁶⁴ 261 F.3d 1134 (11th Cir. 2001).

⁶⁵ *Id.* at 1145-47.

⁶⁶ *Id.* at 1146 (internal quotation marks omitted).

⁶⁷ *Id.* at 1146-47 ("When a conspiracy is a non-starter, however, or when the illegal agreement is ineffectual during a certain time period, those sales should not be included in the volume of commerce, because they were not 'affected by' the illegal agreement.").

⁶⁸ Herron, *supra* note 29, at 945-54 (summarizing the decisions in *Hayter Oil*, *SKW Metals*, *Andreas*, and *Giordano*).

some detail.⁶⁹ Their willingness to do so may indicate their interest in basing damage awards on accurate, reliable data.

C. *Reconsidering the Precise Calculation of Antitrust Damages*

Recent events have opened the door for greater judicial discretion in determining criminal fines in conspiracy cases. Most notably, the Supreme Court has held that the USSG are not mandatory, only advisory.⁷⁰ In addition, the use of economic damage analyses in criminal antitrust cases is becoming increasingly sensible due to the substantial increase in the VOC and fines that the U.S. Sentencing Commission may have not fully anticipated.

1. The End of Mandatory USSG

In *United States v. Booker*, the Supreme Court issued a two-part opinion first addressing the Sixth Amendment implications of judicial fact-finding in criminal sentencing, then examining the compulsory nature of the USSG.⁷¹ After a five-Justice majority led by Justice Stevens held that judges could not rely on their own post-verdict fact-finding to increase a convicted defendant's sentence beyond the USSG's maximum,⁷² a separate majority led by Justice Breyer excised two provisions that made the USSG mandatory authority for judges.⁷³

After conducting an analysis of Congress's intent in enacting the USSG,⁷⁴ Justice Breyer's majority concluded that merely imposing a requirement that a jury be the one to consider all evidence relevant to sentencing would be inadequate.⁷⁵ Reinforcing Congress's purpose in enacting

⁶⁹ See *Giordano*, 261 F.3d at 1144, 1147; *United States v. Andreas*, 216 F.3d 645, 651-53 (7th Cir. 2000); *United States v. SKW Metals & Alloys, Inc.*, 195 F.3d 83, 87 (2d Cir. 1999); *United States v. Hayter Oil Co.*, 51 F.3d 1265, 1269, 1272 (6th Cir. 1995).

⁷⁰ See *United States v. Booker*, 543 U.S. 220, 245-46 (2005) (5-4 decision).

⁷¹ *Id.* at 229.

⁷² *Id.* at 232. In *Booker*, the jury found the defendant guilty of possessing 92.5 grams of crack cocaine, an offense which the USSG required was punishable by 210 to 262 months. *Id.* at 235. After the jury's verdict, however, the judge held a post-trial sentencing proceeding, where it was revealed that the defendant possessed far more crack cocaine—566 grams more—than the jury found. *Id.* at 227. Based on the larger amount, the judge added nearly ten years to the defendant's sentence. *Id.* at 235. The Court held that a jury, not a judge, must be the finder of fact to support an enhancement of sentence beyond the USSG's maximum. *Booker*, 543 U.S. at 244 (citing *Blakely v. Washington*, 542 U.S. 296, 313 (2004)).

⁷³ *Id.* at 245.

⁷⁴ *Id.* at 246-49, 265 (referring to "the judge-based sentencing system that Congress enacted into law").

⁷⁵ *Id.* at 249-58.

the USSG—uniform sentencing for crimes of a similar nature⁷⁶—Justice Breyer pointed out that if a jury trial component were simply grafted onto the USSG, prosecutors would be permitted to control sentencing by merely deciding which charges to bring.⁷⁷ Justice Breyer’s majority was also concerned that such a statute would prevent judges from using their expertise to ensure that defendants, who commit the same illegal acts but are charged with different crimes, are not given grossly disparate sentences.⁷⁸

Justice Breyer’s *Booker* majority severed only two provisions from the Sentencing Reform Act of 1984, leaving the rest of the statute intact.⁷⁹ By removing the requirement that district courts rigidly follow the USSG, the majority’s holding increased the discretion available to judges in devising sentences.⁸⁰ While sentencing judges are still bound to consider the USSG,⁸¹ they are free to exercise policy decisions in determining a sentence.⁸² Justice Breyer’s majority held that judges should apply a “reasonableness” standard when sentencing defendants.⁸³

As discussed above, the USSG sets forth rigid calculations to arrive at a particular penalty for a given volume of affected commerce⁸⁴ while accounting for a defendant’s role and conduct.⁸⁵ In making the USSG “effectively advisory,”⁸⁶ however, the *Booker* Court authorized greater judicial discretion in determining financial penalties. This increased discretion includes the potential use of the types of damage analyses courts already rely on in civil antitrust actions.⁸⁷

⁷⁶ *Id.* at 255.

⁷⁷ *Id.* at 256-57. *But see* Michael A. Simons, *Prosecutors as Punishment Theorists: Seeking Sentencing Justice*, 16 *GEO. MASON L. REV.* 303, 350-51 (2009) (predicting that post-*Booker*, prosecutors will feel a sense of responsibility to issue the theoretically correct punishment and file charges—or not—accordingly).

⁷⁸ *Booker*, 543 U.S. at 250-54 (explaining and providing hypothetical situations, which illustrate that certain crimes, such as obstructing, delaying, or affecting commerce, mail fraud, or robbery, can result from vastly different underlying conduct and, thus, judges typically look to accounts of real conduct for guidance).

⁷⁹ *Id.* at 258-59 (excising 18 U.S.C. § 3553(b)(1) (2000), which described the mandatory nature of USSG for sentencing courts, and 18 U.S.C. § 3742(e), which established de novo review of sentencing decisions).

⁸⁰ *Id.* at 259 (noting that with the excision of 18 U.S.C. §3553(b)(1), judges must “take account of the Guidelines together with other sentencing goals” set forth in Section 3553(a)).

⁸¹ 18 U.S.C. § 3553(a)(2) (2006) (“The court, in determining the particular sentence to be imposed, shall consider [seven policy-based factors].” (emphasis added)); *see also Booker*, 543 U.S. at 264.

⁸² *Booker*, 543 U.S. at 259-60.

⁸³ *Id.* at 262 (internal quotation marks omitted).

⁸⁴ U.S. SENTENCING GUIDELINES MANUAL § 2R1.1 (2010).

⁸⁵ *E.g.*, U.S. SENTENCING GUIDELINES MANUAL §§ 3B1-C1, 5K1, 8C2.2, 8C4.

⁸⁶ *Booker*, 543 U.S. at 245.

⁸⁷ *See* Pierre Cremieux et al., *Proof of Common Impact in Antitrust Litigation: The Value of Regression Analysis*, 17 *GEO. MASON L. REV.* 939, 943 (2009) (noting the trend of federal courts to

2. Higher Stakes and Increased Complexity in Damage Calculations

It is doubtful that the U.S. Sentencing Commission, which authored the USSG in 1984,⁸⁸ could have foreseen several recent developments in criminal antitrust jurisprudence.⁸⁹ First, fines imposed in criminal antitrust cases have dramatically increased over the last decade. The record fine for a single Sherman Act count stood at \$6 million in 1994, but there have been eleven cases since then with fines of \$100 million or more.⁹⁰ The U.S. Antitrust Division at the Department of Justice collected \$188 million in criminal corporate fines during the 1980s, a figure that increased almost 10 fold to \$1.6 billion during the 1990s and increased still further to \$4.2 billion between 2000 and 2009.⁹¹

As fine levels increase, they may eclipse the cost of more precisely estimating damages. From an economic perspective, the administrative costs of more rigorous calculations are increasingly justifiable as the potential fine value rises, because these calculations can prevent costly errors when fines are underestimated or overestimated.⁹²

Recent decisions have attempted to calculate the appropriate VOC, and some of the decisions imply that courts may welcome economic damage analyses in criminal antitrust sentencing.⁹³ The *Hayter Oil*, *SKW Metals*, *Andreas*, and *Giordano* courts all made clear that VOC should not be interpreted narrowly, and they agreed that the “affected commerce” may at least include sales not made at the cartel’s target price.⁹⁴ The Sixth Circuit in *Hayter Oil* relied on commentary to the USSG that characterized damages as “difficult and time consuming to establish.”⁹⁵ All of these decisions expressed concern about the burden of the detailed analysis necessary to identify the precise damages from the conspiracy.⁹⁶ However, *Hayter Oil*,

consider evidence in more detail and to be skeptical of expert witnesses who do not provide models demonstrating the method in which they calculated damages).

⁸⁸ Sentencing Reform Act of 1984, Pub. L. No. 98-473, § 211, 98 Stat. 1837, 2017-18 (1984).

