

DETECTION AVOIDANCE

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ABSTRACT: In practice, the problem of law enforcement is half a matter of what the government does to catch violators and half a matter of what violators do to avoid getting caught. In the theory of law enforcement, however, although the state's efforts at "detection" play a decisive role, offenders' efforts at "detection avoidance" are largely ignored. Always problematic, this imbalance has become critical in recent years as episodes of corporate misconduct spur new interest in punishing process crimes like obstruction of justice and perjury. This article adds detection avoidance to the existing theoretical frame with an eye toward informing the current policy debate. The exercise leads to several conclusions. First, despite recent efforts to strengthen laws governing obstruction and perjury, sanctioning is relatively inefficacious at discouraging detection avoidance. Sanctions send a mixed message to the offender: do less to avoid detection, but to the extent you still do something, do more to avoid detection of your detection avoidance. The article argues that detection avoidance is more effectively deterred through the structural design of evidentiary procedure (inclusive of investigation). Specifically advocated are devices that exploit the cognitive shortcomings of potential avoiders and the strategic instability of their cooperative arrangements, thereby lowering the cost effectiveness of devoting resources to avoiding detection.

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People who violate the law go out of their way to avoid getting caught. This is one of the defining features of law enforcement. It must have been present in the primordial pools of social organization. And in the complexity of modern criminal and regulatory administration, it remains among the most basic of organic formulae.

Unfortunately, it has never been a defining feature of our *understanding* of law enforcement.¹ Our theories of crime and regulation view evidence too much as something that investigators uncover, and not enough as something that violators cover up. Our theories of evidence and procedure focus too much on wrongdoing as the subject of evidence, and not enough on evidence as the object of wrongdoing. A curricular crevasse marks the spot that ought to be occupied by an integrated approach accounting for *both* “detection”—a term of art encompassing investigation, prosecution, and liability—and “detection avoidance.”

The divergence between theory and reality in this area has become all the more apparent and urgent in recent years as events such as those at Enron,² WorldCom,³ and HealthSouth⁴ reverberate through Congress, administrative agencies, and the courts.⁵ Episodes of evidentiary foul play often form crucial subplots in these dramas of corporate malfeasance.⁶ Process crimes have accordingly been swept up in the “get tough” policy posture that such events have fostered.

¹ Part II discusses the relevant literature in detail.

² See, e.g., Superseding Indictment, United States v. Causey, (S.D. Tex. 2004) (H-04-25 (S-2)) (describing alleged financial fraud at Enron); Carrie Johnson, *Skilling, Lay Cases Build on Plea Deals*, WASH. POST, Sep. 17, 2004, at E01 (listing guilty pleas in related prosecutions).

³ Superseding Indictment, United States v. Ebberts, (S.D.N.Y. 2004) (S3 02 Cr. 1144) (detailing financial fraud at WorldCom); Ken Belson, *Ex-Chief of WorldCom Is Found Guilty in \$11 Billion Fraud*, N.Y. TIMES, March 16, 2005, at A1 (reporting conviction).

⁴ Superseding Indictment, United States v. Scrusby, (N.D. Ala. 2004) (CR-03-BE-0530-S) (describing alleged fraud at HealthSouth). Scrusby was acquitted. Simon Romero & Kyle Whitmire, *Former Chief of HealthSouth Acquitted in \$2.7 Billion Fraud*, N.Y. TIMES, June 29, 2005, at A1. But seventeen of his subordinates pled guilty. Milt Fruedenheim, *New Indictment for Ex-Chief of HealthSouth*, N.Y. TIMES, Sept. 30, 2004, at C5. Moreover, as of this writing, the SEC plans to continue prosecuting its civil suit against Scrusby, which was stayed during the criminal trial. Commission’s Response to Order to Show Cause, SEC v. HealthSouth, (N.D. Ala. 2005) (03-J-0615-S).

⁵ See generally DAVID SKEEL, *ICARUS IN THE BOARDROOM: THE FUNDAMENTAL FLAWS IN CORPORATE AMERICA AND WHERE THEY CAME FROM* (2005) (reviewing recent corporate scandals in historical context).

⁶ See, e.g., Arthur Andersen, LLP v. United States, 125 S. Ct. 2129, 2131-2135 (2005) (describing conviction of Enron’s auditor, Arthur Andersen under 18 U.S.C. § 1512(b) for “corruptly persuading” others to alter and destroy audit-related documents; reversing and remanding for overbroad jury instructions); Superseding Indictment, United States v. Scrusby (Indicting HealthSouth CEO, Richard Scrusby under 18 U.S.C. §1621 for lying to SEC investigators and under 18 U.S.C. §1512(b) for attempting to persuade a subordinate to give false testimony). *But see* U.S. v. Scrusby, (N. D. Ala, April 15, 2005) (CR-03-BE-0530-S) (mem. and order) (dismissing §1621 charges); Kyle Whitmire, *As Deliberations Near in Fraud*

Congress's chief response to corporate misconduct, the Sarbanes-Oxley Act,⁷ passed in July 2002, includes several provisions broadening the definition of obstruction of justice.⁸ The Act also directs the U.S. Sentencing Commission to conduct an emergency⁹ review of the penalties for obstruction to insure that they are "sufficient to deter and punish."¹⁰ The Commission responded in January 2003 by effectively doubling the (now advisory¹¹) sentence for substantially obstructive acts.¹²

Correspondingly, "strengthening laws to crack down on obstruction of justice" makes the short list of Bush administration proposals to restore "corporate responsibility."¹³ The administration's Corporate Fraud Task Force¹⁴—a "financial crimes SWAT team"¹⁵ comprised of the nation's top regulatory and enforcement personnel¹⁶—has explicitly taken aim at evidentiary misbehavior. The category "obstruction of justice, perjury, witness tampering or other obstructive behavior" rounds out "falsification of ... financial information" and "self-dealing" in the Task Force's tripartite definition of its eponym, "corporate fraud."¹⁷ Task Force members

Case, Scrushy Lawyers Win Dismissal of Two Counts, N.Y. TIMES, May 13, 2005, at C5 (describing dismissal of §1512(b) charges).

⁷ Sarbanes-Oxley Act of 2002, Pub. L. No. 107-204, 116 Stat. 745 (codified in scattered sections of 11, 15, 18, 28, and 29 U.S.C.A. (West Supp. 2003)).

⁸ Sarbanes-Oxley Act §§ 802 (codified as 18 U.S.C. §§ 1519 and 1520) and 1102 (codified as 18 U.S.C. § 1512(c)).

⁹ Sarbanes-Oxley Act §§ 805(b), 1104(a),(c).

¹⁰ Sarbanes-Oxley Act §§ 805(a), 1104(a)(4).

¹¹ *United States v. Booker*, 125 S. Ct. 738, 756-757 (2005) (holding Federal Sentencing Guidelines "effectively advisory" rather than mandatory).

¹² The Commission increased the base level for obstruction of justice and obstruction related offenses (including perjury) from 12 to 14. U.S. SENTENCING GUIDELINES MANUAL §§ 2J1.2(a), 2J1.3(a) (2004). It also added a new two level enhancement for offenses "extensive in scope, planning, or preparation." *Id.* §2J1.2(a). See also U.S. SENTENCING COMM'N, REPORT TO THE CONGRESS: INCREASED PENALTIES UNDER THE SARBANES OXLEY ACT OF 2002 2003, available at http://www.uscc.gov/r_congress/S-Report.pdf, at ii-iii (describing combined effect of sentencing changes).

¹³ CORPORATE FRAUD TASK FORCE, FIRST YEAR REPORT TO THE PRESIDENT 1.4 (July 22, 2003) [hereinafter CORPORATE FRAUD TASK FORCE FIRST YEAR REPORT], available at http://www.usdoj.gov/dag/cftf/first_year_report.pdf.

¹⁴ Exec. Order No. 13,271, 67 FED. REG. 46,091 (July 9, 2002) (establishing Corporate Fraud Task Force); CORPORATE FRAUD TASK FORCE FIRST YEAR REPORT, *supra* note 13 at 1.2 ("Since its creation the Task Force has coordinated and overseen all corporate fraud matters under investigation by the Department of Justice and enhanced inter-agency coordination of regulatory and criminal investigations.")

¹⁵ President George W. Bush, Remarks by the President on Corporate Responsibility at the Regent Wall Street Hotel, New York, New York (July 9, 2002), reprinted in 38 WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS 1158-61 (July 15, 2002).

¹⁶ Members include the Chairman of the SEC, the Director of the FBI, the Secretary of the Treasury, high level officials in the Department of Justice, and United States Attorneys from key urban areas. CORPORATE FRAUD TASK FORCE FIRST YEAR REPORT, *supra* note 13, at back of title page; see also CORPORATE TASK FORCE, SECOND YEAR REPORT TO THE PRESIDENT back of title page (July 20, 2004), available at http://www.usdoj.gov/dag/cftf/2nd_yr_fraud_report.pdf.

¹⁷ CORPORATE FRAUD TASK FORCE FIRST YEAR REPORT, *supra* note 13, at 2.2 n.1.

publicly profess to “have understood Congress’s clear mandate that they aggressively pursue obstructive conduct.”¹⁸

That understanding appears to have been actualized in several high profile convictions. In June 2002, for instance, the accounting firm Arthur Anderson was convicted of obstruction of justice for destroying audit-related documents on the eve of an SEC investigation into its treatment of Enron’s special purpose entities (though the U.S. Supreme Court reversed and remanded for overbroad jury instructions in May 2005).¹⁹ Martha Stewart and her broker were convicted in March 2004 of obstruction, perjury, and lying to investigators in relation to Stewart’s fortuitous sale of ImClone stock on the eve of an unfavorable FDA announcement.²⁰ And in May 2004 investment banker, Frank Quattrone was convicted of obstruction for urging subordinates to “clean up those files” after learning that his firm was under grand jury investigation for its method of allocating shares in initial public offerings.²¹ Regulators and prosecutors point to these and other cases as evidence that their toughened attitude is more than just talk.²²

¹⁸ CORPORATE FRAUD TASK FORCE FIRST YEAR REPORT, *supra* note 13, at 2.8. *See also* Harvey L. Pitt, Speech by SEC Chairman: Remarks before the U.S. Department of Justice Corporate Fraud Conference (Sept. 26, 2002), *available at* <http://www.sec.gov/news/speech/spch585.htm>. (“Prosecutions for lying to the SEC, destroying documents under SEC subpoena, or otherwise seeking to illegally frustrate our investigations also yield huge programmatic benefits. They have a significant deterrent effect.”); Statement of Deputy Attorney General, Larry Thompson, *available at* http://www.findarticles.com/p/articles/mi_pjus/is_200206/ai_1676538092 (“We will continue to vigorously pursue the obstruction of justice—a crime that undermines our justice system—where individuals or business organizations illegally interfere with the responsibilities of government investigators.”).

¹⁹ *Arthur Andersen, LLP v. United States*, 125 S. Ct. 2129, 2131-2135 (2005) (detailing Andersen’s evidence destruction, its conviction under 18 USC § 1512(b) for knowingly corruptly persuading others to alter and destroy documents, and its loss on appeal; reversing and remanding).

²⁰ *United States v. Stewart*, 323 F. Supp. 2d 606 (S.D.N.Y. 2004) (describing Martha Stewart’s conviction under 18 U.S.C. § 1001 for lying to investigators and § 1505 for obstructing an agency proceeding, her broker’s conviction under these two statutes and also under 18 U.S.C. § 1621 (perjury) for lying under oath to an SEC investigator, and the conviction of both Stewart and her broker for conspiring to do the same).

²¹ Andrew Ross Sorkin, *Wall St. Banker Is Found Guilty of Obstruction: Retrial Victory for U.S.; Star of Technology Boom in ‘90s Suggested Staff “Clean Up Files,”* N.Y. TIMES, May 4, 2004, at A1. *But see* Andrew Ross Sorkin, *Andersen Ruling Could Aid Appeal of Former Banker*, N.Y. TIMES, May 4, 2004, at C6 (discussing Quattrone’s prospects for appeal in light of the Supreme Court’s Andersen ruling).

²² CORPORATE FRAUD TASK FORCE FIRST YEAR REPORT, *supra* note 13 at 2.8 (citing example of Quattrone conviction); Pitt, *supra* note 18; Christopher A. Wray, Assistant Attorney General, Criminal Division, Remarks To The Association of Certified Fraud Examiners, Mid-South Chapter, Memphis, Tennessee (Sept. 2, 2004), *available at* http://www.usdoj.gov/criminal/press_room/speeches/2004_2954_rmks2CFC_TN090204.pdf. (“[L]ying to government investigators, obstructing our investigations, should be understood as one of the surest paths to severe consequences. That message should be coming through loud and clear with the convictions of Martha Stewart and First Boston’s Frank Quattrone in New York, and, of course, the conviction of the Arthur Andersen firm in the Enron investigation.”).

Such apparent shifts in the law's posture toward process crimes—and detection avoidance generally—have far outpaced our understanding of how the law ought to address such activities. This is more than just a catch-up problem for basic research. Conscientious practical policy discussions in this area inevitably lead to a series of foundational questions—questions for which scholarship would be the natural reference, but which it is largely unprepared to answer. Which forms of detection avoidance should be criminalized? How severe should sentences be? How vigorously should potential detection avoidance activity be investigated and prosecuted? Which forms of detection avoidance should be punished merely with procedural devices, like adverse jury instructions or burden shifting, rather than criminal penalties? Should the imposition of detection avoidance sanctions—whether criminal or procedural—require evidence of an underlying offense? How should investigators adjust the conduct of their investigation of the underlying offense upon encountering evidence of obstructive behavior? How, in general, should the law respond to the elemental problem of detection avoidance?

This article has two objectives. The first is to help lay a foundation upon which questions such as these can be answered. The second is to begin to provide some answers. As a starting point, the article trains its sights on but one of law's purposes, albeit one generally regarded to be among the most important: deterring violations through threat of penalty.²³ The article explores how this enterprise is affected by, and ought to be adjusted to account for, the effort that individuals exert to neutralize that threat.

²³ See Steven D. Levitt & Thomas J. Miles, *Empirical Study of Criminal Punishment* in HANDBOOK OF LAW & ECONOMICS (A. Mitchell Polinsky & Steven Shavell, eds.), *forthcoming* July 2005 (reviewing the empirical evidence and finding that “deterrence has a substantial but far from complete role in explaining observed patterns of criminal activity.”); Gary T. Schwartz, *Reality in the Economic Analysis of Tort Law: Does Tort Law Really Deter?*, 42 UCLA L. REV. 377, 422-23 (1994) (finding sustainable the view that current tort law does significantly deter in light of institutional detail and empirical studies, but discounting the possibility of fine tuning). *But see* Paul Robinson & John M. Darley, *Does Criminal Law Deter? A Behavioural Science Investigation*, 24 OXFORD J. LEGAL STUD. 173, 173, 197-204 (2004) (reviewing empirical evidence, finding no general material *ex ante* effect from “the formulation of criminal law rules or even sentencing policies or practices,” but allowing such effects from “having a criminal justice system that administers punishment” and “changes in police practices or allocation of resources”). Deterrence is tempered by other important values, issues, and instruments—including retributive justice, social norms, social meaning, professional responsibility, political economy, and constraints on state power. *See infra* note 49. In the specific context of detection avoidance, such additional considerations are discussed in, e.g., Stuart P. Green, *Uncovering the Cover-up Crimes*, 42 AM. CRIM. L. REV. 9, 28 (2005) (seeking to explain common moral perceptions regarding evidentiary foul play) and Daniel C. Richman & William J. Stuntz, *Al Capone's Revenge: an Essay on the Political Economy of Pretextual Prosecution*, 105 COLUM. L. REV. 583 (2005) (criticizing “pretextual prosecution”—including for perjury and obstruction—for its tendency to muddy the informational content of convictions and thereby limit the public's ability to monitor prosecutors.)

The analysis in the article is centered around a fundamental, though largely unexplored²⁴ formula of law enforcement—call it the “detection avoidance principle.” Sanctioning a given species of violation not only discourages that violation, it also encourages those who still commit the violation to expend additional resources avoiding detection. The greater the penalty, that is, the more imperative the cover up.²⁵ Raising the sentence on securities fraud, for instance, has the dual effect of deterring the fraud and spurring its concealment.

From a societal perspective detection avoidance is deadweight loss.²⁶ Resources expended structuring, following, and monitoring a document “retention” policy, for example, are resources diverted from innovation, production, and distribution. The best empirical evidence, reviewed in Part III, suggests that the social cost of detection avoidance is substantial—certainly relative to the social cost of detection, which plays such a decisive role in current enforcement theory. The extent to which an enforcement regime inspires additional private expenditure on detection avoidance is in fact as important a determinant of its cost effectiveness as the extent to which it requires additional public expenditure on detection.

What then can be done to lessen this wasteful byproduct of sanctioning underlying violations? One possibility is to sanction detection avoidance as well. Such is apparently the first impulse of many law makers²⁷ and legal scholars.²⁸ And the logic is admittedly

²⁴ Part II describes in detail the vanishingly small role that this principle has so far played in the development of enforcement theory. Preliminary explorations of this principle include (in chronological order) Arun S. Malik, *Avoidance, Screening, and Optimum Enforcement*, 21 RAND J. ECON. 341 (1990) (qualifying a result due to Professor Becker, described *infra* in Part II.A, that deterrence is most efficiently generated with large fines and small detection probabilities); Robert Innes, *Violator Avoidance Activities and Self-Reporting in Optimal Law Enforcement*, 17 J. L. ECON. & ORG. 239 (2001) (analyzing detection avoidance in the context of discounted sanctions for self-reporting); Albert Choi & Chris William Sanchirico, *Should Plaintiffs Win What Defendants Lose? Litigation Stakes, Litigation Effort, and the Benefits of Decoupling*, 33 J. LEGAL STUD. 323 (2004) (exploring the implications of defendants’ litigation effort for optimal “decoupling” of defendants’ liability and plaintiffs’ recovery).