⁸⁹ See Tara L. Reinhart et al., *The Business of Sentencing: Facing the Facts after Blakely, Booker, and Fanfan*, THE ANTITRUST SOURCE, Jan. 2005, at 1, 1-2 (explaining that the Supreme Court drastically changed federal sentencing and diluted the impact of the USSG through the cases of *Blakely*, *Booker*, and *Fanfan*).

⁹⁰ Mutchnik et al., *supra* note 7, at 1.

⁹¹ Scott D. Hammond, Deputy Assistant Att’y Gen. for Criminal Enforcement, U.S. Dep’t of Justice, Antitrust Div., *The Evolution of Criminal Antitrust Enforcement Over the Last Two Decades*, Address at the National Institute on White Collar Crime 5 fig. (Feb. 25, 2010), available at <http://www.justice.gov/atr/public/speeches/255515.pdf>.

⁹² See Herron, *supra* note 29, at 959-60.

⁹³ See *supra* Parts I.B., I.C.1.

⁹⁴ See *supra* Part I.B.

⁹⁵ *United States v. Hayter Oil Co.*, 51 F.3d 1265, 1274 (6th Cir. 1995) (quoting U.S. SENTENCING GUIDELINES MANUAL § 2R1.1 cmt. background (1995)) (internal quotation marks omitted).

⁹⁶ See *supra* Part I.B.

SKW Metals, *Andreas*, and *Giordano* were all decided ten years before *Booker* made the USSG non-mandatory, so the courts may understandably have been reluctant to discard the guidance of any portion of the USSG.⁹⁷

The pre-*Booker* VOC decisions suggest that some evidence demonstrating the impact of a criminal conspiracy is necessary for determining the size and scope of the VOC. For example, in *SKW Metals*, the Second Circuit stated:

If the conspiracy was a non-starter, or if during the course of the conspiracy there were intervals when the illegal agreement was ineffectual and had no effect or influence on prices, then sales in those intervals are not ‘affected by’ the illegal agreement, and should be excluded from the volume of commerce calculation.⁹⁸

The *SKW Metals* holding suggests that the court would have welcomed an in-depth analysis of overcharge due to the alleged conspiracy to determine the size of the VOC.⁹⁹ As explained below, economists already frequently employ this sort of analysis when they estimate antitrust damages in civil price-fixing cases.¹⁰⁰

C. Summary

While the USSG’s fine-estimation framework was designed to reduce the administrative burden in calculating appropriate financial penalties in criminal antitrust cases,¹⁰¹ recent events indicate that courts may be willing to engage in more sophisticated damage analyses in some cases.¹⁰² The Supreme Court’s *Booker* decision allows greater judicial discretion in sentencing for criminal antitrust violations because it limits the USSG to advising sentencing decisions, but does not make the USSG rigid, mandatory rules.¹⁰³

The types of damage analyses economists have carried out in civil suits may be useful in more accurately estimating the appropriate VOC affected by a given criminal enterprise, and recent decisions imply that courts are amenable to allowing damage analyses to play this important role.¹⁰⁴ Such analyses of antitrust damages will usually be more costly than

⁹⁷ See *Hayter Oil*, 51 F.3d at 1274 (“[T]he Sentencing Commission intended that the government have the benefit of a per se rule both at trial and at sentencing to avoid the protracted inquiry into the day-to-day success of the conspiracy.”).

⁹⁸ *United States v. SKW Metals & Alloys, Inc.*, 195 F.3d 83, 91 (2d Cir. 1999).

⁹⁹ See *id.*

¹⁰⁰ See *infra* Part II.A.

¹⁰¹ See *supra* Part I.A.

¹⁰² See *supra* Part I.C.2.

¹⁰³ *United States v. Booker*, 543 U.S. 220, 245-46 (2005) (5-4 decision); see also *supra* Part I.C.1.

¹⁰⁴ See *supra* Part I.A-B.

the USSG formula, and courts and enforcers should account for such costs in evaluating whether to apply damage analysis techniques in a particular case.¹⁰⁵ The substantial increase in the level of criminal fines in antitrust cases makes it increasingly sensible to incur the administrative expense of precise damage calculations, since such analyses can avoid errors in estimating appropriate criminal penalties.¹⁰⁶

II. POTENTIAL APPLICATION OF ANTITRUST CIVIL DAMAGE ANALYSES TO CRIMINAL ANTITRUST CASES

Parties frequently call on economists and financial analysts to estimate harm to customers in civil antitrust cases.¹⁰⁷ While the techniques used to estimate damages vary¹⁰⁸ and the data is often imperfect,¹⁰⁹ federal courts have nevertheless found such damage estimates to be sufficiently reliable.¹¹⁰ This section summarizes techniques and data economists use to estimate damages in civil antitrust cases. These same types of analyses could also be used to estimate VOC in criminal conspiracy cases.

A. *Liability, Causation, and Damage Analysis*

In analyzing damages for a civil case, an economist begins by clearly identifying the allegedly improper acts (e.g., a conspiracy to raise prices).¹¹¹ He then assesses the injury-in-fact or “impact” of the alleged acts on the plaintiffs, and quantifies damages based on the impact.¹¹² Typically, an ex-

¹⁰⁵ See *infra* Part III.B.

¹⁰⁶ See *infra* Part III.

¹⁰⁷ See Maarten Pieter Schinkel, *Forensic Economics in Competition Law Enforcement*, 4 J. COMPETITION L. & ECON. 1, 24 (2008).

¹⁰⁸ See Theon van Dijk & Frank Verboven, *Quantification of Damages*, in 3 ISSUES IN COMPETITION LAW AND POLICY 2331, 2331-48 (ABA Section of Antitrust Law 2008); see also *infra* Part II.B.3.

¹⁰⁹ The defendant’s acts may contribute to the plaintiff’s inability to provide precisely accurate estimates of market prices in the absence of the conspiracy. *Bigelow v. RKO Radio Pictures, Inc.*, 327 U.S. 251, 265 (1946) (“[T]he wrongdoer may not object to the plaintiff’s reasonable estimate of the cause of injury and of its amount, supported by the evidence, because not based on more accurate data which the wrongdoer’s misconduct has rendered unavailable.”).

¹¹⁰ *Eastman Kodak Co. v. S. Photo Materials Co.*, 273 U.S. 359, 379 (1927) (“Damages are not rendered uncertain because they cannot be calculated with absolute exactness. It is sufficient if a reasonable basis of computation is afforded, although the result be only approximate.”).

¹¹¹ See Hays Gorey, Jr. & Henry A. Einhorn, *The Use and Misuse of Economic Evidence in Horizontal Price-Fixing Cases*, 12 J. CONTEMP. L. 1, 19-21 (1986) (explaining that economists may testify to assist the judge or jury in determining whether coordinated economic behavior has or has not occurred).

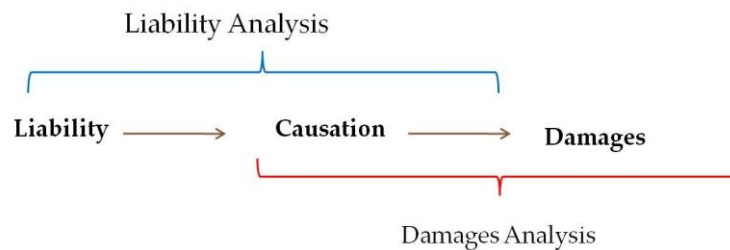
¹¹² See Cremieux et al., *supra* note 87, at 945.

pert assesses the likely effects of a defendant's allegedly improper acts by reconstructing what would likely have happened but-for the bad acts.¹¹³

It is generally recognized that in demonstrating injury in fact, the plaintiff bears the burden of demonstrating that the defendant's allegedly anticompetitive acts in fact caused the plaintiff harm.¹¹⁴ A proper damage analysis, therefore, presents and substantiates a theory of causation that explains how the alleged acts affected the plaintiffs.¹¹⁵ For example, if parties are accused of allocating customers, an expert would seek data that is consistent with customers purchasing only from the conspirator to whom they were assigned.¹¹⁶ The expert may also look for evidence that the customers affected by the agreement actually paid higher prices than they would have in the absence of a conspiracy.¹¹⁷ Establishing causation is an essential step in identifying the impact of the alleged acts.¹¹⁸

Figure 1 provides a simple illustration of the relationship between liability, causation, and damages. As shown in the Figure, causation bears on both liability and damages.