²⁵ The article focuses on the detection avoidance activities of those who are guilty of underlying violations. Sanctions may also induce the innocent to exert additional evidentiary effort avoiding wrongful prosecution and liability. Many of the same principles apply to such exertions, though on a smaller scale. Those who refrain from wrongdoing have in effect chosen that forbearance as their chief means of avoiding detection, whereas those who commit the wrongdoing have only the evidentiary variety of detection avoidance to shield them from punishment.

²⁶ Part IV (supplemented by the mathematical appendix) more fully describes the impact of detection avoidance on the social welfare calculus.

²⁷ See *supra* text surrounding notes 2-22.

²⁸ See, e.g., Robert Cooter & Winand Emmons, *Truth-Bonding and Other Truth-Revealing Mechanisms for Courts*, 17 EUR. J. L. & ECON. 307 (2004) (proposing that witnesses post bonds forfeited on later discovery of false testimony); Robert Cooter & Winand Emmons, *Truth-Revealing Mechanisms for Courts*, 159 J. INST’L & THEOR’L ECON. 259 (2003) (similar); JAMIE S. GORELICK, STEPHEN MARZEN & LAWRENCE SOLUM, DESTRUCTION OF EVIDENCE § 3.1, at 66 (1989) (“discovery sanctions provide the most comprehensive and flexible remedies for

compelling. Sanctioning robbery discourages robbery. Why should perjury be any different?

But what this logic fails to take into account is that the detection avoidance principle applies as well to detection avoidance—that the principle is, in fact, fully recursive.²⁹

Just as hiking up sanctions on securities fraud encourages violators to exert more effort avoiding detection of their securities fraud, so hiking up sanctions on detection avoidance encourages detection avoiders to exert more effort avoiding detection of their detection avoidance. Sanctioning cover up, that is, makes covering up the cover up more imperative.

Can't we then also sanction cover up of cover up? Perhaps we can. But if it is fair to assume that cover up once removed is something that the government can discern, sanction, and thereby discourage, then it is also fair to assume that violators can discern cover up once removed as an activity that can itself be covered up. And it is therefore fair to conclude that the added sanction will inspire cover up twice removed just as it inhibits cover up once removed.

There is, of course, no logical end to this rhetorical see-you-and-raise-you. Every additional assertion that the next order of cover up, newly encouraged by the last order of sanctioning, can itself be sanctioned is defeated by the retort that, in that case, the next order of cover up will itself be more strenuously covered up in response.

evidence destruction in civil litigation”); Lisa C. Harris, *Note, Perjury Defeats Justice*, 42 WAYNE L. REV. 1755 (1996) (advocating a tougher stance toward perjury); Richard D. Friedman, *Dealing with Evidentiary Deficiency*, 18 CARDOZO L. REV. 1961 (1997) (describing when “public remedies” might be preferable to procedural and evidentiary sanctions or independent tort claims); Dale A. Nance, *Evidential Completeness and the Burden of Proof* 49 HASTINGS L.J. 621 (1998) (advocating judge-centered responses to unreasonable evidentiary incompleteness); Charles R. Nesson, *Incentives to Spoliate Evidence in Civil Litigation: The Need for Vigorous Judicial Action*, 13 CARDOZO L. REV. 793 (1991) (arguing for more vigorous enforcement of existing laws and rules against spoliation); Dale A. Oesterle, *A Private Litigant's Remedies for an Opponent's Inappropriate Destruction of Relevant Documents*, 61 TEX. L. REV. 1185 (1983) (advocating tightening laws against evidentiary foul play); Ariel Porat & Alex Stein, *Liability for Uncertainty: Making Evidential Damage Actionable*, 18 CARDOZO L. REV. 1891 (1997) (advocating recognition of a spoliation tort); Chris William Sanchirico, *Evidence Tampering*, 53 DUKE L. J. 1215, 1326 (2004) [hereinafter, Sanchirico, *Evidence Tampering*] (analyzing the primary activity deterrence effect of sanctions on “evidence tampering” broadly defined).

²⁹ Roughly speaking, a recursive formula is one whose output can be plugged back in as an input. Human reproduction is an example: humans in, humans out. For a helpful discussion of recursion and its role in linguistics, mathematics, and computer science see “Recursion,” in WIKIPEDIA, (July 13, 2005) <http://en.wikipedia.org/wiki/Recursion>. Recursion crops up in other legal applications, including the theory of corruption and the theory of social norms. See, e.g., Kaushik Basu, Sudipto Battacharya, & Ajit Mishra, *Notes on Bribery and the Control of Corruption*, 48 J. PUB. ECON. 349 (1992) (examining the infinite regress of bribery enforcement, as bribery apprehenders are bribed and, in turn, bribe their own apprehenders); Paul Mahoney & Chris William Sanchirico, *Norms, Repeated Games, and the Role for Law*, 91 CAL. L. REV. 1281 (2003) (describing the cooperation-supporting social norm “def-for-dev,” a recursive and “subgame perfect” alternative to “tit-for-tat”).

True to its recursive nature, the detection avoidance principle, if prodded, unfolds in infinite regress.

Sanctioning all links in the chain simultaneously is no solution. As explained in Part VI, sanctioning detection avoidance without regard to whether it is once, twice, or ten times removed—one (very hypothetical) interpretation of perjury³⁰ and obstruction³¹ statutes—actually serves to encourage detection avoidance all told. Discouraging detection avoidance requires, *in theory*, that higher “orders” of detection avoidance are sanctioned more than lower. Intuitively, for any given order of detection avoidance, the higher order sanction invited by the avoidance activity is its punishment, and the lower order sanction avoided, its reward. If the punishment is to exceed the reward, therefore, the higher order sanction must exceed the lower. Thus, the cover up should indeed be “worse” than the crime.³² But what is more, the cover up of the cover up should be worse than the cover up, and the cover up of the cover up of the cover up should be worse than the cover up of the cover up, etc...

What theory requires of sanctioning, therefore, practical policy could never supply. Separating—in order to separately treat—different orders of detection avoidance is hardly feasible. How, after all, is the fact finder to tell cover up of cover up of cover up from plain old cover up of cover up—especially when the detection avoider has an interest in making higher orders seem like lower?

Indeed, what the law in fact does with sanctions—some indication of what *is* practicable—is the opposite. The Federal Sentencing

³⁰ *E.g.*, 18 U.S.C. §§ 1621, 1623.

³¹ *E.g.*, 18 U.S.C. §§ 1503, 1512, 1515, 1519, 1520. There are several other sources of direct sanction. These include: (1) Contempt (*E.g.*, 18 U.S.C. §§ 401) which may, for example, result from a party’s failure to obey a court order, such as a motion to compel discovery. *E.g.*, FED. R. CIV. P. 37(b)(2)(D), (a); (2) Monetary sanctions under procedural rules in the form of payments by the party to the court or to the opponent, sometimes in the form of reimbursement for attorneys’ fees. *E.g.*, FED. R. CIV. P. 37(b)(2) (authorizing the court to “make such order in regard to the failure as are just” including explicitly the payment of attorneys’ fees and presumably additional payments as well); (3) Sanctions imposed by exercise of the court’s “inherent power.” *See, e.g.*, *Cappellupo v. FMC Corp.*, 126 F.R.D. 545, 553 (D. Minn. 1989) (document destruction sanctioned by requiring payment of twice the other side’s expenditures resulting therefrom).

³² *See, e.g.*, Frank Rick, *We’re not in Watergate Anymore*, N.Y. TIMES, July 10, 2005, at A12 (“the most basic lesson of Watergate: the cover-up is worse than the crime”); David Johnston, *Cover-up: Watergate’s Toughest Lesson*, N.Y. TIMES, Feb. 15, 1998, at A5 (“Watergate bequeathed many things to history, including this famous cliché: The cover-up is worse than the crime. Politicians haven’t necessarily absorbed this lesson, but the legal system has.”); William Safire, *One Blow for Truth*, N.Y. TIMES, Oct. 9, 1986, at A35 (“As usual in matters of state, the cover-up is worse than the crime.”); Henry Weinstein, *Martha Stewart Convicted: A Cover Again Proves Worse Than the Initial Act*, L.A. TIMES, Mar., 6, 2004, at C1 (“[Martha Stewart’s conviction] is another example of a person being trapped by their effort to conceal information that could show criminal conduct, rather than the conduct itself.” (quoting Professor Stephen Gillers))

Guidelines suggests a lower sanction for higher orders of avoidance,³³ thus rewarding avoidance more than it is penalized. To the same effect are rules and practices that punish detection avoidance by in effect increasing the chance of sanction *for the underlying wrong*—procedural devices like burden shifting,³⁴ adverse jury instructions,³⁵ or a policy of responding to obstructive behavior by intensifying investigation of the underlying violation.³⁶ To wit, an increase in the *chance* of suffering the underlying sanction is less of a punishment than the underlying sanction itself.

Thus, the detection avoidance principle—and specifically its recursivity—causes serious problems for attempts to limit detection avoidance by threat of sanction. What then should be done to control this source of social waste? This article advocates a direct “technological” approach. Rather than attempting to impose a legally constructed, detection-dependent cost on detection avoidance, the law ought to focus first on structuring evidentiary process so as to make resources spent on detection avoidance less productive for the detection avoider. To be sure, such technological attacks are often included in general law enforcement strategy: consider bank vaults, car locks, and house alarms. The point here is that the technological attack ought to be specially emphasized in the case of detection avoidance because of the unique inefficacy of sanctioning such activities.

One fruitful line of technological attack involves exploiting and exacerbating general difficulties inherent in all human endeavor. Part VIII explains how the productivity of detection avoidance expenditure can be reduced by designing evidentiary process (inclusive of investigative techniques) to emphasize the psychological limits of cognition and the sociological limits of cooperation. The productivity of the preparatory effort necessary to construct a consistent and detailed fabrication, for example, is reduced by refusing private cognitive aids to the interrogated or deposed while protecting their private use by interrogators and deposers.

³³ See *infra* note 115 and surrounding text.

³⁴ See, e.g., *Coleman Holdings v. Morgan Stanley*, 2005 WL 674885 (Fla. Cir. Ct. Mar. 23, 2005) (shifting the burden of proof onto the defendant as a sanction for its stonewalling in discovery).

³⁵ See, e.g., *Lewy v. Remington Arms Co.*, 836 F.2d 1104 (8th Cir. 1988) (reviewing an instruction suggesting to the jury that documents in the possession of a party but not turned over by that party upon request could be inferred to be damaging to that party’s case). Other examples of piggyback sanctions appear in FED. R. CIV. P. 37(b)(2)(A)-(C), (E) (providing that the court may take certain facts as given, refuse to hear certain claims or defenses, refuse to admit certain evidence, strike certain pleadings, stay or dismiss part or all of the action, or render judgment by default.)

³⁶ See, e.g., Charles M. Carberry & Harold K. Gordon, *Criminal Enforcement of Non-Fraud Provisions of the Federal Securities Laws*, 4 BUS. CRIMES BULL. COMPLIANCE & LITIG. 1 (1997) (“Securities crimes that include evidence of obstruction are ...more likely to be prosecuted.”)

Respectively, the destruction of documents becomes a less fruitful activity when employees and conspirators are induced to secretly retain their own copies on the chance that these will be useful bargaining chips in cutting separate deals with prosecutors.

In fact, such prescriptions are drawn largely from steps that the law already takes. And a deeper investigation of evidentiary misconduct—one that delves below the glittering surface of news headlines—indicates that these quieter devices continue to hum along as the law’s core response to detection avoidance, its principal adaptation to this central organic challenge.³⁷ This is how it should be, and how it should remain. To the extent that recent events indicate a need to intensify the law’s assault on detection avoidance, expanding and strengthening the technological impediments to its success should be the strategy of first resort.

The remainder of the article is organized as follows. Part II describes the conventional theory of public enforcement and its lopsided emphasis on detection to the exclusion of detection avoidance. Part III argues that detection avoidance activities are important in practice, despite their neglect in accepted theory. Part IV proposes an expanded framework incorporating the impact of avoidance activities on the cost effectiveness of law enforcement. Parts V-VII explore the relative inefficacy of sanctions in controlling detection avoidance. Parts VIII-X describe and argue for the alternative technological approach, identifying its quiet prevalence in the law. Concluding remarks appear in Part XI and an appendix houses mathematical formulations of the article’s main assertions.

II. Detection avoidance and neoclassical enforcement theory

Though at the hub of practical policy considerations, detection avoidance lies, on the scholarly map, somewhere in the no man’s land between evidentiary procedure and public enforcement theory—a position that may help explain why there is systematic neglect where there should be systematic analysis. In attempting to remedy the situation, one could take several approaches, expanding from either disciplinary border, or from both at once. The approach taken in this article is to start on the side of public enforcement theory, broadening it toward evidentiary procedure.³⁸ Accordingly, this Part

³⁷ See *infra* note 136 and surrounding text.

³⁸ On the limited role played by detection avoidance in the literature on evidentiary procedure see Chris William Sanchirico, *Evidence, Procedure, and the Upside of Cognitive Error*, 57 STAN. L. REV. 291, 294 n.10, 298, 301-306, 302 n.40 (2004) [hereinafter Sanchirico, *Upside of Cognitive Error*] (describing and critiquing scholarship’s relative inattention to the Holmesian

begins by identifying the core components of the predominant approach to public enforcement with particular attention to its inattention to detection avoidance. Part IV lays out a broader framework, to be applied throughout the article.

A. Elements of the neoclassical approach

The “neoclassical” approach to public enforcement builds on the “classical” model of crime laid out by Beccaria, Bentham and others in the late 18th century.³⁹ Those ancient roots were revived, formalized, and extended by Nobel laureate economist Gary Becker in 1968.⁴⁰ In the nearly three and a half decades since then, the neoclassical approach to public enforcement has constituted one of the most extensively farmed fields in law and economics.⁴¹ Such sustained attention has produced diverse incarnations and a wide array of implications,⁴² a multiformity not always recognized by critics.

Fair to say, however, two components of the neoclassical approach remain constant and essential. First is its account of the basic “machinery” of deterrence. The deterrent force exerted by law is viewed as the conjunction of two factors: the probability that violations are “detected” (i.e., investigated, uncovered, and successfully prosecuted) and the magnitude of the sanction imposed on the event of detection.⁴³ Thus, the potential wrongdoer, in deciding whether to misreport her firm’s earnings, cheat on her taxes, or hold up her local Seven Eleven, weighs in one pan of the balance her perception of the private gain from the activity and, in the other,

“bad actor” of evidentiary process) and Sanchirico, *Evidence Tampering*, *supra* note **Error! Bookmark not defined.**, at 1218 (“Evidence tampering [broadly defined] has been something of a Medusa in evidence scholarship.”). *See supra* note **Error! Bookmark not defined.** for some exceptions to this regularity.

³⁹ CESARE BECCARIA, OF CRIMES AND PUNISHMENTS (Kenelm Foster & Jane Grigson trans., 1964) (1764) and JEREMY BENTHAM, AN INTRODUCTION TO THE PRINCIPLES OF MORALS AND LEGISLATION (J. H. Burns & H. L. A. Hart eds., 1970) (1789).

⁴⁰ Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169 (1968).

⁴¹ A number of excellent surveys catalogue developments since Becker: Nuno Garoupa, *The Theory of Optimal Law Enforcement*, 11 J. ECON. SURVEYS 267 (1997) (surveying modern public enforcement theory); A. Mitchell Polinsky & Steven Shavell, *Public Enforcement of Law, Including Criminal Law*, in HANDBOOK OF LAW AND ECONOMICS (A. Mitchell Polinsky & Steven Shavell, eds.) [hereinafter Polinsky & Shavell, *Handbook Chapter*] (similar). *See also* Luigi Alberto Franzoni, *Tax Evasion and Tax Compliance*, ENCYCLOPAEDIA OF LAW AND ECONOMICS (B. Boukaert & G. de Geest, eds.) (2005) (surveying application of Becker’s model to tax enforcement).

⁴² *See, e.g.*, Garoupa, *supra* note 41; Polinsky & Shavell, *Handbook Chapter*, *supra* note 41.

⁴³ Becker, *supra* note 40, at 181-185. If one accounts for the possibility of false positives, the detection probability is replaced by the *difference* between the probability of (correct) detection given illegal behavior and the probability of (incorrect) detection given *legal* behavior—in other words, the degree to which illegal behavior increases the chance of punishment. A. Mitchell Polinsky & Steven Shavell, *Legal Error, Litigating and the Incentive to Obey the Law*, 5 J. L. ECON & ORG. 99 (1989).

her perception of both the chance that she will be caught and what will happen to her if she is.

This basic machinery of deterrence can be configured in many ways. The size of the sanction, the nature of the sanction, and the frequency of detection, for example, are all subject to policy choice. The second essential component of the neoclassical approach is its description of the cost benefit analysis that ought to be conducted in making these policy choices. The social benefits of deterrence are taken to be the benefits of reduced violations, including the benefits to those who would otherwise be victimized. The costs are typically parsed into two accounts, corresponding to the two factors in the neoclassical approach to deterrence mechanics, as just described. First are “detection costs,” the publicly incurred cost of investigating and prosecuting violations, as manifest in budgeting for regulatory enforcement divisions, police departments, and court systems. Second are “sanctioning costs,” the cost of imposing sanctions when violations lead to conviction or liability, including, for example, the operating costs and opportunity costs of keeping convicts in prison.⁴⁴

As an example of the kinds of conclusions that may follow from combining these two components, consider Becker’s famous prescription for efficient enforcement.⁴⁵ A monetary fine, he explains, is merely a transfer of resources from the offender to the government (which may in turn transfer the resources back to citizens in the form of spending increases or tax reductions). The social pie being no smaller for this redistribution of slices, raising the fine is a virtually costless means of generating additional deterrence. Other forms of sanction, such as imprisonment, consume social resources, positively reducing the size of the pie. Likewise, increasing the chance that violations are detected diverts labor and capital toward investigation and prosecution and away from productive activities. Best then to lower detection effort, only rarely catching offenders, and compensate by imposing large fines upon those few who are caught.⁴⁶

⁴⁴ The cost of precautions taken by private citizens—alarm systems, private security guards—constitutes a third category of cost. See, e.g., Becker, *supra* note 40, at 172, 200-201; Omri Ben-Shahar & Alon Harel, *Blaming the Victim: Optimal Incentives for Private Precautions Against Crime*, 11 J.L. ECON. & ORG. 434 (1995); C. Clotfelter, *Private Security and the Public Safety*, 5 J. URBAN ECON. 388 (1978); Steven Shavell, *Individual Precautions to Prevent Theft: Private versus Socially Optimal Behavior*, 11 INT’L REV. L. & ECON. 123 (1991); Ian Ayres & Steven D. Levitt *Measuring Positive Externalities from Unobservable Victim Precautions: An Empirical Analysis of Lojack*, 113 Q. J. ECON. 43 (1998).

⁴⁵ Becker, *supra* note 40, at 180-183.

⁴⁶ A more general prescription—that sanctions, even if costly, should be increased and the detection probability lowered—applies as well if the cost elasticity of sanctions is no greater than one, a special case of which is where the cost is a fixed multiple of the sanction. A

Qualifying Becker's prescription has been one of the chief tasks of neoclassical enforcement theory in Becker's wake.⁴⁷ As a result, the prescription survives as more of an important theoretical baseline than a practical policy recommendation. Nevertheless, the general framework within which Becker made his finding—the basic detect-and-sanction mechanic that he deployed and the particular social cost accounts that he chose to tally—continues to predominate.⁴⁸

B. Where's the mouse?

One can raise important foundational questions about the core components of the neoclassic approach—and many have.⁴⁹ It would seem difficult to argue, however, that the approach does not successfully accomplish what it sets out to do, insofar as that goes—that it is not, in other words, a sufficiently thorough and systematic treatment of both deterrence mechanics and the attendant social cost accounting.

special case of *this* is where the cost is zero. *Id.* at 180, 183 (1968) (assuming proportional costs).

⁴⁷ A nonexclusive list includes Lucian Arye Bebchuk & Louis Kaplow, *Optimal Sanctions and Differences in Individuals' Likelihood of Avoiding Detection* 13 INT'L REV. L. & ECON. 217 (1993) (finding that lowering the fine and perhaps raising the detection probability facilitates imposition of effectively separate expected sanctions according to individuals' heterogeneous ability to avoid detection, thus preventing over or under deterrence); Lucian Arye Bebchuk & Louis Kaplow, *Optimal Sanctions When Individuals Are Imperfectly Informed About the Probability of Apprehension*, 21 J. LEGAL STUD. 365 (1992) (finding that increasing the sanction multiplies the effect of individuals' errors in judging the probability of detection and thus exacerbates under and over deterrence.); Daniel Kahan, *Social Influence, Social Meaning, and Deterrence*, 83 VA. L. REV. 349, 351-352 (1997) ("Under the standard view...it may sometimes seem efficient to rely more heavily on a severe penalty than on a high probability of conviction...But if individuals infer widespread criminality from a low probability of apprehension, the power of social influence could more than offset any efficiency gains from this tradeoff."); Louis Kaplow, *The Optimal Probability and Magnitude of Fines for Acts That Definitely Are Undesirable*, 12 INT'L REV. L. & ECON. 3 (1992) (extending Polinsky & Shavell *infra* to show how the presence of offender risk bearing costs may raise the optimal level of deterrence); A Mitchell Polinsky & Steven Shavell, *The Optimal Tradeoff between the Probability and Magnitude of Fines*, 69 AMER. ECON. REV. 880 (1979) (incorporating the additional risk bearing costs borne by risk averse offenders when sanctions are increased); George J. Stigler, *The Optimal Enforcement of Laws*, 728 J. POL. ECON. 526 (focusing on cross offense incentives, and maintaining that if all fines are set to the same maximum level, offenders will choose serious rather than minor offenses, at least if detection probabilities cannot be appropriately adjusted across offenses).

⁴⁸ Garoupa, *supra* note 41; Polinsky & Shavell, *Handbook Chapter*, *supra* note 41.

⁴⁹ *See, e.g.*, Kahan, *supra* note 47, at 351-352 (critiquing the classic paradigm's neglect of law's role in influencing social norms as well as its interaction with individuals' own expression of character and values); MICHAEL S. MOORE, *PLACING BLAME: A GENERAL THEORY OF CRIMINAL LAW* (1978) (seminally advancing a retributive approach to criminal law); Robinson & Darley, *supra* note 23, at 174, 175-197 (2004) (critiquing the cognitive premises of the classic deterrence paradigm, including potential offenders' knowledge of the law, their correct perception of costs and benefits, and their ability to rationally decide); Chris William Sanchirico, *Deconstructing the New Efficiency Rationale*, 86 CORNELL L. REV. 1003 (2001) (critiquing the premise that legal rules should be set solely on the basis of aggregate social costs and benefits without regard to how those are distributed).

But that is what is argued here. For almost without exception neoclassical enforcement theory depicts the detection of violations as a one-sided affair. The state as *detector* decides how much to invest in apprehension and the more it invests the more likely it is to successfully detect violations. The *detected* has no active role in the story.

Yet listen a moment to the informed impressions of litigators and judges,⁵⁰ skim a few administrative policy pronouncements,⁵¹ go so

⁵⁰ Mark Curriden, *The Lies Have It*, 81 A.B.A. J. 68, 69 (1995) (quoting Federal District Judge Marvin H. Shoob: “people would be shocked if it were truly known how many witnesses lied under oath in a court of law every day.”); *id.* at 70 (quoting Milwaukee prosecutor E. Michael McCann, former chair of the ABA Section of Criminal Justice: “if perjury were water, the people in civil court would be drowning.”); *id.* (quoting a prominent trial judge as saying that perjury “is so widespread and pervasive that it has become a major concern among trial judges”); *id.* (quoting a state trial judge as saying: “I think there is an element out there beginning to realize that you can walk into court, take the oath, lie up a storm, and not have to worry about being punished for it, even if you are caught.”); RICHARD A. POSNER, AN AFFAIR OF STATE: THE INVESTIGATION, IMPEACHMENT, AND TRIAL OF PRESIDENT CLINTON 147 (1999) (“[i]t is not unusual for one judge to say to another that he or she has just presided at a trial at which several of the witnesses were obviously lying.”); Richard H. Uviller, *Credence, Character, and the Rules of Evidence: Seeing Through the Liar’s Tale*, 42 DUKE L.J. 776, 813 (1993) (“All guilty defendants who choose to testify will lie on the stand about anything that might improve their chances and about which they imagine they can be persuasive.”). GORELICK, MARZEN & SOLUM, *supra* note **Error! Bookmark not defined.**, at ix (“Many litigators privately confided to us that, at some point in their careers, they suspected or were confronted with the fact that documents were deliberately destroyed...Public confirmation ...was not hard to find.”); *id.* at § 18.1, 381 (“[p]ersons under investigation for tax violations often... panic and take steps to ‘fix’ the case against them by [evidence tampering]”); MARGARET M. KOESEL ET AL., SPOILIATION OF EVIDENCE: SANCTIONS AND REMEDIES FOR DESTRUCTION OF EVIDENCE IN CIVIL LITIGATION xi (2000) (“Spoliation of evidence is an unfortunate reality of modern-day civil litigation.”); Beckstrom, *Destruction of Documents with Federal Antitrust Significance*, 61 NW. U. L. REV. 687, 715 (1966) (“[W]illful document destruction in antitrust settings has been revealed in a number of cases, and...it is reasonable to speculate that, as with an iceberg, this is only a sample of what is below the surface.”); Steven M. Cohen, *What Is True? Perspectives of a Former Prosecutor*, 23 CARDOZO L. REV. 817, 817-18 (2002) (arguing as a former Assistant U.S. Attorney that witness cooperators often lie to police); Edward J. Imwinkelried, *A New Antidote for an Opponent’s Pretrial Discovery Misconduct: Treating the Misconduct at Trial as an Admission by Conduct of the Weakness of the Opponent’s Case*, 1993 BYU L. REV. 793, 794 (1993) (“The general consensus is that misconduct is widespread during discovery.”); Nesson, *supra* note **Error! Bookmark not defined.**, at 793 (“Interviews and surveys of litigators suggest [that spoliation is] a prevalent practice.”); Steffen Nolte, *The Spoliation Tort: An Approach to Underlying Principles*, 26 ST. MARY’S L.J. 351, 353 (1995) (“Destruction or spoliation of evidence in civil litigation has undermined the integrity of the adversary system.”); Dale A. Oesterle, *A Private Litigant’s Remedies for an Opponent’s Inappropriate Destruction of Relevant Documents*, 61 TEX. L. REV. 1185, 1186 (1983) (“The naked truth is that many corporations purposefully operate programs to destroy evidence.”); Harris, *supra* note **Error! Bookmark not defined.**, at 1777 (“[P]erjury in the courtrooms continues to skyrocket seemingly out of control.”); Laura Mansnerus, *Lying Rampant in Civil Suits, but Prison for Lying Is Rare*, N.Y. TIMES, Feb. 22, 1998, at A22 (“[L]egal experts agree that in ordinary civil suits, lying is rampant....”); Laurie Kindel & Kai Richter, *Spoliation of Evidence: Will the New Millennium See a Further Expansion of Sanctions for the Improper Destruction of Evidence?*, 27 WM. MITCHELL L. REV. 687, 710-11 (2000) (providing advice on how to prevent seemingly inevitable tampering by the other side).

⁵¹ See discussion of the Corporate Fraud Task Force surrounding *supra* notes 13-18.

far as to examine what systematic data exists,⁵² or even just glance at the occasional newspaper headline,⁵³ and it becomes difficult to avoid the conclusion that violators are more than mere spectators. Just as the state invests in detecting their violations, they invest in avoiding that detection. They lie, they shred, they bribe. They refrain from taking notes. They go out of their way to communicate only orally, in person, in private. They wear gloves and masks. They work under cover of darkness. They open foreign bank accounts. They form offshore entities. They launder tainted money. They launder bloody socks.

The investigation and prosecution of crimes and regulatory violations is not, in fact, an exercise in orienteering. It is a chase, consisting of a pursuit *and* a flight.

Amidst the numerous contributions to neoclassical theory spanning several decades and several fields of legal studies, this fundamental fact manifests in but a few brief, isolated flashes. One of the only systematic accounts is provided in a fifteen year old paper by Professor Arun Malik, who recognizes that detection avoidance costs provide (yet another) qualification to Becker's prescription that fines should be large and detection probabilities small.⁵⁴ Raising the fine may not incur the expenditure of additional public resources on detection, as Becker pointed out. But, says Malik, it most definitely inspires the expenditure of additional *private* resources on detection *avoidance* especially among those who remain undeterred. To raise the

⁵² Samuel R. Gross et al., *Exonerations in the United States 1989 through 2003*, 95 J. CRIM L & CRIMINOLOGY 523, 551 (2005) (studying more than 350 criminal exonerations from 1989 to 2003, finding most from rape and murder convictions, and stating: "For murder, the leading cause of the false convictions we know about is perjury—including perjury by supposed participants or eyewitnesses to the crime who knew the innocent defendants in advance."). Survey data includes: Steven D. Pepe, Standards of Legal Negotiations: Interim Report and Preliminary Findings 3 (1983) (finding that 50% of surveyed litigators view "unfair or inadequate disclosure" as either a frequent or regular problem); Steven D. Pepe, Summary of Selected Findings of the Study on the Standards of Legal Negotiations 16 (date unknown) (same); Wayne D. Brazil, *Civil Discovery: Lawyers' Views of Its Effectiveness, Its Principal Problems and Abuses*, 1980 AM. B. FOUND. RES. J. 787, 790 (1980) (finding based on survey data that it is "difficult to exaggerate the pervasiveness of evasive practices or their adverse impact on the efficiency and effectiveness (for information distribution) of civil discovery. Evasion infects every kind of litigation and frustrates lawyers in every kind of practice."); *id.* (finding that surveyed litigators believed "lack of candor or bad faith by the opposing party or attorney," impeded discovery in 14 percent of their cases on average); Richard O. Arther & John E. Reid, *Utilizing Lie Detector Techniques to Determine the Truth in Disputed Paternity Cases*, 45 J. CRIM. L. CRIMINOLOGY & POLICE SCI. 213, 215 (1954) (finding that 90 percent of parties in a large sample of paternity suits admitted after trial that they lied under oath when subsequently confronted with a lie detector test); Alan R. Beckenstein & H. Landis Gabel, *Antitrust Compliance: Results of a Survey of Legal Opinion*, 51 ANTITRUST L.J. 459 (1982) (more than half of survey respondents say that they often or always encounter "policies that reduce historical records."). *But see*, Sanchirico, *Evidence Tampering*, *supra* note **Error! Bookmark not defined.** at 1231-1239 (critiquing these studies and their use in legal scholarship).

⁵³ *See, e.g., supra* notes 19-21 and surrounding text (discussing the Andersen, Stewart, and Quattrone cases).

⁵⁴ Malik, *supra* note 24, at 341-348 (formally proving this caveat in Proposition 1(iii)).

fine is to increase the pain of detection and, therefore, to increase the relief from avoiding it. Were the fine \$100,000, reducing the chance of detection by one percentage point would be worth (roughly) \$1000.⁵⁵ Doubling the fine to \$200,000 (roughly) doubles that value to \$2000.

In fact, Malik does little to develop the point beyond providing this additional caveat to Becker.⁵⁶ He does not consider policies that attempt to deter detection avoidance itself—the subject of this article.⁵⁷ He does not recognize the recursivity of the detection avoidance principle (the focus of Parts V-VII). And he does not examine the potential for shaping detection activities to reduce the productivity of detection avoidance (the focus of Part VIII).⁵⁸ Of course, none of this was incumbent upon Malik himself, who probably deserves more credit for raising an important and neglected issue. The real problem is that the otherwise well developed body of literature that follows in the decade and a half since Malik has also declined to develop his initial insight, effectively relegating it to an occasionally footnoted nubbin. For the most part, neoclassic enforcement theory has continued to ignore detection avoidance, even as it strenuously refines and extends its one-sided approach.⁵⁹

⁵⁵ Throughout the rest of the article it will be assumed in all numerical examples that the violator is risk neutral. We will also speak of percentage point changes as if there were greater precision than there actually is. Both practices are purely for ease of exposition.

⁵⁶ *But see infra* note 95 describing ancillary results in Malik's article.

⁵⁷ This may explain the rather limited set of examples of detection avoidance that Malik provides—the use of radar detectors and lobbying for lax enforcement of environmental regulations—neither of which are *per se* sanctionable.

⁵⁸ Malik explicitly assumes that state policy has no effect on the productivity of detection avoidance. Malik, *supra* note 24, at 343 (assuming relevant cross derivative to be zero in equation (5) and surrounding text).

⁵⁹ *See, e.g.*, Polinsky & Shavell, *Handbook Chapter, supra* note 41 (surveying enforcement theory and citing Malik's article in passing without discussion of its content); A. Mitchell Polinsky & Steven Shavell, *The Economic Theory of Public Enforcement of Law*, 38 J. ECON. LIT. 45 (2000) (same). *But see*, Garoupa, *supra* note 41 (surveying of public enforcement theory and presenting Malik's caveat as a formal proposition). Lexis and Westlaw searches indicate that Malik's article has been cited in only about a half a dozen law review articles, and always only in passing. Half of these citing articles are by the same author. Among the very few articles outside the law review literature that account for detection avoidance activities are Innes, *supra* note 24 (arguing that a self-reporting regime can lower detection avoidance costs without compromising deterrence, if sanctions on self-reported violations are set equal to the violator's all-in effective sanction, including detection avoidance costs) and Choi & Sanchirico, *supra* note 24 (arguing that defendant's litigation effort (akin to detection avoidance costs) reverses the usual optimality of "decoupling" of defendants' liability and plaintiffs' recovery in high stakes cases with deep pocket defendants).

Somewhat related to the problem of detection avoidance is the general literature on self-reporting of violations, including in part: Louis Kaplow & Steven Shavell, *Optimal Law Enforcement with Self-Reporting of Behavior*, 102 J. POL. ECON. 583 (1994) (arguing that self-reporting can lower both enforcement costs and risk-bearing costs); Jennifer Arlen, *The Potentially Perverse Effects of Corporate Criminal Liability*, 23 J. LEGAL STUD. 833 (1994) (analyzing the problem of vicarious corporate criminal liability and the incentive to monitor employees, and advocating conditioning fines on monitoring effort); Jennifer Arlen & Renier Kraakman, *Controlling Corporate Misconduct: An Analysis of Corporate Liability Regimes*, 72 NYU L REV 687

III. The empirical importance of detection avoidance costs

In attempting to defend the conventional one-sided approach to enforcement, one might argue that the social costs of detection avoidance are negligible in practice and therefore justifiably ignored. This Part counters that assertion.

The counterargument proceeds simultaneously in two modes. The first addresses the significance of these costs head on, arguing that they are indeed substantial in an absolute sense, aside from comparison with other relevant costs.

The second mode of argument is a form of estoppel. The conventional enforcement paradigm relies heavily on the significance of the public cost of detection. Safe to say, were *that* cost taken as negligible, most of the findings in the literature would be upturned. (Becker's prescription of high fines and low detection probabilities is not unique in this regard). But the social cost of detection *avoidance* parallels that of detection. Just as the public consumes social resources detecting violations, the offender consumes social resources avoiding detection. The state uncovers, the offender covers up.

Indeed, the state's pursuit of violations is costly largely because of, and to the extent that, the offender incurs costs in the flight. Detecting violations requires the expenditure of public resources commensurate with the offender's counterbalancing expenditure avoiding detection. If culprits turned themselves in, if taxpayers noted on their returns how they had understated their income, detection would be virtually cost-free. The cat would burn few calories, that is, but for the calories burned by the mouse.