Figure 1: The Relationship Between Liability and Damage Analysis



- Causation bears on both liability *and* damages
- must be clearly defined

¹¹³ See Stephen H. Kalos, *Antitrust*, in LITIGATION SERVICES HANDBOOK: THE ROLE OF THE FINANCIAL EXPERT § 24, § 24.5, at 11-13 (Roman L. Weil et al. eds., 4th ed. 2007) (“The courts use a but-for standard to calculate both overcharge and lost profits damages; this standard compares actual prices or profits and the prices or profits that would have occurred but for the anticompetitive acts.”); see also PROVING ANTITRUST DAMAGES, *supra* note 1, at 53.

¹¹⁴ Cremieux et al., *supra* note 87, at 941.

¹¹⁵ See PROVING ANTITRUST DAMAGES, *supra* note 1, at 53.

¹¹⁶ See *Petruzzi’s IGA Supermarkets, Inc. v. Darling-Del. Co.*, 998 F.2d 1224, 1236-37 (3d Cir. 1993) (noting that expert economic testimony was proffered by the plaintiffs to try to show that the defendants were allocating customers).

¹¹⁷ See PROVING ANTITRUST DAMAGES, *supra* note 1, at 130.

¹¹⁸ See *id.* at 53 (“The essential starting point for any damages quantification is the but-for premise that the defendant’s violation did not occur.”).

The nature and extent of causation depends on the type of conspiracy that is alleged. An agreement to restrict output might increase prices paid by all customers, but the customers might each feel the impact to varying degrees.¹¹⁹ An agreement to allocate customers or geographic areas could have a similarly broad impact.¹²⁰ However, some price-fixing conspiracies might, by their very nature, only affect selected customers or certain geographic areas (e.g., a scheme to fix gasoline prices at a few service stations in a small town).¹²¹ In such cases, the economic analysis can potentially be limited to those customers or areas.

B. *The But-For Pricing Methodology*

Determining the relevant market characteristics in the actual and but-for worlds is important to damage analysis, because the plaintiff's injury is the difference between the actual outcome and that which would have likely occurred but for the conspiracy.¹²² In a price-fixing case, for example, damage analysis typically compares the actual prices customers paid during the conspiracy with estimates of the prices that they would have paid during that same period had the price-fixing conspiracy not been in place.¹²³ That is, damages in civil conspiracy cases are typically estimated based on the affected quantity of sales during the conspiracy period multiplied by the difference between price customers paid and the prices that they would likely have paid absent the conspiracy. The equation below shows how damages are estimated using this but-for methodology:

$$D = (P_{actual} - P_{but-for})Q_{actual},$$

where

D is the estimated damages;

P_{actual} is the actual price customers paid for the good or service;

$P_{but-for}$ is the estimated price that would have been paid but for the alleged bad acts; and

Q_{actual} is the actual quantity of the good or service purchased.¹²⁴

¹¹⁹ See *id.* at 218 (indicating that collusion, which restricts output, may result in higher prices).

¹²⁰ See *Petruzzi's*, 998 F.2d at 1228 (indicating that the plaintiff alleged that the defendants conspired to allocate customer accounts across Pennsylvania, New Jersey, and Connecticut).

¹²¹ *United States v. Hayter Oil Co.*, 51 F.3d 1265, 1266-67 (6th Cir. 1995).

¹²² PROVING ANTITRUST DAMAGES, *supra* note 1, at 53 ("A quantification of the difference between the plaintiff's experience in the but-for and actual worlds determines the amount of damages.")

¹²³ See *New York v. Julius Nasso Concrete Corp.*, 202 F.3d 82, 88 (2d Cir. 2000); see also PROVING ANTITRUST DAMAGES, *supra* note 1, at 53 n.2.

¹²⁴ Joseph E. Harrington, Jr., *Post-Cartel Pricing During Litigation*, 52 J. INDUS. ECON. 517, 517 (2004) (citing the same formula and describing it as the standard method in the United States for determining damages for firms found guilty of collusion).

For example, if the actual price for a product was \$270 and customers would likely have paid \$250 in the absence of the alleged conspiracy, then the overcharge per unit is \$20. Furthermore, if consumers purchased one million units and the estimated overcharge for each unit was \$20, then the conspiracy caused \$20 million of damage.

Economists can apply the but-for pricing methodology on a market-wide basis, across a group of products or customers, or on an individual customer basis.¹²⁵ In some cases, an expert might estimate damages based on aggregated sales or profit data for the entire group of customers allegedly impacted by a conspiracy. For example, in cases where there is available data for the entire group of customers impacted by the alleged conspiracy and where an average but-for price can be appropriately estimated for the group, then an economist may simply rely on these aggregated data to estimate damages.

In other cases, an economist may estimate damages using separate actual and but-for prices for groups of customers or even for individual customers.¹²⁶ This can be a superior approach where reliable price or profit data is available at a more micro level and where it is important to estimate differential impact across customers. In these situations, the expert bases total damages on the sum of the damages estimated for the individual customers or customer groups.¹²⁷

Estimating but-for prices in damage calculations typically combines economic reasoning and available financial data to generate a reasonable estimate of the market prices but-for the conspiracy.¹²⁸ There are a number of key questions an economist must answer in conducting analyses of but-for prices, such as:

- * Can the actual data on price and quantity be accurately measured?
- * What are the relevant products and sales affected by the cartel?
- * How can prices but-for the alleged anticompetitive acts be reliably estimated?

Economic analyses that address these issues, by making use of appropriate economic methods and are based on reliable information, result in

¹²⁵ See PROVING ANTITRUST DAMAGES, *supra* note 1, at 125.

¹²⁶ *Id.* at 53.

¹²⁷ See *id.*; see also Hans W. Friederszick & Lars-Hendrick Röller, *Quantification of Harm in Damages Actions for Antitrust Infringements: Insights from German Cartel Cases*, 6 J. COMPETITION L. & ECON. 595, 601 & n.16 (2010) (discussing the need for correct market definition and other forces at issue in those markets prior to determining damages).

¹²⁸ See PROVING ANTITRUST DAMAGES, *supra* note 1, at 125-26.

reasonably accurate estimates,¹²⁹ and courts are reluctant to discard such analyses.¹³⁰

1. Complications in Measuring Actual Prices and Quantities Sold

Economists analyze various types of sales data to measure actual prices and quantities paid for a good or service.¹³¹ As mentioned previously, aggregated sales data may be adequate in cases where the price impact can be reliably measured across groups of customers.¹³² The necessary aggregate sales and quantity information may be found in the companies' own business-planning or financial documents or from other potentially reliable industry sources (e.g., industry reports, public company filings, and government data).¹³³

Other cases may require analyses of customer transaction or invoice data.¹³⁴ This may be particularly true when impact varies across customers, and damage estimates can be improved by estimating differences in customer impact. Customer-level data is often available from electronic files maintained by the companies under investigation and can potentially provide relatively accurate measures of actual prices and quantities.¹³⁵ The information contained in such customer-transaction-level data typically identifies the customer and provides details about the date, terms, and location of each transaction.¹³⁶

Because customer transaction datasets for large companies can be immense, the process of analyzing the data and estimating prices and quantities can be expensive and time consuming. However, computer programs

¹²⁹ See *In re Linerboard Antitrust Litig.*, 497 F. Supp. 2d 666, 677 (E.D. Pa. 2007) (noting that the Third Circuit found that it was inappropriate to exclude an economic model even though it was not particularized and instead aggregated damages into one figure).

¹³⁰ See, e.g., *In re Polypropylene Carpet Antitrust Litig.*, 93 F. Supp. 2d 1348, 1365 (N.D. Ga. 2000) ("Merely pointing to economic conditions that may affect the dependant variable is not enough to call into question the reliability of an econometric model.").

¹³¹ See Kalos, *supra* note 113, § 24.5, at 11.

¹³² Cf. *Costco Wholesale Corp. v. Maleng*, 522 F.3d 874, 900 (9th Cir. 2008) (stating that the uniform pricing rule required distributors to sell their "beer and wine products to every retailer at the same price").

¹³³ See PROVING ANTITRUST DAMAGES, *supra* note 1, at 97 ("In many cases, the primary source of data for damage calculations will be the company's financial statements."); see also Kalos, *supra* note 113, § 24.5(e), at 13.

¹³⁴ Cf. *Polypropylene*, 93 F. Supp. 2d at 1368 (discussing the economic expert's use of firm specific and internal cost data).

¹³⁵ Cf. PROVING ANTITRUST DAMAGES, *supra* note 1, at 97 (indicating that accountants focus on different measures than economists, which "imperfectly reflect[s] economic realities").

¹³⁶ Cf. Cremieux et al., *supra* note 87, at 966 tbl.5 (providing an example of a generic transactional-data table).

can often readily calculate revenues, quantities, and prices from such data, particularly if the data is available in a user-friendly electronic format.