The remainder of this Part supports these claims with a more detailed analysis of the nature and extent of detection avoidance costs. Although systematic empirical evidence on the relative cost of

(1997) (extending Arlen's model to the problem of inducing firms to monitor employee activities that may have harmful environmental consequences, and also considering duty-based regimes and self-reporting); Chris William Sanchirico & Alexander S. P. Pfaff, *Environmental Self-Auditing: Setting the Proper Incentives for Discovering and Correcting Environmental Harm*, 16 J. L. ECON. & ORG. 189 (2000) (analyzing the problem of optimally inducing firms to investigate their own potential violations given the positive impact of such investigation on the chance such violations will be detected); Robert Innes, *Self-Policing and Optimal Law Enforcement When Violator Remediation Is Valuable*, 7 J. POL. ECON. 1305 (1999) (emphasizing the problem that firms have insufficient incentive to remediate violations unless and until those violations are detected by the regulator, and proposing making fines contingent on the firm's pre-detection remediation costs).

detection avoidance is hard to come by,⁶⁰ the best evidence available strongly suggests that we are dealing here with a formidable rodent.

A. The Andersen briefs

Lawyers often bat around the term “zealous advocacy” with little indication of where precisely they would locate the foul line between legal and illegal (not to mention the line between ethical and unethical). And in general lawyers and their clients have little reason to be specific.

Yet the Arthur Andersen case,⁶¹ as it rose to the U.S. Supreme Court from the courts below, staked out a border that apparently left many lawyers standing in foul territory. As a result, the case flushed out some surprisingly candid claims regarding the ubiquity of various detection avoidance activities. Reading these briefs, one is tempted to conclude that avoiding detection is the daily task of the entire defense bar.

According to the amicus brief of the National Association of Criminal Defense Lawyers (NACDL),⁶² the 5th circuit’s reading of the obstruction statute⁶³ made it criminal to impede a government investigation. The NACDL reacted to this as if they were the National Association of Bakers and the 5th circuit had interpreted the law to prohibit mixing flour and water. “Impede government investigations?” was the plea. “That’s what we do.” The 5th circuit’s ruling, said the NACDL, “disregards the traditional role of lawyers, which includes a duty to protect their clients by deflecting potential government investigations.”⁶⁴ Similarly, according to the amicus brief

⁶⁰ See Sanchirico, *Evidence Tampering*, *supra* note **Error! Bookmark not defined.**, at 1230-1239 (reviewing empirical evidence on the prevalence of evidentiary foul play).

⁶¹ Arthur Andersen LLP v. United States, 125 S. Ct. 2129 (2005).

⁶² Brief of Amicus Curiae National Association of Criminal Defense Lawyers in Support of Petitioner, Arthur Andersen, LLP v. United States, 125 S. Ct. 2129 (2005) (No. 04-368), available as 2005 WL 435903.

⁶³ Arthur Andersen, LLP v. United States, 374 F.3d 281 (5th Cir. 2004), *reversed and remanded by* 125 S. Ct. 2129 (2005).

⁶⁴ Brief of Amicus Curiae National Association of Criminal Defense Lawyers in Support of Petitioner at 2, Arthur Andersen, LLP v. United States, 125 S. Ct. 2129 (2005) (No. 04-368), available as 2005 WL 435903. See also, *id.* at 1-2 (“When a lawyer represents a client in connection with a potential government investigation, one of the lawyer’s goals may appropriately be to prevent the government from developing evidence against the client. Within the bounds of ethics and the law, that is what lawyers do.”); *id.* at 8 (“[I]nvariably in the practice of law a zealous advocate will devise and execute legitimate strategies intended, at least in part, to deflect an investigation. In essence, that is a lawyer’s job.”); *id.* at 21-22 (“[T]he lower court’s reading of the statute intrudes deeply into the day-to-day practice of law...Lawyers review draft documents for their clients all the time. They routinely recommend revising or deleting inflammatory, pejorative, or potentially incriminating language, often, at least in part, to limit exposure in the event of a possible future government investigation.”). See also Henry J. Friendly, *Some Kind of Hearing*, 123 U. PA. L. REV. 1267, 1288 (1975) cited in NACDL brief (“Within the limits of professional propriety, causing delay and sowing confusion not only are [an attorney’s] right but may be his duty.”);

of the New York Council of Defense Lawyers (NYCDL), “an attorney may need to give her client advice that, if followed, would result in testimony, a document, or a record being withheld from an official proceeding or that would result in the testimony of a witness being influenced. That is an attorney’s job.”⁶⁵ Whether the U.S. Supreme Court would go quite so far is uncertain from its opinion in the Andersen case, wherein the only examples of legitimately impeding government investigations concern the assertion of privileges and the question-begging “compl[iance] with a *valid* document retention policy under *ordinary* circumstances”⁶⁶ [emphasis added]. But it seems clear at least from these briefs that litigators themselves go at least so far in daily practice.

The NACDL boasts 12,200 members.⁶⁷ The SEC has approximately 4000 full time positions with 1000 full time staff in its enforcement division.⁶⁸ In laying down the full social cost of enforcement—on however abstract a basis—what could justify counting what 4000 government lawyers do to investigate, but not what 12,200 defense lawyers do to impede that investigation?⁶⁹

B. The Cost of “Retaining” Documents

One thing a lawyer might do to avoid detection is help clients destroy the evidentiary emissions of violations. Much of this activity is likely to be *sub rosa* and its full magnitude difficult to gauge. But some destructive activity is not sanctionable (or at least not clearly so), and its relative openness provides another opportunity to glimpse at least a portion of the costs of detection avoidance.

If a firm destroys documents with an eye toward impeding a particular government investigation, it exposes itself to prosecution for obstruction of justice, as well as a host of potential evidentiary and procedural sanctions.⁷⁰ If, however, a firm destroys documents

KENNETH MANN, DEFENDING WHITE COLLAR CRIME 5 (1985) *cited in* NACDL brief (“[T]his is the central theme of the white-collar crime defense function, the defense attorney works to keep potential evidence out of government reach by controlling access to information.”); JULIE R. O’SULLIVAN, FEDERAL WHITE COLLAR CRIME 12 (2001) *cited in* NACDL brief (“[T]he challenges facing defense counsel are ... limiting, consistent with ethical and legal constraints, government access to incriminating evidence...”).

⁶⁵ Brief of Amicus Curiae New York Council of Defense Lawyers in Support of Petitioner at 6, *Arthur Andersen, LLP v. United States*, 125 S. Ct. 2129 (2005) (No. 04-368), *available as* 2005 WL 435901. *See also id.* at 2 (“Lawyers representing corporations or individuals often give advice or take action designed to protect their client yet impede the fact-finding ability of a government investigation.”)

⁶⁶ *Arthur Andersen*, 125 S. Ct. at 2129, n. 8 and surrounding text.

⁶⁷ <http://www.nacdl.org/public.nsf/freeform/WhoWeAre?OpenDocument> (last visited March 28, 2005).

⁶⁸ SECURITIES AND EXCHANGE COMMISSION, ANNUAL REPORT, 15, 142 (2003).

⁶⁹ The comparison is, of course, imprecise; yet telling.

⁷⁰ *Cappellupo v. FMC Corp.*, 126 F.R.D. 545, 553 (D. Minn. 1989) (document destruction sanctioned by requiring payment of twice the other side’s expenditures resulting therefrom);

with no particular investigation in its sights, that destruction will typically not trigger sanction, even if the destroyed documents turn out to be the missing link in a future enforcement action.⁷¹

Precisely how out of focus the future investigation must be in order to shield the firm from punishment is unsettled. But it appears that one way to produce the requisite disconnectedness is to institute an ongoing program of document destruction, with the semblance of routine house cleaning, one whose detection avoidance goals are diluted by the correlated and not *entirely* implausible desire to manage the expense of document storage.⁷²

Although systematic empirical evidence tends to be scarce, and where available, somewhat stale, such “document retention policies” appear to be prevalent.⁷³ Important for our purposes, they also appear to be expensive. Ironically, given the state of the literature on public enforcement, the chief expense is not in drafting the policy, but in enforcing it.

Presumably, few firms promote on the basis of how well an employee complies with its document policy; few bonuses reflect a job well done in this regard. More likely, routine instructions to comply with the firm’s document retention policy sit long untended on employees too long list of low priority things to do. Had it been otherwise at Credit Suisse First Boston, after all, Frank Quattrone

Carlucci v. Piper Aircraft Corp., 102 F.R.D. 472 (S.D. Fla. 1984), *aff'd*, 775 F.2d 1440 (11th Cir. 1985) (similar)

⁷¹ Arthur Andersen LLP v. United States, 125 S. Ct. 2129, n. 8 and surrounding text (2005); Lewy v. Remington Arms Co., 836 F.2d 1104 (8th Cir. 1988) (reviewing a spoliation instruction issued in response to document destruction).

⁷² *Lewy*, 836 F.2d at 1112.

⁷³ GORELICK, MARZEN & SOLUM *supra* note **Error! Bookmark not defined.**, § 8.2, at 276 (“The vast majority of large business enterprises now has some formal document-management program.” (citing John M. Fedders & Lauryn H. Guttenplan, *Document Retention and Destruction: Practical, Legal and Ethical Considerations*, 56 NOTRE DAME L. REV. 5 (1980))); Oesterle, *supra* note **Error! Bookmark not defined.**, at 1185-86 (“[M]any corporations purposefully operate programs to destroy evidence... primarily to reduce litigation ‘exposure.’”); Lawrence B. Solum & Stephen J. Marzen, *Truth and Uncertainty: Legal Control of the Destruction of Evidence*, 36 EMORY L.J. 1085, 1183 (“The routine destruction of documents, often accomplished through formal ‘document management’ programs, has become commonplace.” (citing AM. SOC’Y OF CORP. SEC’YS, INC., SURVEY OF RECORDS RETENTION PRACTICES 2 (1971))). Document retention programs are often the subject of articles in the practice literature. See generally GORELICK, MARZEN & SOLUM *supra* note **Error! Bookmark not defined.**, app. A (providing sample policies); *id.* app. B (same); KOESEL ET AL., *supra* note 50, at 16-26 (discussing the importance of documentation retention policies and providing advice on how to implement them); Fedders & Guttenplan, *supra* (providing general advice on document retention policies); Donald S. Skupsky, *Discovery and Destruction of E-Mail*, in THE INTERNET AND BUSINESS: A LAWYER’S GUIDE TO THE EMERGING LEGAL ISSUES 47-59 (Joseph F. Ruh, Jr. ed., 1996) (discussing how e-mail messages are stored and can be used against the author, making recommendations about how to handle e-mail).

would have had no need to forward the email (“time to clean up those files”) that led to his conviction for obstruction.⁷⁴

Indeed, to the extent that employees would, without prodding, give document retention policies a first thought, this is likely to be immediately accompanied by second thoughts. Leaving document clean up a permanent item on the to do list might not seem like such a bad idea, given a modicum of foresight about the fact that, in future states of the world where such documents become important, the employee’s interests may not always line up with those of the firm. Thus, while a midlevel manager may urge her subordinates to shred documents, she may decide to keep a choice collection in her own personal files, anticipating the possibility of later trading these for leniency with prosecutors and regulators.

How do firms manage this costly *private* enforcement problem? Some firms place certain of their employees in charge of enforcing their retention policies. Salary then goes to an employee who is not engaged in the underlying productive activity of the firm. Should cost cutting become imperative, such employees are more likely to be let go or reassigned. Thus, “early [in 2000], to cut costs, Andersen dismissed some employees who handled...shredding, and paper began stacking up. By June [2001], accountants handling Enron in Houston were virtually buried in documents that, under [Andersen’s document retention] policy, should have been shredded long before.”⁷⁵

Other firms make document destruction a periodic event, like the company picnic. Chip manufacturer Rambus Inc. allegedly held an annual “shredding day,” whereon employees were provided with burlap sacks and on at least one occasion pizza, beer, and champagne.⁷⁶ The question arises, what weren’t employees doing while they were busy shredding, chewing, and sipping?

Still other firms hire third party auditors. A thriving business has grown up around the problem of enforcing document retention policies. The advertising tag: “it’s one thing to have a policy; it’s another to implement and audit it.”⁷⁷ The “news release” issued by one company, Forensicon, is particularly enlightening:

⁷⁴ See *supra* note 21.

⁷⁵ Kurt Eichenwald, *Andersen Misread Depths of the Government’s Anger*, N.Y. TIMES, Mar. 18, 2002, at A1.

⁷⁶ Bloomberg News, *Lawyer: Rambus Shredded Evidence*, L.A. TIMES, Feb. 7, 2005, at C2 (describing allegations of lawyer for Rambus’ litigation opponent)

⁷⁷ Forensicon, *Document Retention Policies: Lessons from Andersen: e-Mail Reveals!* available at http://www.forensicon.com/pdfs/article_documentretention.pdf (last visited March 30, 2005)

Preventive maintenance, including the education and training of employees on the policy, is essential to ensure the policy is enforced. “We work with management and counsel to test the effectiveness of the policy by conducting periodic searches of the data environment to see whether or not anything of interest turns up. If something is found, counsel and the client discuss the ramifications and develop a strategy for dealing with that data or problematic behavior before anything gets to the point of litigation, so that the firm is protected and doesn’t incriminate itself by keeping needlessly files that it has a right to dispose of...If you have a policy, you need to audit it” Neubecker [Forsenicon’s President] explains. “If you say these are things you do and don’t do in email, how do you know employees are following the policy?...You need to periodically pull in a third party firm to audit your adherence to your communications policies. Recent events and trends suggest that as firms get slapped with lawsuits, business leaders will appreciate the value of managing this risk. Insurance rates are going to go up, and eventually companies will be required to enforce and audit their document retention policies with third party risk management firms in conjunction with attorneys.”⁷⁸

Thus, effective document destruction costs quite a bit more than the electricity used to power the shredder, its chief costs inuring to enforcement. How odd then that while the conventional enforcement paradigm carefully counts the costs of having the SEC acquire and sift through private firms’ documents, it does not count the firm’s cost of shifting through and destroying documents as part of its private cost of detection avoidance.

C. Correction v. Cover-up at the Eleventh Hour

Sometimes document retention policies are insufficiency comprehensive, or are allowed to lapse, in which case some last minute evidence destruction may be attempted. Such last minute destruction also entails social costs, though of a different kind from the cost of “retention” policies.

Emergency destruction comes at a time of crisis where each moment counts. Instead of trying to prevent a bad outcome, the individual diverts attention to avoiding blame. When her ability to prevent a crisis is possible but uncertain, the individual has a difficult choice to make: buckle down, or cover up.

Arthur Andersen chose to cover up. According to the Government’s brief in Opposition before the Supreme Court:

[Andersen’s] Enron auditors were instructed to make compliance with the document policy a priority ***despite the mounting time pressure they faced in dealing with Enron’s accounting problems.*** As a result, the Enron engagement team made an unprecedented effort to destroy non-workpaper documents. Documents were shredded on-site

⁷⁸ *Id.*

and also were shipped to petitioner's main office for bulk shredding. A chart showing the quantity of materials shipped for shredding during 2001 reveals the extraordinary spike in physical document destruction that coincided with petitioner's discovery of the SEC inquiry....In addition to the destruction of hard copies of documents, tens of thousands of e-mails and other electronic documents were deleted, representing at least a three-fold increase over usual activity.⁷⁹ [emphasis added]

D. Evidence Non-creation

Another way to avoid detection is to avoid creating the evidence in the first place. "Don't put it in writing' is advice lawyers give every day—to protect clients from creating documents that may be used, or often misused, to their detriment."⁸⁰ Lawyers reportedly encourage clients to follow the "New York Times rule:" "Before writing something down, consider how it would look on the front page of the New York Times."⁸¹ Union Pacific, facing litigation arising from accidents at train crossings, instructs its claims investigators that "no useful purpose is served by extensively documenting evidence."⁸² The litigation consulting firm LitigationProofing LLC lists among the "seven deadly sins of business email:" "Not considering how it would look in the newspaper....guaranteeing, leaking sensitive information, [and] carrying on a debate."⁸³

Evidence non creation is also costly. People create records for a reason. The unaided human mind is in many respects not particularly impressive, and certainly not up to the task of running an enterprise (legitimate or otherwise) in the modern world. Fortunately, after several centuries of failure and reflection, the mind has been at least impressive enough to develop clever methods of compensating for its shortcomings. These methods often involve the keeping of records to aid the working and long term memory.⁸⁴

Records are also often the byproduct of devices, like email, that facilitate communication. Email and paper correspondence remove the inconvenient necessity of physical proximity from the activity of communication. And having a record of what was said facilitates

⁷⁹ Brief for the United States in Opposition Petitioner at 7, *Arthur Andersen LLP v. United States*, 125 S. Ct. 2129 (2005) (No. 04-368), available as 2004 WL 2825876.

⁸⁰ Stephen Gillers, *The Flaw in the Andersen Verdict*, N.Y. TIMES, June 18, 2002, at A23.

⁸¹ See, e.g., Jack V. Auspitz & Susan E. Quinn, *Litigators' View of Due Diligence*, 1368 PLI/Corp 107, 173 (2003) cited in *NACDL Andersen brief*; Ellis R. Mirsky, *Managing the Litigation Process*, 407 PLI/Lit 9, 30 (1991) cited in *NACDL Andersen brief*.

⁸² Walt Bogdanich, *In Deaths at Rail Crossings, Missing Evidence and Silence*, N.Y. TIMES, July 11, 2004, at A1.

⁸³ Porus P. Cooper, *Lawyers sifting clients' e-mail can alter case results*, PHIL. INQ., June 2, 2005 at C1(?).

⁸⁴ See generally, Sanchirico, *Upside of Cognitive Error*, *supra* note **Error! Bookmark not defined.**, at 355-363 (describing use of cognitive artifacts)

coordination by preventing misunderstandings (either actual or the *ex post* pretense thereof).