Whether one uses aggregated data or detailed customer data for individual transactions, there can be challenges in measuring actual prices and actual quantities sold. When the alleged conspiracy happened many years before a case is brought, sales or discount information may only be available in hardcopy form or on older computer systems. Some data may be available only in formats that limit its usefulness, such as data that is available only for large time intervals. Data aggregated from a long time period can make it difficult to perform regression analysis and other calculations because such calculations require a particular number of data points to be accurate, and the available data may be insufficient.¹³⁷ Some price and sales data is available only for product families (not for individual products) or wide geographic areas (not for individual cities or regions). These forms of incomplete data may not provide sufficient detail for an economist to make meaningful determinations about the effect of a conspiracy.¹³⁸ However, even when the data is imperfect, economists are often able to generate reasonably reliable measures of actual market prices and quantities in civil antitrust cases.¹³⁹

2. Potential Limits on the Impact of a Conspiracy

Another important issue to consider in analyzing pricing data is whether all sales in the market are equally affected by an alleged cartel.¹⁴⁰ Large corporate customers may feel fewer ill effects of a cartel than smaller customers will.¹⁴¹ It can be useful, therefore, to analyze price trends across different types of customer groups to fully identify the impact of a conspiracy. Similarly, the alleged conspiracy may only impact certain geographic areas and not other areas, so economists often analyze price trends across geographic areas to identify the affected region.¹⁴² If sales to a particular type of customer were the only ones affected by the cartel, or if the conspir-

¹³⁷ See PROVING ANTITRUST DAMAGES, *supra* note 1, at 126.

¹³⁸ See *id.* at 128; see also George A. Hay, *Oligopoly, Shared Monopoly, and Antitrust Law*, 67 CORNELL L. REV. 439, 475 n.135 (1982).

¹³⁹ See, e.g., *In re Linerboard Antitrust Litig.*, 497 F. Supp. 2d 666, 677 (E.D. Pa. 2007); *Polypropylene*, 93 F. Supp. 2d at 1355-58.

¹⁴⁰ See John M. Connor, *Forensic Economics: An Introduction with Special Emphasis on Price Fixing*, 4 J. COMPETITION L. & ECON. 31, 44-45 (2008).

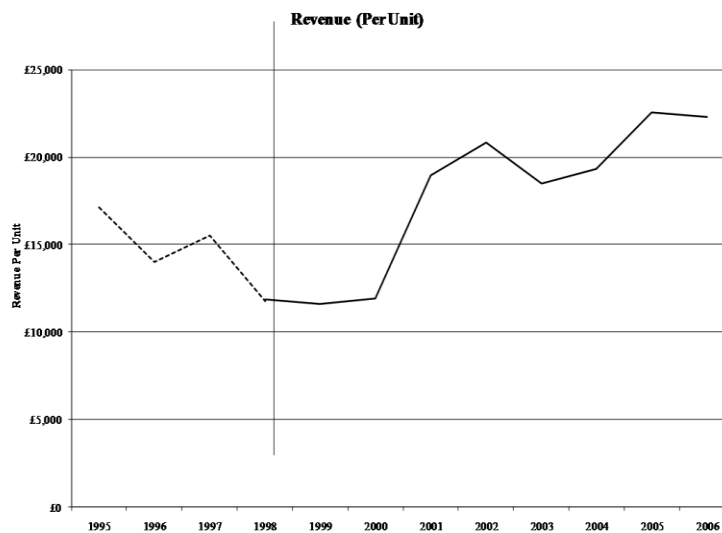
¹⁴¹ See Robert H. Lande & Howard P. Marvel, *The Three Types of Collusion: Fixing Prices, Rivals, and Rules*, 2000 WIS. L. REV. 941, 981 (2000) (stating that cartels will exploit differences in market demand elasticity among classes of customers).

¹⁴² See Cremieux et al., *supra* note 87, at 952-53 (describing how some calculations of damages must take into consideration market forces in particular cities).

acy only impacted sales in a limited area, the VOC calculation presumably should be limited to those sales.

In addition to geographic and demographic limitations, an analyst should consider the temporal scope of the alleged conspiracy.¹⁴³ As was the case in *Hayter Oil*, a cartel may break down for a short time, only to restart its illegal activity at a later date.¹⁴⁴ Indeed, economic theory predicts that cartels will often alternate between periods of cheating (characterized by price wars) and periods of strong consensus.¹⁴⁵ For example, Figure 2 shows prices over time in a hypothetical industry alleged to have conspired. During the period between 1998 and 2000, the conspiracy appears to have collapsed and resulted in a price war, as evidenced by the relatively low revenue per unit during that time. Accordingly, an analyst should exclude sales from this period from the VOC, even if the conspiracy existed before and after that period. Analysis of pricing over time, controlling for factors such as costs, is critical to producing a reliable damage estimate.

Figure 2: Revenue Per Unit



¹⁴³ See *id.* at 953 (demonstrating a situation where VOC calculations should be limited to one particular geographic area or city).

¹⁴⁴ *United States v. Hayter Oil Co.*, 51 F.3d 1265, 1267-68 (6th Cir. 1995).

¹⁴⁵ For a discussion of cartels and price wars, see DENNIS W. CARLTON & JEFFREY W. PERLOFF, *MODERN INDUSTRIAL ORGANIZATION* 144-49 (4th ed. 2005).

3. Techniques for Estimating But-For Prices

Economists have at their disposal numerous techniques for estimating but-for prices.¹⁴⁶ The “before-during” approach uses information on economic behavior before the allegedly improper acts to make inferences about what might have occurred during the cartel period in the absence of the improper acts.¹⁴⁷ For example, in an antitrust case involving an allegation of reduced competition and higher prices in a given market, the damage expert may use prices or price trends from that market recorded before the improper acts began as a benchmark to estimate prices but-for the allegedly anti-competitive actions.¹⁴⁸ In the related “during-after” approach, the antitrust expert relies on prices or price trends in the market of concern after the allegedly anticompetitive actions have ended, again controlling for any other influences on the market.¹⁴⁹

Figures 3 and 4 below compare actual and predicted prices using the “before-during” approach and the “during-after” approach in a hypothetical market.¹⁵⁰ Both of these Figures show noticeably higher prices during the period of the alleged conspiracy. In Figure 3, the conspiracy may have began around the thirteenth month, raising prices from around \$10 to around \$16, and the onset of cartel behavior may also have eliminated the variability of prices that existed prior to the alleged conspiracy. In Figure 4, the conspiracy appears to have ended at the thirteenth month of the data collection. At that time, the price dropped, because the market may have become competitive. This fall suggests a conspiracy before then may have led to higher prices. However, other factors might have caused the higher prices, such as higher production costs during the earlier period.¹⁵¹

¹⁴⁶ For a more thorough discussion of economic techniques used to estimate but-for prices, see PROVING ANTITRUST DAMAGES, *supra* note 1, at 56-62, 167-75, 202-08. See also Molly L. Zohn, Comment, *How Antitrust Damages Measure Up with Respect to the Daubert Factors*, 13 GEO. MASON L. REV. 697, 700-06 (2005) (outlining economic techniques).

¹⁴⁷ See PROVING ANTITRUST DAMAGES, *supra* note 1, at 57, 126-27; see also Kalos, *supra* note 113, § 24.5, at 11-13 (referring to the approach as “the before and after method”).

¹⁴⁸ As discussed below, the expert will control for other market influences (e.g., changes in variable costs) as appropriate to improve the estimate’s accuracy, see *infra* Part II.B.3.b.4.

¹⁴⁹ PROVING ANTITRUST DAMAGES, *supra* note 1, at 126-27.

¹⁵⁰ Connor, *supra* note 140, 46-49.

¹⁵¹ See *infra* Part II.B.3.a.

Figure 3: Before-During Approach: Actual and Predicted Prices



Figure 4: During-After Approach: Actual and Predicted Prices



If sufficient data is available, an economist may combine these approaches in a “before-during-after” analysis, which requires considering both the time before and the time after the collusive behavior.¹⁵² In addition, the economist might compare prices during periods of presumptive price wars to prices during periods of potential consensus.¹⁵³ Damage analyses may also investigate what has happened to prices or price trends during and after key events, such as meetings between the alleged conspirators.¹⁵⁴

¹⁵² PROVING ANTITRUST DAMAGES, *supra* note 1, at 57.

¹⁵³ See CARLTON & PERLOFF, *supra* note 145, at 144-49 (giving a general discussion of price wars between cartels).