Such records, however, are the stuff of evidence. The proverbial “paper trail” is often a trail of mental crutches.⁸⁵ Martha Stewart and her broker, for instance, were convicted largely on the basis of phone logs and worksheets.⁸⁶

As a result, individuals face a dilemma, one that affects even legitimate activities. Not knowing or caring to focus constant attention on whether any given set of notes will end up as, or lead to damaging evidence, the individual too broadly refrains from recordation. Consequently, she and her team function at a lower level than they otherwise would. She cannot remember the details of the meeting. And the documents she prepared must be revised again to reflect what she forgot. Not having written down her promise to perform a task—lest arrival of a better opportunity made breach worthwhile—she forgets to complete a part of the project that she agreed to orally and now must return her equipment to the job site after the customer complains.

E. Lying

Records—in their systematic ongoing destruction, their destruction in crisis mode at the eleventh hour, or their non-creation in the first place—may well be the locus for significant detection avoidance costs. But what about lying? Perhaps good old fashioned deception is at last an example of a common act of detection avoidance that is much less costly to perpetrate than to penetrate. After all, lying is easy. First you fill your lungs. Then you say something false. In contrast, to detect that someone else is lying requires extensive research and intensive preparation.

⁸⁵ *Id.*

⁸⁶ Superseding Indictment, at 7, United States v. Stewart, 323 F. Supp. 2d 606 (S.D.N.Y. 2004) (S1 03 Cr. 717 (MGC)), available at <http://news.findlaw.com/hdocs/docs/mstewart/usmspb10504sind.pdf> (“On December 27, 2001, at approximately 10:04 a.m. (EST), within minutes after being informed of the sale and attempted sale of the Waksal Shares, PETER BACANOVIC called MARTHA STEWART. After being told that STEWART was in transit and unavailable, BACANOVIC left a message, memorialized by STEWART’s assistant, that ‘Peter Bacanovic thinks ImClone is going to start trading downward.’”). In addition, the ImClone CEO’s phone log for later that same day reads, “Martha Stewart something is going on with ImClone and she wants to know what” Samuel Waksal’s December 27, 2001 Message Log, <http://news.findlaw.com/hdocs/docs/mstewart/swms122701msglog.html>; Superseding Indictment, United States v. Stewart, at 16 (“[One week before the phone message, Bacanovic] printed a ‘worksheet’ that listed each of the stocks held by Martha Stewart at Merrill Lynch, including ImClone Bacanovic made handwritten notes in blue ballpoint ink on the Worksheet concerning transactions and planned transactions in Stewart’s account Bacanovic made no notes on the Worksheet regarding any purported decision to sell Stewart’s ImClone shares at \$60 per share.”); see also *infra* note 304 (discussing the allegation that Bacanovic later penned in “@60”).

But this contrast is misleading. The act with which to compare lie detection is not lying *per se*. It is lying undetected. And lying undetected requires at least as much effort as successfully detecting a lie. All the loose ends that the lie detector might pull to unravel the lie must be anticipated and sewn up ahead of time by the liar. If the lie detector will ferret out witnesses with contradictory accounts, the liar must visit them first. If the lie detector will comb the liar's account for internal inconsistencies, the liar must do the same with her anticipated account. If the lie detector will investigate whether the liar's account is consistent with the state of the world at the time of purported events—with train schedules, sight lines, distances—then the liar must pre-investigate the same in crafting her lie.⁸⁷ Safe to say, therefore, that for every hour of effort logged by the lie detector, at least one hour is logged by the successful liar.

IV. A broader theoretical framework

Recognizing that enforcement is a two-sided affair has a profound impact on both of the core components of the neoclassical approach to public enforcement.⁸⁸ And it is helpful to lay these effects out systematically before proceeding to a more specific comparison of policy alternatives. This Part describes first the effect on deterrence mechanics and then the effect on social cost accounting. It concludes with a discussion of how enforcement policies ought to be compared within the broader framework thus constructed. (The article's appendix contains a mathematical account of the analysis to follow.)

A. The effect of detection avoidance on deterrence mechanics

Under the conventional neoclassical approach, the degree to which underlying violations are deterred depends on the sanction and the detection probability. Detection avoidance complicates this machinery in several ways.

Firstly, and most obviously, detection avoidance activities reduce the probability that underlying violations will be detected. To this extent, such activities reduce the law's deterrent force.

But, secondly, detection avoidance activities are costly for those who engage in them, and such costs must be counted as part of the effective sanction for the underlying violation. Time and effort spent

⁸⁷ See *generally*, Sanchirico, *Upside of Cognitive Error*, *supra* note 38, at 317-344 (describing the cognitive difficulty of successfully fabricating witness testimony).

⁸⁸ See *supra* Part II.A.

covering up improper corporate self-dealing, for example, is time and effort not spent entering new markets or developing new products—or playing golf for that matter. From the self-dealer’s perspective there is little difference between a dollar of sanction for self-dealing and a dollar spent avoiding that sanction. Both are costs of self-dealing. Thus, although detection avoidance activities reduce the probability that self-dealing will be detected, the resulting reduction in deterrence is mitigated by the self-dealer’s additional detection avoidance costs.⁸⁹

Thirdly, adding detection avoidance to the story raises the possibility that it itself can be sanctioned. Later parts of the article cast doubt on whether sanctioning detection avoidance deters detection avoidance itself. The question here is whether it helps to deter the *underlying violation*, and the answer is yes. Penalizing obstruction, for example, imposes upon the corporate self-dealer another cost—a legally constructed, probabilistic cost—of avoiding detection. As with the *direct* costs of detection avoidance activities, discussed above, this legally constructed cost counteracts the fact that detection avoidance reduces the detection probability for self-dealing. Again, the self dealer is being forced to pay for activities that reduce the probability that the underlying violation will be detected. Here the payment is in terms of the risk of obstruction penalties, rather than the direct costs of these activities.⁹⁰

⁸⁹ Given that these first two effects are countervailing, how do they compare in magnitude? Statements can be made for the case in which the violator is perfectly rational, and perhaps some of these can be extrapolated. Taken as a whole the net effect of the rational violator’s detection avoidance must be to lower her effective sanction. The dollar value of the reduction in the probability of detection (the first effect described in the text) must exceed what she is spending on that reduction (the second effect). Otherwise, she could do better by doing nothing to avoid detection. Marginal changes from her chosen amount of detection avoidance expenditure, however, will have no impact on the effective sanction. The two effects described in the text will precisely balance. A violator who minimizes the effective sanction will choose her level of detection avoidance at a point where the marginal cost of detection avoidance equals its marginal benefit—where each additional dollar of detection avoidance buys a dollar’s worth of reduction in the probability of detection. Were this not so, the violator could marginally adjust her detection avoidance expenditure (up or down) and affirmatively lower the effective sanction, contradicting that she has already minimized that quantity. The fact that detection avoidance has no marginal impact on the effective sanction has implications for evaluating the deterrence effects of marginal policy changes. One might imagine that such changes have both a direct and indirect effect on deterrence: that, for example, the increase in the effective sanction caused by increasing the legal sanction is dampened by the additional detection avoidance that is inspired. Not so. The two effects on deterrence of the inspired detection avoidance precisely cancel, zeroing out the indirect effect and leaving only the direct. This is an informal statement of the so-called “envelope theorem.”

⁹⁰ But note that the deterrent effect on the underlying activity from sanctioning detection avoidance is naturally bounded. In particular, deterrence of the underlying activity cannot exceed the sanction for the underlying activity, no matter how great the sanction on detection avoidance. The violator could always do nothing to avoid detection and end up paying at most the underlying sanction for her violation.

Finally, accounting for detection avoidance turns detection itself into a more complex policy variable, and, accordingly, the range of alternative detection policies expands. Informed by neoclassical enforcement theory, we are accustomed to thinking of detection as a fixed probability presented to violators by the state. But with detection avoidance in the picture violators themselves can affect the probability of detection, at cost. And thus the state effectively presents to the violator not a single probability of detection, but a “menu” of detection probabilities, one for each of her possible choices of detection avoidance intensity. By adjusting this menu, the state can affect both the detection avoidance choices of violators and the decision to violate the law in the first place--just as a restaurant, in adjusting its food menu can affect both what its patrons order as well as how many patrons it attracts. Adjusting this menu is the basic mechanism of the technological approach, which we explore in detail in Part VIII.⁹¹

B. The effect of detection avoidance on social cost accounting

As discussed, the neoclassical approach focuses on the publicly incurred cost of “detecting” underlying violations as well as the direct social cost of sanctions like imprisonment. To these two costs, three new costs must be added.

The first necessary addition to social costs is the private cost of detection avoidance: expenses incurred by private parties in hampering investigation and fighting prosecution.⁹² The state’s *detection* activities are costly because they divert labor and capital from other productive activities. Detection avoidance is costly for precisely the same reason.⁹³ The fact that detection avoidance expenses are privately rather than publicly financed make them no less a social cost. Consider that the social cost of violations and

⁹¹ As under the conventional approach to enforcement, this discussion generally abstracts from the possibility that liability may be wrongfully imposed. But the effects identified in the article can be regarded as the net effect on the expected sanction given commission of the violation and the expected sanction given restraint. Consider, for example, the first effect discussed. Detection avoidance lowers the probability of detection for *both* the guilty and the innocent. But, arguably, it lowers it more for the guilty who have more to cover up. On net, therefore, it detracts from deterrence.

⁹² Some activities, like harming or bribing witnesses, do double duty as detection avoidance relative to other violations and violations in and of themselves. The analysis applies as well to these activities with the added feature that some of the direct cost of detection avoidance are externalities relative to the avoider’s detection avoidance decision.

⁹³ One might claim that the social cost of detection avoidance is a substantial problem only to the extent that deterrence of underlying violations is incomplete. This does not distinguish it from the bulk of enforcement costs, including, e.g., the direct cost of sanctions. Of course, neither does this conditional negligibility render detection avoidance costs any less of a practical problem, given the condition’s practical failure.

imprisonment—two costs most definitely counted in the neoclassical approach—are also largely privately incurred.

The other two costs arise to the extent that detection avoidance is itself subject to sanction. They are counterparts to the two costs—of detection and of sanctioning—that arise in the neoclassical paradigm. First, there is the public cost of detecting detection avoidance. Perjury, for example, must also be investigated and prosecuted.⁹⁴ Second, there is the direct cost of sanctioning detection avoidance. When, for example, Martha Stewart spend five months in prison for obstructing justice and lying to investigators, the costs to society included, *inter alia*, the apportioned cost of operating the prison and the opportunity cost of reducing (however slightly) Stewart's productivity.⁹⁵

C. Comparing policy instruments

In the context of this expanded framework we ask again the question posed by the neoclassical approach: what is the most cost effective means of deterring law violations? Answering this question requires evaluating the cost effectiveness of each of the several policy instruments at our disposal, including sanctions on underlying violations, sanctions on detection avoidance, and detection policies like the technological approach. In evaluating each instrument, we must consider two attributes. First, how much does the instrument contribute toward deterrence: that is how much does it raise the effective private cost to the potential offender of the underlying violation. Second, how much does it contribute to social costs,

⁹⁴ This cost is discussed in more detail in Part IX.C

⁹⁵ Malik considers the possibility that offenders' private benefits from underlying law violations might be wholly or partially observable by the court, explaining that this would enable the state to reduce detection avoidance costs. Malik, *supra* note 24, at 341-348. If the court could perfectly observe the violator's private benefits, for example, it could charge parties the social cost of their underlying violations, unless those costs were less than the parties' private gains. In this case, the only individuals committing the offense would be those whose private gains from the activity exceeded the social cost. These individuals would not be subject to punishment, and therefore would have no need for detection avoidance. Self-evidently, this story neglects the issue of detecting (and avoiding detection of) the fact that the social costs from a violation exceed the violator's private benefits.

Professor Innes proposes that detection avoidance costs can be reduced by offering violators who self-report their violations a discounted sanction equal to slightly less than the expected effective sanction they faced for unreported violations as affected by their anticipated detection avoidance. Violators would take this offer, thus having no need to avoid detection. At the same time deterrence would be essentially maintained. Innes, *supra* note 24. Disclosure is such a powerful remedy in Innes's model because, unlike other interactions between violator and regulator, it is assumed to be immune from manipulation. If disclosure of *some* violation halts or slows investigation, for example, violators might use disclosure of small violations to cover large, in which case disclosure itself would be a mode of detection avoidance. This is one explanation for why disclosed violations under EPA's self-reporting program have been disproportionately minor. Alexander Pfaff & Chris William Sanchirico, *Big Field, Small Potatoes: An Empirical Assessment of EPA's Self-Audit Policy* 23 J. POLICY ANAL. & MGMT. 415 (2004).

whether directly or through the behavior it induces. A relatively cost effective instrument incurs relatively low social costs per “unit” of generated deterrence. Reciprocally, such an instrument has a large deterrence “bang” for its social cost “buck.”⁹⁶

We have already discussed in Part II the cost effectiveness of the policy instrument which is sanctions on the primary activity. In particular, we have noted an important new consideration that arises from recognizing the existence of detection avoidance, namely the detection avoidance principle. What remains is to evaluate the cost effectiveness of the other policy instruments identified above, namely sanctions *on detection avoidance* and (the expanded range of) detection policies. The next several Parts explore the cost effectiveness of sanctioning detection avoidance. Part VIII turns to detection policies that attack the technology of avoidance.

V. The recursivity of detection avoidance

At first blush, sanctioning detection avoidance seems like a promising policy option. There will, of course, be the cost of investigating and prosecuting yet another species of violation. But perhaps such additional public detection costs will pay for themselves in reduced private detection avoidance. And, to boot, sanctioning detection avoidance will increase deterrence of the underlying violation by raising the effective cost of perpetrating such violations. Perhaps then sanctioning detection avoidance kills two birds with one stone by deterring both the underlying wrong and detection avoidance activity.

An implicit assumption underlying this optimistic suggestion is that detection avoidance is subject to the same detect-and-sanction mechanic as any other activity—that a sanction on detection avoidance discourages detection avoidance just as a sanction on robbery discourages robbery. Such is the implicit assumption of the few commentators who consider the effects of sanctioning perjury and obstruction.⁹⁷ And to read as written the statutes governing such process crimes, it also appears to be the implicit assumption

⁹⁶ An instrument’s efficiency in generating deterrence will generally vary with the extent to which it and other instruments are employed. Accordingly, the socially optimal enforcement regime may involve a mixture of instruments, as when instruments that are initially efficient becomes less so the more they are employed. Roughly speaking, however, instruments that tend to be more efficient across a broad range of employment levels will be more intensely employed at the optimum. Furthermore, the efficiency of each instrument in the neighborhood of current levels of employment (which may not be optimal) is relevant for determining how best to increase deterrence from its current level, should that be desired. It is also relevant to determining whether and how, in producing the current level of deterrence, resources could be conserved by substituting one instrument for another.

⁹⁷ See *supra* note **Error! Bookmark not defined.**

underlying the law. Perjury and obstruction of justice are crimes, just as robbery is a crime.⁹⁸ Uncharged obstructive behavior in the investigation or prosecution of another crime is grounds for sentencing enhancement.⁹⁹ And various forms of evidentiary foul play—short of perjury or obstruction, but long of zealous advocacy—are subject to procedural sanction, either by explicit procedural rule¹⁰⁰ or by courts’ exercise of their “inherent power” to govern process.¹⁰¹

But detection avoidance is not, in fact, like robbery. It is a species of violation with special properties, a social problem to which the usual detect-and-sanction mechanic does not apply. Cleave another violation with a sanction and you discourage it. Cleave detection avoidance, and like the Hydra, its back end grows another head.

A. The infinite regress of detection avoidance

The hip-hop artist, Lil’ Kim was recently convicted of lying to the grand jury investigating her associates’ involvement in a shooting outside the studios of radio station Hot 97. At her perjury trial she lied to the trial jury about having lied to the grand jury.¹⁰²

The investment bank, Morgan Stanley, was recently sued for aiding and abetting fraud in connection with the demise of the Sunbeam Corporation.¹⁰³ Ordered to produce relevant email correspondence,¹⁰⁴ it stonewalled.¹⁰⁵ Ordered to produce documents relevant to the accusation that it was stonewalling, it stonewalled.¹⁰⁶

This is what people do.¹⁰⁷ They do not simply lie. They lie about lying. And if you accuse them of that, they lie about lying about

⁹⁸ See, e.g., 18 U.S.C. 1001, 1621, 1623, 1503, 1505, 1512, 1519, 1520.

⁹⁹ See, e.g., U.S. SENTENCING GUIDELINES MANUAL § 3C1.1.

¹⁰⁰ See, e.g., FED. R. CIV. P. 11, 26(g), and 37.

¹⁰¹ See, e.g., Cappellupo v. FMC Corp., 126 F.R.D. 545 (D. Minn. 1989) (imposing monetary sanction for document destruction); Carlucci v. Piper Aircraft Corp., 102 F.R.D. 472 (S.D. Fla. 1984), *aff’d*, 775 F.2d 1440 (11th Cir. 1985) (similar); Lewy v. Remington Arms Co., 836 F.2d 1104 (8th Cir. 1988) (issuing spoliation instruction for destruction under document retention policy).

¹⁰² Julia Preston, *Admitting to Lies About Shooting, Lil’ Kim Gets One Year in Prison*, N. Y. TIMES, July 7, 2005, at B1.

¹⁰³ Coleman Holdings v. Morgan Stanley, 2005 WL 674885 (Fla. Cir. Ct. Mar. 23, 2005).

¹⁰⁴ Coleman Holdings v. Morgan Stanley, 2005 WL 674885, at ___ (Fla. Cir. Ct. Mar. 23, 2005) (describing “Agreed Order”)

¹⁰⁵ Coleman Holdings v. Morgan Stanley, 2005 WL 674885, at *5, *5 n. 11 (Fla. Cir. Ct. Mar. 23, 2005).

¹⁰⁶ Coleman Holdings v. Morgan Stanley, 2005 WL 674885, at *7 (Fla. Cir. Ct. Mar. 23, 2005). (“MS & Co. improperly failed to produce 125 documents required to be produced by the Court’s February 3, 2005, Order Specially Setting Hearing which required limited discovery be made in connection with the February 14, 2005, hearing on the Adverse Inference Motion.”)

¹⁰⁷ See also United States v. Roche, 321 F.3d 607 (6th Cir. 2003) (describing how, in an attempt to lighten his sentence for bank robbery, the defendant fabricated a letter from the

lying. They do not simply destroy evidence. They also destroy evidence of evidence destruction. And if you ask them about either destruction, they lie. They do not merely intimidate witnesses. They lie about the intimidation, and then destroy evidence of the lying, and then intimidate witnesses to the destruction. By real people, in real time cover up is covered up in a chain of effectively infinite length: a chain, that is, always one link longer than the pursuer is willing to follow it.

This potentially infinite regress wreaks havoc on the conventional detection-and-sanction machinery of neoclassical enforcement theory. We have already noted Malik's insight that imposing a fine on primary violations like robbery encourages individuals to expend effort avoiding detection of primary violations. We can generalize this to the "detection avoidance principle": sanctioning activity X encourages another activity $X+1$ in the form of effort exerted to avoid detection of X .

Stating the principle in these general terms makes clear that it is recursive. Because the formula applies to *any* activity X , we are free to substitute "detection avoidance" itself for X , whereby it begets an $X+1$ equal to effort exerted to avoid detection of *detection avoidance*. Indeed, nothing stops us from returning to the formula with "detection avoidance of detection avoidance," substituting this for X and generating, as $X+1$, effort exerted to avoid detection of *detection avoidance of detection avoidance*. And we may continue like this *ad infinitum* repeatedly inputting the last application's output.

Thus, when we punish people more for underlying offenses, we encourage offenders to lie. If we try to solve this problem by punishing more for lying we encourage liars to expend more effort covering up their lies. If we try to solve *this* problem by increasing the punishment for covering up lies, we encourage the cover up of the cover up of lying. Similarly, raising the punishment for the underlying offense encourages offenders to seek and destroy damaging evidence. If we attack this social waste by punishing the destruction of evidence, we encourage people who still destroy evidence to (inter alia) destroy evidence of their destruction. If we

mother of his children stating that he had consistently made child support payments. Indicted for the obstructive forgery, he attempted to convince the mother to falsely testify that she had consented to the letter. Accused of this attempt to suborn perjury, he then lied about the incident.); U.S. v. Lueddeke 908 F.2d 230 (7th 1990) (describing how the defendant lied to a grand jury about making illegal payments to college football players to induce them to sign representation agreements. Informed that he was being investigated for perjury, he forged documents to cover up the lie.); United States v. Agoro 966 F.2d 1288, 1290 (1st Cir 1993) (describing how the defendant fled the jurisdiction following his conviction for credit card fraud, and how, charged with failing to appear, he fabricated an excuse involving his wife's emergency return to Nigeria on developing a "paralyzing disease of unknown origin").

then take aim at destruction of evidence of evidence destruction, we encourage people to destroy evidence of their destruction of evidence of evidence destruction. In more general (but less confusing) terms, sanctioning the underlying offender encourages “first order” detection avoidance. Sanctioning first order detection avoidance encourages “second order” detection avoidance. Sanctioning second order encourages third. Sanctioning third encourages fourth. And so on.

Is it really plausible that violators engage in higher orders of cover up? What *is* cover up of cover up of cover up of cover up? The assertion here is not that cover up four times (or n times) removed is unconditionally plausible. The assertion is that it becomes plausible in the only circumstance that its plausibility matters. This is where it is assumed that the government can identify, sanction, and thereby discourage cover up *three* times removed. The effectiveness of that sanction presupposes that cover up thrice removed is a discernible activity in the minds of violators. And at that point, its progeny is irrelevant: it is just an activity and it will be covered up like any other that is also subject to sanction. All that matters is that cover-up four times removed is the child of a now sanctioned activity. That the now sanctioned activity also has a parent (who in turn has a parent, etc...) is of no consequence.

The point, therefore, is not that the detection avoidance principle unfolds in infinite regress all by itself. The point is that it *will* unfold if prodded: that it always remains one order ahead of the last effective sanction.

B. Clarifying remarks

Of course, the existence of an additional unanticipated difficulty is not by itself reason to give up on the enterprise of sanctioning detection avoidance. And the next Part of the article explores what might be done to surmount this newfound issue. But first a few clarifying remarks regarding the nature of the problem to be addressed.

First, sanctioning any given order of detection avoidance does, to be sure, reduce spending on *that* order, just as sanctioning robbery (“0th order detection avoidance”) reduces robbery. The point is that while that order of detection avoidance is discouraged, higher orders are encouraged. Summing across *all* orders of detection avoidance, $X = 1, 2, 3, \dots$ the net effect is as likely an increase as a decrease in the total social waste of detection avoidance activities across all orders. The effect on that total is what is of ultimate concern. In general whether aggregate detection avoidance increases or decreases will depend on the “sanctioning hierarchy:” in particular, whether

sanctions are constant, increasing, or decreasing across orders of avoidance, as discussed in the next Part.

Second, the claim here is not that sanctioning lower order detection avoidance necessarily produces higher order detection avoidance where there was none before. The offender's ability to avoid detection of her detection avoidance determines in part her success in avoiding detection. Success in avoiding detection by destroying documents, for example, is fostered by destroying documentary evidence of the destruction. The claim, rather, is that sanctioning detection avoidance additionally encourages higher order detection avoidance where there was no such additional encouragement.¹⁰⁸

Thirdly, despite first appearances, the recursivity of detection avoidance is not another example of the age-old policy pitfall of ignoring substitution effects. The policy "hall of shame" is full of such instances: as when trying to reduce the fishing harvest by limiting boat size, we just induce fishermen to use better equipment with little effect on harvest;¹⁰⁹ or trying to enhance teacher performance by rewarding for high student test scores, we quash the teaching of unobservable attributes like creativity;¹¹⁰ or trying to prevent car theft by equipping some cars with visible steering locks, we just induce thieves to rob the cars lacking such locks;¹¹¹ or trying to reduce cocaine use by increasing the penalty, we end up encouraging the use of heroin.¹¹² In all these cases, one activity is effectively "taxed" ("subsidized"), and the corresponding reduction (increase) in that activity makes an alternative activity more (less) productive. This seesaw relationship between one activity's level and the other's productivity is the essence of the substitution effect.

If anything, however, higher and lower orders of detection avoidance are "complements," not substitutes. More of either *increases* the productivity of the other. More cover up of the cover up, that is,

¹⁰⁸ This implies a more complex and complete version of the detection avoidance principle. Sanctioning detection avoidance of order *X* encourages *all* orders of detection avoidance greater than *X*, since all higher order facilitate avoiding detection of *X*. This is the version of the principle explored in the appendix.

¹⁰⁹ See, e.g., James N. Sanchirico, *Managing Marine Capture Fisheries with Incentive Based Price Instruments*, 3 PUB. FIN & MGMT 67, 67-69 (2003) ("[A] suite of regulations, including gear and vessel restrictions, minimum size limits, total allowable catch limits, closed areas and seasons...increase the costs of fishing, but in a manner that distorts the optimal allocation of resources.")

¹¹⁰ Bengt Holmström & Paul Milgrom, *Multitask principal agent analysis: incentive contracts, assets ownership and job design*, 7 J. LAW, ECON. & ORG. 24, 25 (1991).

¹¹¹ C. Clotfelter, *Private Security and the Public Safety*, 5 J. URBAN ECON. 388 (1978); Steven Shavell, *Individual Precautions to Prevent Theft: Private versus Socially Optimal Behavior*, 11 INT'L REV. L. & ECON. 123 (1991); Ian Ayres & Steven D. Levitt *Measuring Positive Externalities from Unobservable Victim Precautions: An Empirical Analysis of Lojack*, 113 Q. J. ECON. 43 (1998).

¹¹² Neal Kumar Katyal, *Deterrence's Difficulty*, 95 MICH. L. REV. 2385 (1997) [hereinafter Katyal, *Deterrence's Difficulty*].

makes the cover up itself *more* productive, not less. Conversely, more cover up makes covering up the cover up more productive. The detection avoidance principle does not describe a situation in which we “tax” lower order detection avoidance and thereby cause a substitution into higher. Taxing lower order detection avoidance—and nothing else—ought to reduce complementary higher order detection avoidance. What’s happening rather is that the “tax” on lower order detection avoidance is simultaneously a “subsidy” on higher. An additional dollar of sanction on first order avoidance, for example, is in effect an additional dollar of reward for second.¹¹³

VI. Sanctioning hierarchies

Deterring detection avoidance is, as argued in the preceding Part, not merely a matter of hammering it down with sanctions in the conventional manner. Rather the enterprise is a bit more like the carnival game with moles, holes, and mallets. Clobber first order avoidance with a sanction and this causes second order avoidance to pop its head out of some other hole. Knock second back down and third pops up somewhere else. Wallop third and up comes fourth.

A few minutes of this and one understandably develops the conviction that what is really needed is a mallet with an infinite number heads to hammer all holes at once. In this Part we consider just this: simultaneously sanctioning all “orders” of detection avoidance (as well as the underlying violation).

A. Uniform sanctions

We begin with policies that apply the same level of sanction to all orders of avoidance. For its relative simplicity, this most basic of sanctioning hierarchies is a good place to start analytically. It is also a good starting point doctrinally: criminal statutes applicable to certain egregious forms of detection avoidance read as if they do just this, at least for order one through infinity. All orders of perjury—including perjury about perjury about perjury about perjury—are potentially perjury and are thus sanctioned, at least in theory, to the same degree. The same holds for all orders of obstruction of justice.

Whether we truly do, or even could impose a universal sanction on all orders of detection avoidance is open to serious question, as discussed later in this Part. But it is important to recognize that even were a universal sanction practicable, it would have contradictory

¹¹³ Another important issue for analysis not considered in this article is substitution across modes (rather than orders) of detection avoidance. Sanctioning one mode of avoidance and not a second will generally cause substitution into the second. This may be partly beneficial if the first mode has substantial external costs or is otherwise less desirable socially.

effects, simultaneously discouraging *and* encouraging detection avoidance. Indeed, to the extent that offenders balance the marginal costs and benefits of detection avoidance in deciding how much to engage in the activity, the net effect of a universal sanction would be to positively encourage detection avoidance.

In the explanation that follows we focus on the effect on second order detection avoidance of increasing a universal detection avoidance sanction. The analysis applies to any order of detection avoidance (including first if the primary activity sanction is the same as the sanction for first order detection avoidance.)

1. Countervailing effects

Second order detection avoidance has, for the perpetrator, both a sanctions-increasing downside and a sanctions-reducing upside. The sanctions-increasing downside results from the increased possibility of incurring a sanction for second order detection avoidance activity itself. The more the offender engages in such activity, the greater the prevalence of evidentiary emissions therefrom, and, therefore, the greater her chance of getting caught. Of course, the magnitude of this downside depends also on the size of the sanction that is invited.

The sanctions-reducing upside of second order detection avoidance is borne from the decreased possibility of incurring the sanction for *first* order detection avoidance. It is correspondingly dependent on the size of the sanction that is avoided.

Increasing the universal sanction for detection avoidance increases both the sanction-increasing downside and the sanctions-reducing upside of second order detection avoidance. It makes second order detection avoidance both more dangerous and more imperative.

Consider, for instance, the following stylized example that we shall carry throughout the next several sections. Imagine that we increase the uniform fine from \$400,000 to \$1,000,000. We then also increase the benefit to the perpetrator of every percentage point decrease in the chance of having to pay this fine for her first order detection avoidance. For a risk neutral perpetrator, for example, that value was formerly 1% of \$400,000, or \$4,000. Now it is 1% of \$1,000,000, or \$10,000.

Conversely, we also increase the cost to the perpetrator of every percentage point *increase* in the chance of having to pay this fine for her second order detection avoidance itself: again from \$4,000 to \$10,000. Additional second order detection avoidance is, therefore, \$6,000 more beneficial to the offender *for every percentage point* that it reduces the probability of detection for first order detection

avoidance, and it is \$6,000 more costly for every percentage point that it increases the probability of detection of itself.

In general, raising the universal sanction will increase *the per percentage point* upside of additional detection avoidance as much as it decreases the per percentage point downside.

2. Sanctions' dominant effect on the upside

Whether increasing the universal sanction increases the upside of additional second order detection avoidance more than the downside depends, therefore, on whether additional second order avoidance decreases the chance of sanction for first order avoidance by more percentage points than it increases the chance of sanction for second.

Returning to the numerical example, suppose, for instance, that \$1000 of additional detection avoidance decreases the probability of sanction for first order detection avoidance by two percentage points while increasing the probability of sanction for second order detection avoidance by only one. We have already determined that increasing the universal sanction from \$400,000 to \$1,000,000 increases both the upside and downside of second order detection avoidance by \$6000 *per percentage point*. Therefore, the upside of detection avoidance increases by \$12,000 and the downside by only \$6,000. On net, therefore, the increase in the universal sanction encourages additional detection avoidance.

What's happening here is that the net probability change from additional second order detection avoidance spending tilts in favor of second order detection avoidance. Increasing the uniform sanction amplifies the benefits of this favorable net change in probabilities and so encourages additional detection avoidance.

Indeed, this is liable to be the general case. To see this, consider the violator's choice of second order detection avoidance prior to the increase in the uniform sanction. Focus, in particular, on the last \$1000 that she chose to spend on detection avoidance. This \$1000 must have purchased something beneficial for the violator, otherwise she would not have spent it. What it purchased was a reduction in the chance of having to pay the uniform sanction for second order detection avoidance that was affirmatively greater than the increase in the chance of having to pay that same sanction for first. The same is liable to be true for the *next* \$1000. In this case, additional spending on second order detection avoidance will indeed effect a net reduction in the chance of having to pay the uniform sanction, a net reduction that becomes more valuable when the sanction that is on net avoided is increased.

B. Increasing sanctions

If a uniform sanction fails to discourage detection avoidance, is there a non uniform sanction structure that does the job? On a purely theoretical level, the answer is yes. The sanction hierarchy needs to be such that higher orders of detection avoidance are punished more severely. Unfortunately this purely theoretical level barely intersects the practical plane.

When we raised the uniform sanction in the previous section, the *per probability point* changes in second order avoidance's upside and downside were equal. Thus, the fact that the upside reduction in probability points exceeded the downside increase ruled the day. The way to fix this is to make the per probability point change greater for the downside than for the upside. And the way to do *this* is to raise the second order sanction more than the first.

The simplest case is where we increase only the second order sanction. This has no (direct) effect on the sanctions-reducing upside of second order detection avoidance. On the other hand, it increases the sanctions-increasing downside. Therefore, it discourages second order detection avoidance and appears to solve the problem identified in the previous Part.

But this avenue of approach quickly runs into several debilitating problems. The first is practical. Imposing different sanctions across first and second order detection avoidance activities supposes that the state can reliably distinguish between them. This is likely to be difficult. Especially so, given that we have thus provided the second order perpetrator—caught for *some* detection avoidance—with an interest in portraying her avoidance activity as merely first order in an effort to reduce her sanction.

The second problem begins as theoretical and ends as a multiplication of the practical problem just described. When we further increase the sanction for second order detection avoidance we also further increase the sanctions-reducing benefit of *third* order detection avoidance. Again, the recursivity of the detection avoidance principle casts its shadow on an otherwise hopeful proposal.

In order to address this additional leakage, we would have to increase the sanction for third order detection avoidance even more than the sanction for second. If we kept the first order sanction at \$400,000 and raised the second order to \$1,000,000, for instance, we might have to raise the third order sanction to \$1,600,000. That, of course, will then encourage *fourth* order detection avoidance, and the sanction for it will have to be raised by an even greater amount, perhaps from

\$400,000 to \$2,000,000. In principle, this would proceed *ad infinitum*, producing an ever increasing schedule of sanctions.

The necessity of ever increasing fines compounds the practical problems discussed above. Telling second order detection avoidance from first is hard enough. Telling fifth order from, say, third is likely to be nearly impossible. Indeed, telling fifth order detection avoidance from activities that are not detection avoidance of *any* order seems itself a nearly insurmountable difficulty.

C. Decreasing sanctions

The fact that higher orders of detection avoidance are likely to get lost in the crowd of daily activity leads to the very real possibility that not only is an increasing sanction impracticable, but, in fact the best we can do is even worse than the uniform sanction considered in the first section of this Part. The best we can do, it would seem, is a sanctioning hierarchy that is, in effect, if not on paper, decreasing in the order of detection avoidance, with first order avoidance sanctioned most severely, second order less severely, third order even less severely, and so on.

To some extent, this is even reflected in current law. It is true, as noted above, that criminal statutes dealing with perjury and obstruction do not make a distinction between first and higher order instances of their respective crimes. In practice, however, higher order instances of detection avoidance are more likely to be punished not by separate charge and conviction, but by a sentencing enhancement for the first order obstruction.¹¹⁴ These sentencing enhancements do make a distinction, generally imposing a lower punishment on higher order avoidance. Thus, the advisory Federal Sentencing Guidelines provide for a sentencing enhancement for obstructive activity that is itself aimed at the investigation, prosecution, and sentencing of obstruction of justice. But the enhancement is two offense levels, while the base offense level for obstruction is fourteen.¹¹⁵ For the case in which the defendant has no criminal history and sentences fall at the midpoint of their respective guideline ranges, this means that second order obstruction

¹¹⁴ There appear to be no reported cases in which the defendant is charged with perjury or obstruction, and where the underlying proceeding was itself a prosecution for perjury or obstruction. There are, however, several reported cases in which a sentence for obstruction of justice was enhanced for further obstructive behavior. *See supra* note 107. *See also infra* note 115.