¹⁵⁴ See, e.g., *United States v. Hayter Oil Co.*, 51 F.3d 1265, 1274-75 (6th Cir. 1995) (holding that damages should be calculated for the entire time period of the conspiracy, not just when a certain price

In the “yardstick” approach, the damage expert uses comparable markets or industries in estimating but-for outcomes.¹⁵⁵ For example, in an anti-trust case alleging reduced competition and higher prices, the damage expert might use prices or price trends in comparable “competitive markets” to estimate prices but for the allegedly anticompetitive actions in the affected market—as long as the major difference between the benchmark market and the market in question is the existence of the cartel in the latter.¹⁵⁶

a. *Adjusting For Changes in Costs*

All of the price-estimation approaches (“before-during,” “during-after,” and “yardstick”) assess whether the market outcomes in the benchmark period or market are economically reasonable predictors of the likely outcomes in the but-for market at the time of the allegedly improper acts. These analyses all compare market conditions in the but-for market to the conditions in the market in which the allegedly improper acts occurred. In particular, damage analysis must reasonably account for factors that may be causing outcomes (e.g., relatively high prices) in the market of concern other than the allegedly improper acts.¹⁵⁷

In analyzing the potential causes of price increases, economists often focus on changes in costs.¹⁵⁸ A common technique compares total revenue per unit with the producer’s average variable cost per unit.¹⁵⁹ Variable cost increases in most instances are passed on, at least in part, as price increases—even without a conspiracy.¹⁶⁰ Economic theory predicts that variable-cost changes (for example, changes in costs for labor or a key input) are the most likely to impact prices in the short run.¹⁶¹

Figure 5 illustrates the same hypothetical alleged conspiracy presented in Figure 2, in which a “price war” appears to have occurred during 1998-

was reached, the implication being that prices around the times of key meetings between cartels will also be included in the damage calculation).

¹⁵⁵ Connor, *supra* note 140, at 49.

¹⁵⁶ See PROVING ANTITRUST DAMAGES, *supra* note 1, at 57-58, 127; see also Kalos, *supra* note 113, § 24.5(d), at 12-13.

¹⁵⁷ Roger D. Blair & William H. Page, “*Speculative*” Antitrust Damages, 70 WASH. L. REV. 423, 446-47 (1995).

¹⁵⁸ Phillip Areeda & Donald F. Turner, *Predatory Pricing and Related Practices Under Section 2 of the Sherman Act*, 88 HARV. L. REV. 697, 700-01 (1975).

¹⁵⁹ *Id.* at 700.

¹⁶⁰ See 2A PHILLIP E. AREEDA ET AL., ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION ¶ 395, at 385 (3d ed. 2007).

¹⁶¹ See *id.* (giving examples of other factors that might cause a rise in prices, such as increased wages due to a new labor contract or regulatory changes).

2000,¹⁶² but Figure 5 adds a second line representing variable costs. The gap between price and average variable costs is narrow during the period of market competition between 1998 and 2000 compared to the period afterward, when the alleged conspiracy may have restarted. After the cartel potentially resumed its illegal activity, prices increased. Those price increases may be explained in part by increases in average variable costs. However, the increased gap between the price and the higher average variable costs might also be consistent with an effective conspiracy after 2000. Alternative explanations might be possible, such as an important competitor exiting around 2000; such an exit would result in higher profit margins for the remaining firms, even if those firms did not conspire.

Figure 5: Revenue and Total Variable Costs (Per Unit)

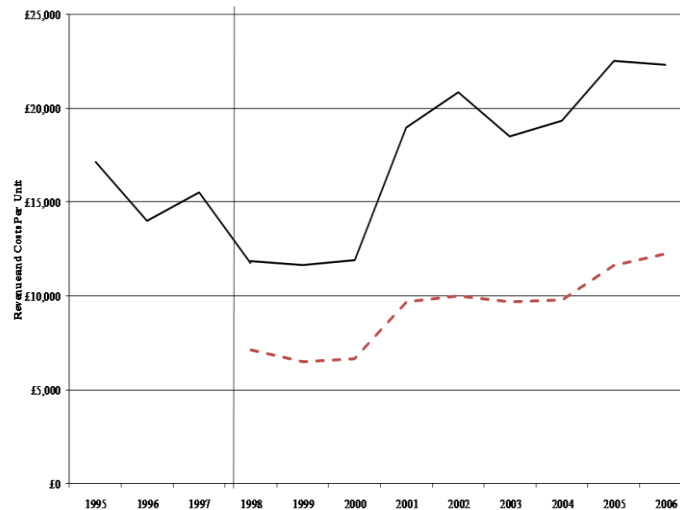


Figure 6 shows the same result from the perspective of the variable contribution margin.¹⁶³ The variable contribution margin is the dollar variable profit margin per unit (i.e., revenue per unit less variable costs per unit) divided by revenue per unit.¹⁶⁴ When revenue per unit increases and variable costs stay the same or go up more than cost (as is the case in an effective price-fixing conspiracy), the variable contribution margin also increas-

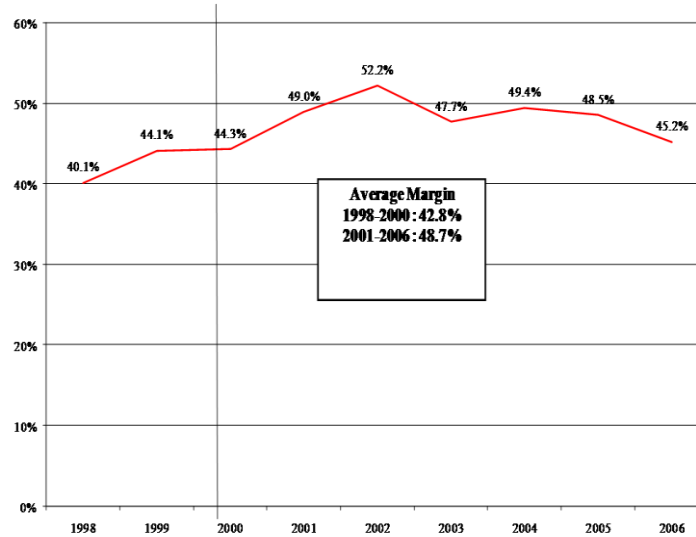
¹⁶² Recall that the flat portion of the graph represents the price war that ensued when the cartel collapsed. See *supra* Part II.B.2.

¹⁶³ See Connor, *supra* note 140, at 51-52 & figs.4-5 (explaining that contribution margins can vary substantially by industry, but they typically include net sales less variable costs such as materials costs; direct-production labor; direct-production overhead; semi-fixed overhead like research and development, quality control, laboratory costs, and engineering costs; commissions and freight; and changes in labor and overhead-stock movement).

¹⁶⁴ For example, if revenue per unit is \$10 and variable costs per unit are \$6, then the variable contribution margin is 40 percent (i.e., a \$4 per unit variable profit divided by \$10 in revenues per unit).

es. In the example in Figure 6, the variable contribution margin averages 42.8 percent during the 1998-2000 price war, then increases starting in 2001 when the cartel allegedly resumed its collusive behavior. The variable contribution margin averages 48.7 percent during 2001-2006; this significant increase suggests that the conspiracy was effective during that period.

Figure 6: Variable Contribution Margin



Analyzing changes in variable contribution margins allows an economist to adjust but-for prices for changes in costs. Contribution margins account for the potential short-term impact of variable cost shifts on prices, thereby potentially isolating the price impact that is specifically due to the conspiracy.¹⁶⁵

b. *Adjusting for Multiple Factors that May Impact Prices*

Market outcomes are determined by a complex array of market factors relating to both the demand and the supply for a product, so a potentially wide range of variables can affect price.¹⁶⁶ Economists estimating damages in civil antitrust cases therefore often use econometric and other statistical techniques to adjust for various factors that might reasonably impact prices in a market.¹⁶⁷ A commonly used and well-accepted statistical technique is

¹⁶⁵ See Peter B. Frank & Michael J. Wagner, *Computing Lost Profits and Reasonable Royalties*, 15 AIPLA Q.J. 391, 401-02 (1987).

¹⁶⁶ PROVING ANTITRUST DAMAGES, *supra* note 1, at 125.

¹⁶⁷ See *id.* at 125-26.

regression analysis.¹⁶⁸ Regression analysis can be used to isolate the separate impact of several independent influences on prices, including the impact of the alleged conspiracy.¹⁶⁹

Basic regression analysis describes a linear relationship between two variables that influence each other.¹⁷⁰ Figure 7¹⁷¹ illustrates how a simple regression analysis estimates a relationship between two variables. In this case, cost is an independent variable that influences price, the dependent variable.¹⁷² As shown in Figure 7, regression analysis finds the best fit of a line that maps the relationship between cost and price based on available data. The “best fit” straight line in this example has a slope of 0.90,¹⁷³ so on average, 90 percent of a cost increase will be passed on to customers by way of higher prices.¹⁷⁴ According to the regression analysis conducted in Figure 7, if the cost of a good increases by \$1, the price will increase by \$0.90.¹⁷⁵

¹⁶⁸ *In re* Ethylene Propylene Diene Monomer (EPDM) Antitrust Litig., 256 F.R.D. 82, 95 (D. Conn. 2009) (“[Regression analysis] is used frequently in employment discrimination and antitrust lawsuits. . . . The Supreme Court has already accepted the use of multiple regression analysis in employment discrimination suits.”); *Ohio ex rel. Montgomery v. Louis Trauth Dairy, Inc.*, 925 F. Supp. 1247, 1252 (S.D. Ohio 1996) (“Econometric and regression analyses are generally considered reliable disciplines.” (citing *Petruzzi’s IGA Supermarkets v. Darling-Del. Co.*, 998 F.2d 1224, 1238 (3d Cir. 1993))).