¹¹⁵ *Compare* U.S. SENTENCING GUIDELINES MANUAL § 2J1.2 *with id.* § 3C1.1. This is true even if the second order obstruction results in separate conviction. *Id.* § 3C1.1. Application Note 8. *See also id.* § 2J1.3, Application Note 2.

offers you the chance to avoid 18 months in jail at the risk of increasing your sentence by 6 months.¹¹⁶

Arguably, yet higher orders of detection avoidance are punished even less. Although second order detection avoidance is specifically treated in the sentencing guidelines, orders higher than second are not. By the most plausible reading, however, the enhancement is not two levels *per unit* of higher order obstructive behavior, but two levels per existence of any amount of higher order obstruction. Furthermore, it is arguably the case that n^{th} order detection avoidance cannot generally be detected unless $n-1^{\text{th}}$ order is as well—that the state cannot determine that someone is lying about having lied without first determining that she lied. In that case, there is in effect no additional sanction in the guidelines for third, fourth, or higher orders of detection avoidance. Indeed, while there are many reported cases in which a sentence for obstruction was enhanced for secondary obstruction,¹¹⁷ there appear to be no reported cases additionally enhancing a sentence for third or higher order obstruction.

To the extent that the guidelines still guide, therefore, the federal system punishes first order obstruction by 18 months in prison, second order by 6, and third, fourth fifth, etc.. by zero. And it is interesting to note that this downward slope has recently been steepened as between first and higher orders of detection avoidance by those provisions in Sarbanes Oxley¹¹⁸ that resulted in an increase in the offense level for obstruction from 12 to 14 without also increasing the enhancement for second order obstruction, nor affecting at all the effective sanction for orders higher than two. Staying with the case of midpoint sentencing and no criminal history this translated into an increase of five months in the sentence for first order obstruction with no appreciable increase in the sentences for higher orders.¹¹⁹

Another example of the proposition that the sanctioning hierarchy slopes downward in practice is the state criminal prosecution of Lil'

¹¹⁶ Indeed, no matter what the criminal history and no matter where in each guideline range the judge chooses, the increase in prison time for second order obstruction is always less than the prison time for first. One can see this by noting that the lower bound sentence for offense level 14 exceeds, for all criminal history categories, the difference between the upper bound for offense level 16 and the lower bound for offense level 14. U.S. SENTENCING GUIDELINES MANUAL Ch. 5 Pt. A Sentencing Table.

¹¹⁷ See *supra* note 107.

¹¹⁸ See *supra* note 12 and surrounding text.

¹¹⁹ In fact, the midpoint sentence for second order obstruction actually decreases by one month. The midpoint sentences for no criminal history are 13 months for offense level 12, 18 months for offense level 14 and 24 months for offense level 16. Thus an increase of two offense levels from 12 to 14 is 5 months, while the increase of two levels from 14 to 16 is 6. U.S. SENTENCING GUIDELINES MANUAL Ch. 5 Pt. A Sentencing Table.

Kim, referred to above, who lied to a New York state trial jury about having lied to the grand jury. Lil' Kim has never been indicted for her false statements *at trial*. At sentencing for perjuring herself before the grand jury, though, the prosecutor requested a tougher sentence of two years and nine months on the basis of Lil' Kim's second order lying at trial. In the end, however, making explicit reference to Martha Stewart's ten month sentence (an implicitly, Martha Stewart's similar behavior), the judge sentenced Lil' Kim to only a year and a day.¹²⁰

Therefore, the sanctions structure that we can and actually do impose in the general case, appears to be the opposite of what we would want to do theoretically. When the sanction for second order detection avoidance is lower than the sanction for first, we are effectively magnifying the sanctions-reducing upside of second order detection avoidance while dampening the sanctions-increasing downside. The same applies to detection avoidance of higher orders.

VII. Piggyback sanctions: spoliation instructions, investigative policies, etc...

Sentences for perjury and obstruction are meted out in terms of monetary fines and imprisonment. But these are not the only currencies of punishment, nor are they the only ones actually employed. Several legal doctrines effectively punish detected detection avoidance by increasing the chance of detection *for the underlying violation*.

Consider again the case in which, sued for aiding and abetting fraud, Morgan Stanley stonewalled in discovery. The court initially sanctioned Morgan by shifting the burden of proof. Ordinarily, the plaintiff would have had to prove with a preponderance of the evidence that Morgan did indeed aid and abet fraud. Following the court's initial ruling, Morgan had to prove that it did *not*. The court also specified in its initial ruling that a "statement of evidence" was to be read to the jury explaining that Morgan's stonewalling was relevant to its consciousness of guilt and to the appropriateness of punitive damages.¹²¹ When Morgan's bad behavior continued after this initial ruling, the court amended its order adding a more severe penalty of similar form: essentially that the jury was to take as given that Morgan

¹²⁰ Julia Preston, *Admitting to Lies About Shooting, Lil' Kim Gets One Year in Prison* N.Y. TIMES, Jul. 7, 2005 at B1.

¹²¹ *Coleman Holdings v. Morgan Stanley*, 2005 WL 674885, at *5 (Fla. Cir. Ct. Mar. 23, 2005) (describing Adverse Inference Order). It is not clear from this opinion precisely which burden(s) were shifted—production, persuasion or both.

had aided and abetted the fraud, leaving only the issue whether the plaintiff was in fact influenced and harmed thereby.¹²²

All three of the sanctions in the Morgan case—shifting the burden of proof, adversely instructing the jury, and taking adverse facts as given—act in a similar way. They do not impose separate sanctions on detection avoidance as do the crimes of perjury and obstruction. Rather they sanction the detection avoidance by effectively increasing the probability of sanction *for the conduct whose detection is being avoided*. A nudging instruction suggesting an adverse inference from the defendant’s “spoliation”¹²³ increases the chance that liability is imposed to the extent that the jury is impressionable, sensitive to the cue, or simply would not have thought of the evidence in the manner suggested. Certainly, taking adverse facts as given increases the chance that those facts will be taken as true. And shifting the burden of proof onto the defendant means that all those cases wherein neither party would be able to meet the burden are now cases where the defendant rather than the plaintiff loses.

A sanction of similar effect is meted out by investigators and prosecutors, rather than judges, and is the byproduct of directing investigative resources for underlying violations toward cases that show evidence of obstruction. The SEC, for example, might explicitly announce a kind of counterpunch strategy: should it come across evidence of obstructive behavior in the course of investigating insider trading, for instance, it would respond by stepping up the investigation *of the insider trading*. There is some evidence that the SEC and other regulatory bodies do follow such a policy.¹²⁴

¹²² Coleman Holdings v. Morgan Stanley, 2005 WL 674885, at *9 (Fla. Cir. Ct. Mar. 23, 2005).

¹²³ “Spoliation is a broad term including the destruction, suppression, or concealment of tangible evidence as well as flight from the scene of the crime or from the jurisdiction. CHARLES ALAN WRIGHT & KENNETH W. GRAHAM, JR., FEDERAL PRACTICE AND PROCEDURE: EVIDENCE §§ 5178, 5181 n1 (2005). Spoliation is sometimes referred to as “badges of fraud” or “badges of guilt.” See, e.g., Samuel W. Buell, *Concealment and Novel Fraud* (Aug. 24, 2005) (unpublished manuscript, on file with the author) (advocating use of “badges of guilt” to determine consciousness of “wrongdoing” to, in turn, determine guilt in white collar crime cases where novel behavior is not clearly fraudulent under existing law).

¹²⁴ Carberry & Gordon, *supra* note 36, at 1 (“Securities crimes that include evidence of obstruction are ...more likely to be prosecuted because of the importance to protect the system.... [A]s in the perjury and obstruction cases, the falsification of records or filings will be a factor weighing heavily toward prosecution, even if the conduct being covered up, standing alone, would not be prosecuted.) See also Memorandum from Deputy Attorney General Larry D. Thompson to United States Attorneys, Principles of Federal Prosecutions of Business Organizations (Jan. 20, 2003), available at http://www.usdoj.gov/dag/cftf/business_organizations.pdf (last visited Nov. 29, 2004) (“Another factor to be weighed by the prosecutor [in deciding whether and how to prosecute] is whether the corporation, while purporting to cooperate, has engaged in conduct that impedes the investigation [whether or not rising to the level of criminal obstruction]. Examples of such conduct include: overly broad assertions of corporate representation of employees or former employees; inappropriate directions to employees or

The seemingly compelling notion behind this kind of obstruction-targeting of investigative resources is that it renders obstruction ineffectual. Obstructive behavior designed to foul a given level of detection effort by the regulator—to the extent that it is itself detected—simultaneously increases the regulator’s level of detection effort. The intended effect is presumably to neutralize the impact of obstructive behavior on the probability of detection for insider trading.

This policy is similar in effect to burden shifting, nudging instructions, and taking facts as given. The regulator’s counter-responsive increase in detection effort acts as a sanction on obstructive behavior. And here again, the sanction is an increase in the probability of detection for the underlying wrong, thus riding on the back of the lower order sanction.

In evaluating all such piggyback sanctions, the first thing to note is that, despite their initial appeal, they are subject to the same basic issue as sanctioning detection avoidance straight up. They too suffer from detection avoidance’s recursive nature. These policies condition a negative consequence for the detection avoider upon detection of her detection avoidance. Thus, while they do discourage detection avoidance in the first instance, they also encourage the detection avoider to avoid detection of her detection avoidance. Now, in contrast to perjury and obstruction, the negative consequence for the perpetrator is not a separate, higher order sanction, but rather an increased chance of being sanctioned for the lower order wrong. But, for the proposition that recursion is still a problem, the distinction is irrelevant. All that matters is that the consequence is negative and that it is conditioned on detection of the detection avoidance.

In fact, the second thing to note is that piggyback sanctions not only fail to avoid the recursion problem, they exacerbate it. This is because they amount to imposing a sanctioning hierarchy that

their counsel, such as directions not to cooperate openly and fully with the investigation including, for example, the direction to decline to be interviewed; making presentations or submissions that contain misleading assertions or omissions; incomplete or delayed production of records; and failure to promptly disclose illegal conduct known to the corporation.”); Sandra Rubin, *Whose Lawyer Are You Now?*, available at <http://www.zsa.ca/En/Articles/article.php?aid=1077> (last visited July, 26 2005) (reporting on statements of Stephen Cutler, then SEC director of enforcement, to a Practising Law Institute panel: “many in the defense bar believe has led the SEC to become more aggressive in requesting waivers of attorney-client privilege and in using the stick of higher penalties for non-co-operation against corporations it is investigation...Mr. Cutler got some hear from fellow panelists who made it clear they view the increasingly regular demands of SEC staff and U.S. Justice Department official with frustration and alarm. They said frequent requests for waiver of privilege and the expectation that internal information will be shared, coupled with the high cost of non-co-operation, are eroding lawyers’ ability to do their jobs.”)

decreases in the order of detection avoidance. As we saw in the previous Part, a decreasing sanctions hierarchy encourages detection avoidance. We saw there, in particular, that when the sanction for first order detection avoidance is greater than the sanction for second order detection avoidance, then the sanction that second order avoidance avoids is greater than the sanction that it invites. Accordingly, second order detection avoidance is encouraged on net.

Applied as well to the special case of second order detection avoidance, piggyback sanctions work as follows. If the individual is caught for *first* order detection avoidance (the underlying wrong with respect to second order detection avoidance), she incurs the sanction therefor. If the individual is caught for *second* order detection avoidance, her effective sanction is an increase in the likelihood that she will incur the sanction for first order detection avoidance. The point is that the latter sanction is always smaller. Punishing someone by definitely sanctioning them (in the event of detection) is more severe than punishing them by increasing *the chance* that they will have to pay that same sanction.

For example, suppose that the sanction for first order detection avoidance is \$500,000 and suppose that the punishment for second order detection avoidance is that it increases the chance of having to pay this \$500,000 sanction from 50% to 90%. Then the effective sanction for second order detection avoidance is 40 percentage points of \$500,000, or \$200,000, which is, of course, less than \$500,000.

The same analysis applies to first, rather than second order detection avoidance, a more familiar context for piggyback sanctions. For every percentage point that destroying documents reduces the chance of liability, the defendant saves one percent of the damages that would be imposed. For every percentage point that the document destruction increases the chance of having to suffer an adverse jury instruction, the defendant incurs one percent of the value of *some instruction-induced increase in the chance of having to pay the same damages*. The effect of such an implicitly decreasing sanctioning structure, taken as a whole, is to induce detection avoidance, not deter it.

VIII. The technological approach and its quiet prevalence

All of these problematic approaches to detection avoidance have in common that they condition negative consequences—whether separate sanctions or piggyback sanctions—on the detection of

detection avoidance, thereby encouraging higher order avoidance just as they discourage lower.

But sanctioning an activity is not the only approach to discouraging it. Against her private benefits from the violation the potential violator weighs, in fact, two sorts of costs; not just the expected cost of sanctions, but also the “direct cost” of realizing the activity’s private benefits. In lieu of imposing legally constructed costs on an activity, therefore, the law can potentially discourage an activity by increasing its direct cost.

In the special case of detection avoidance, this direct approach attacks the “technology” by which offenders convert their time, effort and expenditure into reductions in the probability of detection. The point of attack is the design of evidentiary process, inclusive of investigative techniques and policies.

To be sure, decreasing the technological productivity of law violations is a time-honored strategy in public—and private—enforcement. Steel vaults increase the cost of bank robbery. Steering wheel locks increase the cost of car theft. Airport security increases the cost of hijacking.¹²⁵ The claim here is not to have invented the technological approach. Rather, the claim is two-fold.

First, the technological approach to detection avoidance avoids the recursivity problem that specially plagues attempts to sanction such activities. The technological approach therefore has an advantage over sanctioning in the case of detection avoidance that is not also present in the case of underlying violations like bank robbery, car theft, and hijacking.

Second, as this first factor may help to justify and explain,¹²⁶ the law does in fact rely more on the direct approach and less on sanctions—

¹²⁵ For recent manifestations of this idea see Katyal, *Deterrence’s Difficulty*, *supra* note 112, at 2439-2441 (proposing methods to increase the cost of dealing drugs); Neal Kumar Katyal, *Architecture as Crime Control*, 11 YALE L.J. 1039, 1043 [hereinafter Katyal, *Architecture*] (arguing that “increasing an area’s natural surveillance (its visibility and susceptibility to monitoring by private citizens), introducing territoriality (by demarcating private and semiprivate spaces), reducing social isolation, and protecting potential targets” can deter crime by increasing the cost of perpetration); and Neal Kumar Katyal, *Criminal Law in Cyberspace*, 149 U. Pa. L. Rev. 1003, 1012-1013 (2001) [hereinafter Katyal, *Cyberspace*] (examining strategies to increase the technological cost of computer crimes: “first-party strategies (preventing offenders from committing acts by raising perpetration costs and legal risks), second-party strategies (encouraging victims to protect against attacks, thereby making it more expensive for criminals to commit crimes and easier for them to get caught), and third-party strategies (relying on ISPs and other entities to monitor risky activity and forestall attacks through architectural solutions.”).

¹²⁶ Another reason that the technological approach is especially suited to detection avoidance is that the technology of detection avoidance is relatively pliable. The technology of detection avoidance is intimately determined by the state itself in the manner in which its designs adjudication. The levers of state influence are thus more solidly attached and more

in practice, if not on paper—with regard to detection avoidance as compared to primary activity violations.

The current Part takes up the second of these claims. Part IX explains the mechanics of the technological approach. And Part X explains what practical steps the law can and does take to dampen the productivity of detection avoidance.

Indictments and convictions for perjury and obstruction are sensational events and so more likely than most aspects of evidentiary procedure to appear on the front pages of newspapers (not to mention the introductory pages of law review articles). But an investigation of evidentiary procedural law that runs deeper and broader than a survey of headlines indicates that, in fact, perjury, obstruction, and sanctioning in general is not the bread and butter of the law's approach to detection avoidance. In fact, the law quietly disfavors the sanctioning approach, opting instead for a direct technological attack on the productivity of detection avoidance spending.

Consider, first, that much detection avoidance is not criminal, nor even subject to procedural sanction. Grossly misleading, yet technically true statements are generally not perjurious, for example.¹²⁷ Similarly, document destruction, witness coercion and other forms of obstructive behavior are usually not criminal unless they are targeted toward a specific official proceeding or investigation. In some cases that proceeding or investigation must have already commenced.¹²⁸ In most cases, it must at least be specifically anticipated.¹²⁹

deeply seated for detection avoidance than for most other regulated activities. *Cf.*, Katyal, *Cyberspace*, *supra* note 125, at 1012-1013 (examining strategies to increase the technological cost of computer crimes and pointing to the artificiality of internet architecture as a source of malleability); Katyal, *Architecture*, *supra* note 125, at 1043 (suggesting that realspace architecture can also be designed to decrease the productivity of realspace criminal activity).

¹²⁷ *Bronston v. United States*, 409 U.S. 352 (1973) (holding that a statement must be literally false to be perjurious under 18 U.S.C. § 1621); *United States v. Reveron Martinez*, 836 F.2d 684, 689 (1st Cir. 1988) (extending holding in *Bronston* to 18 U.S.C. § 1623).

¹²⁸ *United States v. Aguilar*, 515 U.S. 593, 600 (1995); Oesterle, *supra* note **Error! Bookmark not defined.**, at 1201-02 (“[S]ection 1503 apparently allows parties to destroy any documents, even those relevant to future civil actions, if the destruction occurs before the complaint is filed.” (referring to 18 U.S.C. § 1503)).

¹²⁹ *See, e.g.*, *Arthur Andersen, LLP v. United States*, 125 S. Ct. 2129, ___ (2005) (interpreting 18 U.S.C. § 1512(b) “A ‘knowingly ... corrup[t] persuaude[r]’ cannot be someone who persuades others to shred documents under a document retention policy when he does not have in contemplation any particular official proceeding in which those documents might be material.”)