¹⁶⁹ See Cremieux et al., *supra* note 87, at 944-45 (“In the context of suspected cartel pricing behavior, economists use regression methods to identify various non-collusive factors that may affect the prices paid by members of the proposed class and isolate the potentially common effect of a horizontal conspiracy.”); cf. *Bazemore v. Friday*, 478 U.S. 385, 400 (1986) (Brennan, J., concurring in part) (per curiam) (“Normally, failure to include variables will affect the [regression] analysis’ probativeness, not its admissibility.”).

¹⁷⁰ Cremieux et al., *supra* note 87, at 946. A simple regression equation expresses the dependent variable, y , as a function of the independent variable, x . *Id.* For example, price may depend on the properties of a given product, but those properties do not change. *See id.* A regression equation also accounts for factors that remain constant even when price changes, such as fixed production costs (“ a ”); the factor that describes the relationship between x and y (“ b ”); and an error (“ e ”): $y = a + bx + e$, for each set of data points. *Id.* The analyst inputs the available data from the dependent variable, the fixed factor, and the error into the equation, solving for b . *See id.* The variable b correlates with the slope of the line on linear graph of the data. *See id.* Regression analysis seeks to identify the value of b for which the line best fits all of the values of x and y . *See* Cremieux et al., *supra* note 87, at 946.

¹⁷¹ PROVING ANTITRUST DAMAGES, *supra* note 1, at 134.

¹⁷² Price is a function of cost. A similar type of analysis can also be done using profit as the dependent variable instead of price.

¹⁷³ *See supra* note 170.

¹⁷⁴ *See* PROVING ANTITRUST DAMAGES, *supra* note 1, at 133.

¹⁷⁵ *See id.*

Figure 7: Example Regression Line Fit: Price as a Function of Cost

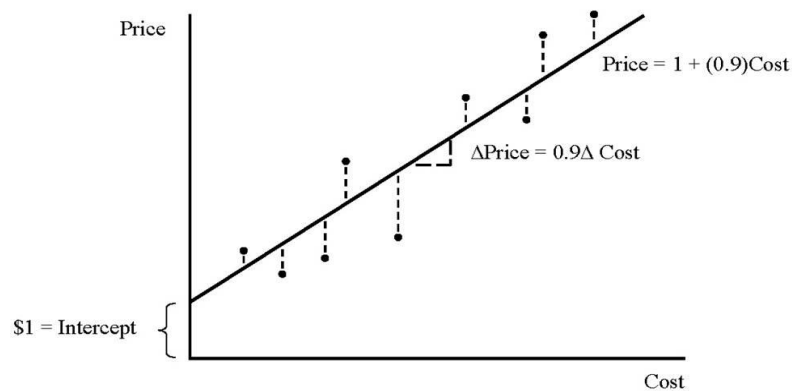


Figure 1

In addition to illustrating the relationship between two variables, regression analysis can also describe the relationship between a group of independent variables and a dependent variable.¹⁷⁶ Regression analysis can estimate the partial effect of each independent variable, including the separate impact of the alleged conspiracy, on the price.¹⁷⁷ Based on the regression data, the economist can determine if the alleged conspiracy had a positive—and statistically significant—effect on prices.¹⁷⁸ If so, the economist can use the estimated price increase to calculate what damage resulted specifically from the alleged conspiracy.¹⁷⁹

4. Natural-Experiment Analysis

Another commonly used technique to isolate the impact of allegedly improper acts uses so-called “natural experiments” as a benchmark to estimate but-for market outcomes.¹⁸⁰ Natural experiments are actual market experiences, either within the market at issue or in other related markets,

¹⁷⁶ See *id.* at 132.

¹⁷⁷ See *id.* at 131.

¹⁷⁸ See *id.* at 131-32.

¹⁷⁹ *Id.* at 130, 132.

¹⁸⁰ Mary Coleman & James Langenfeld, *Natural Experiments*, in 1 ISSUES IN COMPETITION LAW AND POLICY 743, 743-44 (ABA Section of Antitrust Law 2008).

that provide information on the likely outcomes in the but-for world.¹⁸¹ Natural experiments typically involve two markets: the experimental group and the control group.¹⁸² For the natural experiment to work, these groups should be similar to each other except that the experimental market has experienced a particular event.¹⁸³

Natural-experiment analysis is reliable as long as the experiment is sufficiently similar to the market or time period at issue and the major difference between the benchmark and the market or time period at issue is the existence of the allegedly anticompetitive act.¹⁸⁴ For example, two distinct geographic areas may have similar supply-and-demand conditions for a product, and that product might be sold in both, but an alleged conspiracy occurred in only one of the areas. In such a case, the analyst might compare changes in prices or profit margins in the geographic area where the alleged conspiracy occurred (the experimental group) with the same information from the geographic areas without any alleged conspiracy (the control group).

In *Federal Trade Commission v. Staples, Inc.*,¹⁸⁵ the Federal Trade Commission (“FTC”) used a natural experiment to predict the effects of a proposed merger between Staples and Office Depot.¹⁸⁶ In *Staples*, the FTC compared prices for a group of office products sold by both Staples and Office Depot in various geographic areas; the key difference between the areas was whether or not the two firms competed against one another.¹⁸⁷ The FTC’s data showed that geographic areas in which Staples competed with Office Depot had lower office supply prices than areas where the two stores did not compete, all other things being equal.¹⁸⁸ Based on its analysis, the FTC predicted that a merger of Staples and Office Depot would lead to higher prices in the geographic areas where they had once been competitors.¹⁸⁹ The *Staples* court held that the FTC’s evidence, which included company documents, supported a presumption that permitting the merger would substantially increase the prices of office supply products.¹⁹⁰

In *Staples*, the FTC used its estimates of the difference between prices in the “competitive” markets (i.e., the areas with both a Staples and Office Depot, competing with each other) and the “noncompetitive” markets (the

¹⁸¹ *See id.*

¹⁸² *See id.* at 747.

¹⁸³ *See id.* at 746-47.

¹⁸⁴ *See id.* at 743-47.

¹⁸⁵ 970 F. Supp. 1066 (D.D.C. 1997).

¹⁸⁶ *Id.* at 1075.

¹⁸⁷ *Id.*; Coleman & Langenfeld, *supra* note 180, at 744-47.

¹⁸⁸ *Staples*, 970 F. Supp. at 1075-76.

¹⁸⁹ *Id.* at 1082-83.

¹⁹⁰ *Id.* at 1076, 1082-83. The *Staples* court found that the evidence Staples provided to rebut the presumption was inadequate, and after balancing public and private equities, the court granted the FTC’s motion for a preliminary injunction to block the merger. *Id.* at 1090-93.

areas with they did not compete) to predict the potential pricing impact if the merger did occur.¹⁹¹ A similar analysis can be done in antitrust conspiracy cases, since antitrust damage calculations can compare market outcomes in geographic markets with and without the alleged conspiracy.¹⁹²

5. The Potential Time and Cost Involved in Estimating Damages

As discussed in the hypothetical examples above, the level of necessary sophistication and detail can vary considerably in damage analyses depending on the particular allegations, the industry, and the available data.¹⁹³ In some cases, a reasonable estimate of damages can be developed using a relatively straightforward model (e.g., a contribution-margin analysis) and using data that is readily available from the defendants.¹⁹⁴ Such analyses might be performed in a relatively cost-efficient manner and can be completed relatively quickly. In some cases, for example, the alleged conspiracy may have impacted all customers in a similar way, and the economist may use aggregated data to make a reasonable estimate of damages to all the customers.

Other cases may require a more sophisticated approach, particularly if there is a potentially wide difference in impact across numerous customers that cannot be easily grouped on the basis of similar impact.¹⁹⁵ Obtaining the data necessary to make reasonable economic inferences may be costly and time-consuming in these cases. Deciding whether to use economic damage analysis in a particular criminal antitrust case requires considering the likely time and cost for an economist to make a reliable estimate of damages.

Economists can also make some economically based assumptions to perform a more streamlined form of damage analysis and provide a rough estimate of damages or an estimate of a range of damages; either of which is likely to be more accurate than the USSG formula.¹⁹⁶ For example, if there is evidence that the primary factor affecting prices in an industry during the period of an alleged conspiracy was variable costs, then a VOC calculation could reasonably focus on changes in variable margins. A margin

¹⁹¹ *Id.* at 1075-76, 1079-80, 1082.

¹⁹² See PROVING ANTITRUST DAMAGES, *supra* note 1, at 206-07 (discussing the “yardstick” method in which plaintiffs allege a conspiracy in one geographic market and use pricing trends to compare that geographic market to markets in other parts of the country that were presumably not impacted by the alleged cartel (internal quotation marks omitted)).

¹⁹³ See *supra* Parts II.B.1-4.

¹⁹⁴ See *supra* Part II.B.3.a.

¹⁹⁵ See Cremieux et al., *supra* note 87, at 953.

¹⁹⁶ See Julia Schiller et al., *Towards Convergence: The Volume of “Affected” Commerce Under the U.S. Sentencing Guidelines and “Impact” Analysis Under the Clayton Act*, 18 GEO. MASON L. REV. 987, 994-95 (2011).

analysis in this case could provide a more accurate measure of VOC than the USSG's formula in that situation, and it would not likely impose significant costs or delay.

C. Summary

Economists already use a wide variety of accepted techniques to make reliable damage measurements in civil antitrust cases.¹⁹⁷ The same calculations can be applied to criminal conspiracy cases to estimate the VOC.¹⁹⁸ However, antitrust damage estimates can be costly and time consuming,¹⁹⁹ so it is important to consider the time and cost of those calculations, as well as whether an economist can streamline the analyses by making well-founded assumptions.

III. POLICY CONSIDERATIONS IN USING ANTITRUST CIVIL DAMAGE ANALYSES IN CRIMINAL ANTITRUST CASES

Deciding whether to apply the damage analyses common in civil antitrust cases to criminal cases involves considering the benefit of a more accurate VOC measure compared to the increased administrative costs to obtain that benefit. Economic damage analysis can give a more precise measure of the VOC associated with a criminal conspiracy, which allows courts and enforcers to impose fines at more optimal, accurate levels.²⁰⁰ Optimal fine levels that reflect the actual market impact from criminal price-fixing conspiracies can avoid the errors associated with either excessively low fine levels (which fail to deter conspiratorial behavior),²⁰¹ or excessively high fine levels (which may substantially raise industry costs and inhibit cooperation that aids consumers).²⁰²

But the use of economic damage analysis instead of the USSG's simple guidelines in criminal antitrust cases will likely raise administrative costs, and collecting and analyzing the necessary data can potentially cause

¹⁹⁷ See *supra* Part II.B.

¹⁹⁸ See Schiller et al., *supra* note 196, at 1010.

¹⁹⁹ *Id.* at 994-95.

²⁰⁰ See William M. Landes, *Optimal Sanctions for Antitrust Violations*, 50 U. CHI. L. REV. 652, 656 (1983) (positing that the optimal damage award in an antitrust case "should equal the net harm to a person other than the offender").

²⁰¹ See Scott D. Hammond, *The Evolution of Criminal Antitrust Enforcement Over the Last Two Decades*, in THE 24TH ANNUAL NATIONAL INSTITUTE ON WHITE COLLAR CRIME K-165, K-167 (2010).

²⁰² See Landes, *supra* note 200, at 655 & n.4.

delays.²⁰³ If such time and money investments do not substantially improve the accuracy of fines, then they are presumably not worthwhile. However, if damage analyses can achieve their goal at reasonable cost, the increased administrative costs of such undertakings are justifiable relative to the benefits of accuracy. As a compromise, simplified or streamlined forms of economic damage calculations might provide more precise measures of VOC and fine levels than the USSG does, without substantially increasing administrative costs.

Taking all of these factors into consideration, antitrust damage analyses in criminal antitrust cases can be cost beneficial when:

- * The potential VOC is relatively large (e.g., in the hundreds of millions of dollars);
- * There is substantial uncertainty as to the actual size of the VOC; and
- * There is sufficient reliable data and other information that permit at least some of the various damages-estimation techniques to be implemented effectively.

Several policy considerations arise that relate to the use of economic damage analysis in criminal antitrust conspiracy cases. For example, setting criminal penalties at the proper level is critical to achieving optimum deterrence. Courts must also weigh the costs of more rigorous economic analysis with the benefits of the more accurate calculations.

A. *Optimal Deterrence*

Enforcers can design financial penalties in antitrust cases for optimal deterrence of future anticompetitive behavior.²⁰⁴ From an economic perspective, deterrence is a function of the expected benefits and costs of engaging in anticompetitive behavior.²⁰⁵ That is, a potential conspirator will weigh the expected benefits from an illegal conspiracy against the expected costs.²⁰⁶ The benefits involve the expected increase in profits from the illegal conspiracy, which reflect an anticipated price increase and the likelihood that the other cartel members will do their part to raise prices and reduce

²⁰³ Cf. U.S. SENTENCING GUIDELINES MANUAL § 2R1.1 cmt. n.3 (2010) (noting that the purpose of the easy calculations provided in the USSG is to “avoid the time and expense that would be required for the court to determine the actual gain or loss”).

²⁰⁴ See Connor & Lande, *supra* note 30, at 516-17 (citing Landes, *supra* note 200, at 656).

²⁰⁵ See *id.* at 520 & n.35. See the classic article on the economics of criminal punishment, Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169 (1968), for additional background.

²⁰⁶ See Becker, *supra* note 205, at 207-08.

output.²⁰⁷ The expected costs are a function of two factors: the likelihood of being caught and the expected penalty if one is caught.²⁰⁸

A substantial percentage of criminal antitrust behavior may go undetected,²⁰⁹ so some scholars argue that optimal fine levels should significantly exceed actual damages in order to restore equilibrium.²¹⁰ If antitrust conspirators suspect that there is a chance they will not be caught, then to achieve sufficient deterrence, enforcers must impose a multiplication factor that increases criminal fines.²¹¹ For example, if potential conspirators believe they have only a one-in-four chance of being caught, they will only be deterred by a fine equal to four times the actual damage their collusion causes.²¹² If there were no multiplier, or if it were less than four, the potential conspirator would have a profit-maximizing incentive to fix prices. On the other hand, if the multiplier were greater than four, then the potential conspirator would have an incentive to use significant resources to avoid even the slightest possibility of being accused of an anticompetitive conspiracy.²¹³

It is important to recognize that the costs of overdeterrence can be as significant as those of underdeterrence. For example, many industries have trade associations that share important technical and regulatory developments, an exchange that benefits both association members and their cus-

²⁰⁷ See Connor & Lande, *supra* note 30, at 520 & n.35.

²⁰⁸ See *id.*

²⁰⁹ See *id.* at 519.

²¹⁰ E.g., *id.* at 525 (commenting “that the standard optimal deterrence model means that “[t]he optimal crime [fine] for any given act [of price-fixing is] equal to the damage caused by the violation divided by the probability of convictions” (alterations in original) (quoting *Sentencing Options: Hearing Before the U.S. Sentencing Comm’n* (July 15, 1986), in UNITED STATES SENTENCING COMM’N: UNPUBLISHED PUBLIC HEARINGS 1986, at 15 (1988) [hereinafter *Sentencing Hearing*] (statement of Douglas Ginsburg, Assistant Att’y Gen. for Antitrust, U.S. Dep’t of Justice)). Former AAG Douglas Ginsburg commented that “price-fixing typically . . . harm[s] the consumers in a range of 10 percent of the price,” but that cartels had no more than a 10 percent chance of being detected. *Id.* (quoting *Sentencing Hearing, supra*, at 15). As such, the damages for a cartel violation should be 10 times the overcharge. *Id.* at 525 n.65. Instead, the USSG mandates a mere doubling of its estimate of the overcharge. U.S. SENTENCING GUIDELINES MANUAL § 2R1.1(d)(1) (2010).

²¹¹ See Connor & Lande, *supra* note 30, at 519.

²¹² Suppose a potential conspirator stands to gain \$100 million in overcharges from anticompetitive behavior. If that conspirator expected that there was a 25 percent (one in four) chance of being caught, then a multiplier of four (one divided by .25) would be necessary to deter collusive behavior.

²¹³ However, with the current amnesty policies, increased fine levels, and international cooperation in policing cartels, the relevant question may be when and not whether a conspiracy is detected. As one DOJ official recently noted, “In the last two decades, the world has seen a proliferation of effective leniency programs, ever-increasing sanctions for cartel offenses, a growing global movement to hold individuals criminally accountable, and increased international cooperation among enforcers in cartel investigations.” Hammond, *supra* note 201, at K-165. The DOJ official also noted that the Antitrust Division typically has approximately fifty internal cartel investigations open at a time, and more than half of these investigations were initiated, or are being advanced by information from a leniency applicant. *Id.* at K-166.

tomers.²¹⁴ If a member of such an association is accused of antitrust violations, communications at these meetings may be provided as evidence of a conspiracy.²¹⁵ The fact that these discussions may qualify as incriminating evidence does not suggest that all trade associations should be banned. However, if fines are so excessive that they penalize all behavior that might be seen in any way as being anticompetitive, then companies may lose the incentive to take part in any trade association activities.

Most agree the punishment should be in proportion to the impact of the crime—otherwise, underdeterrence or overdeterrence will result.²¹⁶ Some antitrust scholars argue that to be optimal, deterrence should balance the overall expected benefits of engaging in anticompetitive behavior, which led to the notion of imposing treble damages in civil antitrust cases.²¹⁷ Furthermore, achieving an appropriate level of deterrence may have been a primary goal when the U.S. Sentencing Commission developed financial penalties under the USSG.²¹⁸

If these theories are correct, then accurate VOC calculation is crucial to achieve optimal deterrence.²¹⁹ If the calculation underestimates the true VOC, then there is risk of underdeterrence,²²⁰ and an inappropriately large VOC produces a risk of overdeterrence.²²¹ Economic damage analysis can improve the accuracy of VOC calculations, allowing courts and enforcers to levy more appropriate—and more effective—fines in criminal antitrust cases.

²¹⁴ See CARLTON & PERLOFF, *supra* note 145, at 653.

²¹⁵ See *id.* (citing *Am. Column & Lumber Co. v. United States*, 257 U.S. 377 (1921)).

²¹⁶ See Landes, *supra* note 200, at 654-55 (discussing deterring collusion by using a fine equal to the social cost of a cartel).

²¹⁷ See Spencer Weber Waller, *The Incoherence of Punishment in Antitrust*, 78 CHI.-KENT L. REV. 207, 211 (2003) (quoting PHILLIP AREEDA & DONALD F. TURNER, *ANTITRUST LAW* 149-50 (1978)).

²¹⁸ See Connor & Lande, *supra* note 30, at 524-25 (noting that the Sentencing Commission probably adopted the optimal-deterrence model for cartel fines because the then head of the Antitrust Division, Douglas Ginsburg, judged that price fixing usually “harmed the consumers in a range of 10 percent of the price” (quoting *Sentencing Hearing*, *supra* note 210, at 15)); ANTITRUST MODERNIZATION COMM’N: REPORT AND RECOMMENDATIONS 300-01 (2007), available at http://govinfo.library.unt.edu/amc/report_recommendation/amc_final_report.pdf (“The empirical data available at the time showed that price-fixing overcharges tended to be about 10 percent of the volume of affected commerce.”).

²¹⁹ This is because the first step in calculating a fine for an illegal cartel is to determine the “Base Fine,” which is 20 percent of the volume of affected commerce. U.S. SENTENCING GUIDELINES MANUAL § 2R1.1(d)(1) (2010).

²²⁰ See Connor & Lande, *supra* note 30, at 561 (arguing that the USSG base fines “will do little to deter most . . . cartels” because they are based on presumptions that significantly underestimate the overcharge on affected commerce).

²²¹ See Landes, *supra* note 200, at 655 & n.4 (“[L]arge fines can deter socially valuable business behavior.”).

B. *The Benefits and Costs of Antitrust Damage Analyses in Criminal Antitrust Cases*

Determining the costs and benefits of more accurate VOC measurements involves answering several key questions:

- * What is the potential size of the VOC?
- * Is the size of the VOC subject to substantial variation based on the alleged violations and market conditions?
- * Is the damage analysis likely to improve measurement of the VOC substantially?
- * What is the likely time and cost necessary to conduct a reliable damages estimate?
- * Can the damage estimate be reasonably and usefully streamlined if necessary?

When the potential size of the VOC is quite large (e.g., in the hundreds of millions of dollars), the implications of over- or underestimating VOC can have a substantial impact on a large amount of commerce and many consumers. The cost of increasing the accuracy of the estimated VOC in these circumstances may be relatively small compared to the potential impact on customers and firms, so by comparison, the cost of damage analyses would be justifiable when the potential size of the VOC is large.

In addition, when economic conditions in an industry are volatile or questions arise about what fraction of the firms' sales the violation actually affected, then the USSG's simple VOC calculations are more likely to be inaccurate.²²² For example, if there were frequent collapses or substantially long periods without cartel activity during the overall period of the alleged conspiracy, then economic damage analyses may help to identify those time periods during which the conspiracy actually had an impact.²²³ Such an analysis may substantially decrease the VOC, since fewer transactions would be included in the "affected" commerce.

When there is little—or no—sufficiently accurate data, then there is little benefit to performing economic damage analyses compared to the

²²² See Mutchnik et al., *supra* note 7, at 2-3 (citing *United States v. Andreas*, 216 F.3d 645 (7th Cir. 2000), *United States v. SKW Metals & Alloys, Inc.*, 195 F.3d 83 (2d Cir. 1999), and *United States v. Hayter Oil Co.*, 51 F.3d 1265 (6th Cir. 1995)) (describing the complexities that can arise in proving how much commerce was actually affected).

²²³ See Yuliya Bolotova et al., *The Impact of Collusion on Price Behavior: Empirical Results From Two Recent Cases*, 26 INT'L J. INDUS. ORG. 1290, 1302 (2008) (noting that analysis of price variance can be an additional tool to identify conspiracies that might not cause large price increases); see Schiller et al., *supra* note 196, at 1002, 1004-06 (noting that in light of the substantial amount of cheating in cartels, the government's 20 percent overcharge presumption should be reconsidered, and advocating the use of econometric impact analysis in some criminal cases).

USSG's simpler formulaic approach. For example, if the alleged price-fixing conspiracy occurred well in the past, and there is sparse pricing information for the affected period, then reliable damage analyses may not be feasible. The calculations might also be difficult if the only available pricing data are not specific enough to the products or services that are allegedly the subject of a conspiracy.²²⁴ In such cases, courts could rely on the USSG's default calculations.

If the available data is adequate, however, economic damage analysis techniques can be applied directly and efficiently to the information, and they will likely improve the estimation of VOC compared to the USSG formulas without creating substantial costs or delays.²²⁵ This is particularly true if a limited number of significant and identifiable factors influence the prices and sales. For example, if the producer's costs were the primary variable that impacted prices during the alleged conspiracy, then a contribution-margin analysis²²⁶ may be sufficient to generate a reliable estimate of damages. Such a calculation may be relatively simple and may not significantly increase the administrative cost of estimating VOC.

In deciding whether to rely on the USSG's simple framework or to invest in the higher costs of economic damage analysis, courts should determine whether the economist can make assumptions and perform a more streamlined damage analysis.²²⁷ An economist might conduct sensitivity analyses to see which assumptions most substantially affect the VOC.²²⁸ Such calculations would identify which key assumptions should be investigated further; by focusing on the assumptions that have the greatest effect, the economist can decrease the cost of obtaining the most reliable estimate of VOC.²²⁹

CONCLUSION

Booker v. United States has relegated the USSG to an advisory role in criminal antitrust sentencing, so economic damage analyses may now be applied in criminal antitrust cases.²³⁰ Economic antitrust damage analysis methods may increase the accuracy of VOC estimates, which would lead to

²²⁴ See *supra* Part II.A (explaining how a plaintiff's expert would need specific data showing that the plaintiff bought only from a particular defendant in a customer-allocation conspiracy).

²²⁵ See *supra* Part II.B.5.

²²⁶ See *supra* Part II.B.3.a (describing contribution margin analysis).

²²⁷ See *supra* Part II.B.5.

²²⁸ See *supra* Part II.B.3.b (explaining how regression analysis can isolate factors in antitrust damage calculations).

²²⁹ For example, if a sensitivity analysis revealed that cost most substantially affected the VOC, an economist could use a contribution-margin analysis to estimate VOC. Such an analysis would be reliable, yet not as complicated as a full-blown econometric analysis of various factors.

²³⁰ *United States v. Booker*, 543 U.S. 220, 245-46 (2005).

criminal penalties that are consistent with the impact of the alleged conspiracy. However, these estimations of damages will require more rigorous analyses than the mechanical calculations under the USSG. There is a trade-off between the relatively low administrative cost of using the simpler USSG approach for estimating VOC and the increased cost of the potentially more accurate economic approach. Economic analyses of antitrust damages are most appropriate in criminal antitrust cases when the potential VOC is relatively large, there is uncertainty regarding the actual size of the VOC, and the economist has adequately reliable data to perform at least some of these damage estimation techniques effectively.