A similar pattern characterizes procedural, as opposed to criminal sanctions. Only egregious stonewalling in discovery is sanctionable; Morgan Stanley's recent comeuppance, as described above, is atypical.¹³⁰ Federal Rule of Civil Procedure 11, which, *inter alia*, sanctions civil defendants who deny in their answers factual assertions that they know to be true, is generally regarded as "toothless."¹³¹ And evidence destruction in the context of an ongoing "document retention policy" is neither criminally obstructive, nor grounds for burden shifting, nor even grounds for issuance of an instruction alerting the jury to inferences it might draw from a party's failure to produce.¹³²

Second, what evidence there is suggests that even when detection avoidance rises to a sanctionable level, sanctions are rarely imposed. The view that sanctionable detection avoidance is rampant and that the law most often looks the other way is surprisingly ubiquitous among scholars, attorneys, and judges.¹³³ (There have even been attempts to support this view with systematic empirical evidence¹³⁴—though a close examination of these findings casts serious doubt on their relevance, despite their frequent citation.¹³⁵)

What explains the law's apparent indifference toward sanctioning procedural crimes and violations? Judge Posner and others ascribe the attitude to the generally held view "that the court system has been designed, or at least has evolved, to be robust in the face of the known inefficacy of the oath and of the threat of prosecution for perjury [and obstruction]... and as result, of the frequency of these

¹³⁰ See Oesterle, *supra* note **Error! Bookmark not defined.**, at 1188 (arguing that "existing laws on the consequences of document destruction are too lenient"). *But see* Nesson, *supra* note **Error! Bookmark not defined.**, at 806 (1991) ("Existing rules are more than adequate.").

¹³¹ Communication from the Chief Justice of the United States Transmitting Amendments to the Federal Rules of Civil Procedure and Forms, Pursuant to 28 U.S.C. 2072, reprinted in 146 F.R.D. 507, 507 (1993) (Scalia, J., dissenting, joined in relevant part by Thomas, J.).

¹³² Arthur Andersen, LLP v. United States, 125 S. Ct. 2129, ___ (2005) ("It is, of course, not wrongful for a manager to instruct his employees to comply with a valid document retention policy under ordinary circumstances."). *Cf.*, *Levy v. Remington Arms Co.*, 836 F.2d 1104, ___ (8th Cir. 1988) (requiring for purposes of providing a spoliation instruction under the court's inherent powers that a document retention policies be, *inter alia*, "reasonable"). *But see* Sanchirico, *Evidence Tampering*, Part II.B.2.c at 1275-1279 (questioning the relevance of *Levy* despite its frequent citation in the scholarly literature).

¹³³ See, e.g., Harris, *supra* note **Error! Bookmark not defined.**, at 1771-72 (1996); Nesson, *supra* note **Error! Bookmark not defined.**, at 806-07 (1991) ("[I]n practice, judges are extremely reluctant either to expose discovery violations or to punish discovery violations once exposed, applying the rules instead in ways that minimize or avoid the problem."); POSNER, *supra* note 50, at 147 (1999). *See also* Sanchirico, *Evidence Tampering*, *supra* note **Error! Bookmark not defined.**, Part I.A. at 1230 (describing this general agreement).

¹³⁴ See *supra* note 52.

¹³⁵ Sanchirico, *Evidence Tampering*, *supra* note **Error! Bookmark not defined.**, at 1231-1245 (2004) (critiquing these studies and their use in legal scholarship).

crimes...”¹³⁶ Such robustness implicates deep structural features of evidentiary procedure that reduce the technological productivity of detection avoidance, features that are ubiquitous in the design and daily practice of legal process, as detailed in Part X.

IX. Mechanics of the technological approach

Before examining what the law can and does do to reduce the productivity of detection avoidance, it is worth clarifying what such productivity reductions accomplish and why they are likely to be superior to sanctioning.

A. Effect on detection avoidance

Reducing the returns from an investment reduces the amount that individuals invest therein. In the same way, reducing the return from detection avoidance reduces the resources that detection avoiders devote to avoiding detection.

In more detail, imagine that an offender, having violated the law, is now deciding whether or not to spend some fixed amount of money, say \$100,000 on detection avoidance.¹³⁷ Whether this makes sense for her depends on what she gets in return for that expense. This, in turn, depends on several factors. If, to clarify the presentation, we imagine that detection avoidance is itself not separately sanctioned, then two factors predominate.

The first factor is the magnitude of the sanction that will be imposed upon detection. The second factor is the “productivity” of the detection avoidance spending: the amount by which the \$100,000 expense reduces the probability that the underlying violation will be detected. Increasing either the sanction or the productivity of

¹³⁶ POSNER, *supra* note 50, at 147. *See also* Harris, *supra* note **Error! Bookmark not defined.**, at 1771-72 (1996) (“Increasingly, the attitude of judges and lawyers toward perjury is one of acceptance and tolerance. They have resigned themselves to the fact that perjury is an inevitable outcome of an adversarial system of justice which the legal system may just have to tolerate. Furthermore, prosecutors do not believe that it is a serious problem they need to be concerned with. They point out that it is the jury's job as the factfinder to assess the credibility of the witnesses and evidence and ascertain the truth. By the end of a trial, unreliable testimony and evidence have been rejected, truthful testimony and evidence considered, and an outcome determined. Because most prosecutors believe that the problem of perjury has been resolved by the conclusion of the trial, they argue that it is a waste of valuable resources to then pursue perjury charges arising out of that proceeding, rather than committing those resources to investigating and prosecuting more important crimes that are overloading the court's docket.”).

¹³⁷ The appendix considers the more general case wherein the offender may spend any amount on detection avoidance. In this broader context, the technological attack operates by reducing, at all points, the marginal productivity of detection avoidance spending, defined loosely to be the change in the probability of detection per additional dollar spent on detection avoidance.

detection avoidance increases the return from the \$100,000 detection avoidance expenditure. The larger the sanction, the more valuable each percentage point reduction in the detection probability. The greater the percentage point reduction, the more units of this per point value procured.

Conversely, therefore, *reducing* the productivity of detection avoidance is one way to discourage the violator from spending the \$100,000. If, for example, the sanction is fixed at \$1,000,000, then the (risk neutral) violator values each percentage point reduction in the probability of sanction as the equivalent of a certain gain of \$10,000. She will then spend the \$100,000 on detection avoidance only if doing so reduces the probability of detection by at least ten percentage points. The object of the technological approach—as manifest in this simple example—is to conspicuously bring the productivity of detection avoidance down below ten percentage points, so that the offender decides not to spend the \$100,000.¹³⁸

1. Bounded rationality

Do people really behave like this? Perhaps the violator has it in her mind that she is going to spend \$100,000 on detection avoidance irrespective of its productivity. Or perhaps she is dedicated to reducing the probability of detection by ten percentage points

¹³⁸ Three technical notes are in order. First, if only some orders of detection avoidance are affected in the first instance by the direct attack, will this induce a compensating increase in expenditure on other orders? Not likely. As noted in Part V.B, orders of detection avoidance activity are, if anything, complements, not substitutes. This means that reducing the productivity of some orders of detection avoidance and not others reduces spending on all orders of detection avoidance. Lower effort expended on orders whose productivity has been directly reduced by policy are likely to indirectly lower the productivity, and the expenditure on excluded orders as well. The sanctioning approach also benefits from this complementarity. Unlike the technological approach, however, it steps on this benefit by simultaneously and directly encouraging higher orders of detection avoidance.

Second, what about the “income effect”? When we increase the price of apples the consumer may respond by consuming more apples if the income effect is positive and dominant. Isn’t it then possible that the offender will respond by decreasing *or* increasing detection avoidance spending when its productivity declines? But the analogy is actually inapt. A better analogy is between lowering the productivity of detection avoidance and lowering the marginal utility of apples. When we lower the marginal utility of apples, there is no income effect and the consumer consumes fewer apples (assuming that doing so does not substantially lower the marginal utility of other goods).

Third, more of caveat than an objection, is the fact that decreasing the marginal productivity of detection avoidance spending is not equivalent to increasing the marginal cost of detection probability reductions. For example, the rightward horizontal translation of a probability curve $p(a)$ that decreases in detection avoidance expenditure at a decreasing rate keeps the slope constant at each probability p (and so keeps the marginal cost constant) but increases the slope at each level a of detection avoidance spending (and so increases the marginal productivity). As shown in the appendix, a marginal productivity reduction implies, but is not implied by an increase in marginal cost for this kind of curve. This is important because merely increasing the marginal cost of probability reductions will cause the violator to “buy” fewer units of reduction, but each unit will cost more and the result may not be a decrease in detection avoidance spending.

whatever the cost, in which case the less productive her spending, the *more* she will spend to accomplish her goal.

Such boundedly rational decision making may indeed affect the efficacy of the technological attack. But ultimately the analysis here is comparative. And so one must recognize that departures from rationality affect the efficacy of sanctioning detection avoidance as well. If violators do not respond to productivity decreases, why should they respond to sanctions? Indeed, we are free to think of a sanction on detection avoidance as reducing that activity's "productivity." We need only subtract the additional cost of sanctions above, rather than below the line defining that concept. Precisely when we do the subtraction is a purely analytic choice and is unlikely to be a source of real difference in behavior.¹³⁹

B. Effect on deterrence of underlying violations

The technological approach not only discourages detection avoidance, it also enhances deterrence of the underlying violation. A legal sanction has less deterrent force if there is an easy way around it. Conversely, blocking that dodge—or at least increasing its cost—increases the sanction's impact.

Suppose, for example, that \$11,000 of detection avoidance decreased the probability of detection by ten percentage points. Given a sanction \$1,000,000, such an expenditure would be worthwhile. And in making it the offender would be effectively substituting a \$11,000 payment (in terms of detection avoidance spending) for a \$100,000 payment (in terms of reduction in expected sanction). This favorable substitution would lower the all-in cost of the underlying violation by \$89,000. Now suppose that we are able to reduce the productivity of \$11,000 of detection avoidance spending from eleven percentage points to one, so that the reduction in expected sanction was only \$10,000. The offender would no longer find the detection avoidance spending worthwhile. More to the present point, however, detection avoidance would not operate to decrease the all-in cost of the underlying violation. In effect the cost of the violation would be \$89,000 greater after the productivity reduction.¹⁴⁰

¹³⁹ It should also be recognized that there is in fact a small but growing body of systematic evidence indicating that offenders as a group do indeed respond to the possibility of sanction by reducing underlying violations. Levitt & Miles, *supra* note 23, (reviewing advances in testing for the deterrent effect of laws). If the behavioral association drawn in the preceding paragraph—between raising sanctions and reducing productivity—is valid, this body of evidence also implies that offenders respond to decreasing the productivity of detection avoidance by engaging less in the activity.

¹⁴⁰ In fact, decreasing the productivity of detection avoidance increases deterrence of the underlying wrong even if it does not discourage detection avoidance, as can be seen in the

Of course, lowering the productivity of detection avoidance can never increase the effective sanction above a 100% probability of paying the legal sanction itself. Spending nothing on detection avoidance is always an option. But again the analysis is comparative. And the effect on underlying deterrence of sanctioning detection avoidance is bounded in precisely the same way.

C. Public detection costs

Reducing the productivity of detection avoidance is not all good news. Productivity reductions are likely to come at the price of additional public “detection” costs. Decreasing the effectiveness of the detection avoidance dollar may, for example, require more costly surveillance systems or more lengthy and numerous interrogation sessions.

But these additional costs hardly defeat the argument for the technological approach. For the sanctioning approach is *also* likely to require additional public “detection” costs. Sanctioning efforts to obstruct primary process—whether by use of procedural rules or the criminal law—requires additional, costly process.

To be sure, scale economies may reduce the cost of such higher order process. Prosecutors are sometimes said to pile obstruction and perjury charges onto primary activity indictments.¹⁴¹ When a suspect on some underlying violation is also suspected of obstructing justice, some of the costs of investigating and adjudicating the obstruction can be shared with prosecution of the primary violation.

Yet the additional costs of prosecuting procedural violations are still likely to be substantial. The *actus reus* of obstruction is often quite different from the *actus reus* of the underlying crime. The obstructive act is apt to have occurred at a different time and place with a different set of potential witnesses and a different array of alibis. In fact, if the piling on effect is real and recognized, obstructers have an incentive to make this so.

Moreover, the *mens rea* of obstruction crimes are orthogonal to those of the underlying wrong. Proving that a defendant obstructed justice generally requires proving that she had in mind a particular ongoing or imminent proceeding or investigation and that her intentions were “wrongful.”¹⁴² Proving that a witness committed perjury requires showing not just that her statement was logically false, but also that

example by positing that the productivity of detection avoidance is lowered from twelve to eleven probability points.

¹⁴¹ See Oesterle, *supra* note **Error! Bookmark not defined.**, at 1204.

¹⁴² See, e.g., *Arthur Andersen, LLP v. United States*, 125 S. Ct. 2129, ____ (2005).

the falsity was willful or at least knowing, a showing that typically requires additional investigation, evidence, and deliberation.¹⁴³

Furthermore, detection avoidance that occurs far downstream along the procedural flow—as opposed to detection avoidance that can be charged in the original indictment or claimed in the original complaint—will often require separate costly hearings with less access to the benefits of the scale economies of consolidated process. The lengthy sequence of motions and orders in the Morgan Stanley case for example, lasted from April 2004 to March 2005 and involved several sets of briefs and hearings.¹⁴⁴

And let us not forget that prosecuting process crimes often requires a cumbersome and imperfect administrative hand off. The SEC, for example, has no authority to bring criminal actions. Should the SEC come upon evidence of criminal obstruction in the course of investigating or prosecuting a civil action for securities fraud, it must refer the matter to the Department of Justice.¹⁴⁵ Any economies of scale in prosecuting both underlying civil violations and process crimes must to some extent be dissipated in this bureaucratic transfer. Indeed, some amount of separation between civil and criminal prosecutions is specifically enforced in order to prevent criminal prosecutors from end-running limitations on discovery in criminal actions by tapping into expanded discovery in a parallel civil action.¹⁴⁶

D. Summary comparison with sanctioning

What we are left with, then, are two policy alternatives—sanctioning and the technological attack—that are similar along two dimensions in the social calculus, but quite different along a third. They both increase primary deterrence and they both incur public detection costs. But the technological attack affirmatively reduces private detection avoidance costs, while the sanctioning approach—in any feasible manifestation—increases them.

¹⁴³ See, e.g., 18 U.S.C. 1621, 23.

¹⁴⁴ *Coleman Holdings v. Morgan Stanley*, 2005 WL 674885 (Fla. Cir. Ct. Mar. 23, 2005).

¹⁴⁴ *Coleman Holdings v. Morgan Stanley*, 2005 WL 674885, at ___ (Fla. Cir. Ct. Mar. 23, 2005) (describing motions and orders)

¹⁴⁵ See, e.g., Alyssa Hall & Adam M. Schoeberlein, *Securities Fraud*, AM J. CRIM L. 941, 995 (2000)

¹⁴⁶ For example, among the criminal charges facing HealthSouth CEO Richard Scrushy were three counts of perjury arising from an SEC deposition in a parallel civil action arising from the same set of transactions and occurrences. The judge dismissed the perjury charges, however, because Justice Department officials working on the criminal side were deemed to have been too closely involved in the civil deposition. *U.S. v. Scrushy*, (N. D. Ala, April 15, 2005) (CR-03-BE-0530-S) (mem. and order)

X. Methods of technological attack

How then do we go about decreasing the productivity of detection avoidance?

It is clear that merely devoting additional public resources to detecting violations will not do. Simply questioning yet another witness, for example, will not necessarily decrease the productivity of detection avoidance spending. If without coaching, the witness's answers will increase the chance of having to pay a \$100,000 sanction by ten percentage points, but with \$5000 of "preparation" this can be wholly prevented, then interrogating an additional witness will most likely increase, rather than decrease the productivity of detection avoidance spending.

Rather public detection spending must be specifically channeled so that each dollar, each hour, each erg of effort spent avoiding detection buys less of a reduction in the probability of detection. This is essentially a matter of making detection avoidance more difficult at each step—so that, for example, \$5000 of witness coaching only *partially* prevents the witness's positive impact on the probability of detection. Accordingly, one natural approach is to design evidentiary process so as to exploit and amplify the difficulties generally encountered in all human endeavors. The idea is to employ these generally detrimental difficulties for the social good by using them against the maleficent detection avoider. Two difficulties, of cognition and of cooperation, have special potential.

A. *Difficulties of cognition*

Imagine that the offender wishes to reduce the probability of detection by supplying a witness to swear (falsely) that the offender did not commit the underlying crime. Exploiting the witness's cognitive limitations, the law takes several steps to reduce the productivity of time and effort spent preparing this witness.¹⁴⁷

Consider, first, that the witness must generally respond to questioning from memory.¹⁴⁸ In order to provide consistent and detailed answers, the fabricator must memorize both her main storyline and her answers to those interrogative spurs that she can anticipate. Moreover, given her cognitive inability to anticipate all possible questions, she will also have to memorize on the fly the

¹⁴⁷ Sanchirico, *Upside of Cognitive Error*, *supra* note 38 at 317-325 (describing these steps in more detail)

¹⁴⁸ To the extent that the witness is permitted to refer to notes and cues, these will generally be made available to the questioner, and are therefore of limited efficacy. See, e.g., FED. R. EVID. 612 (governing disclosure to opponents of writings used to refresh memory)

answers she gives to questions that she did not expect. These spontaneous answers may determine the consistency of later answers to unanticipated questions, and may even necessitate changing part of her prepared story going forward—which change must itself be memorized on the spot.

Of course, the questioner's memory is also limited. But the questioner is generally permitted to make use of whatever cognitive aids she pleases without any obligation to share these with the other side.¹⁴⁹ And indeed using computer software like Trial Director and Summation, she can instantaneously check the consistency of a witness's answer with her own prior remarks or other evidence.¹⁵⁰ Such software is increasingly employed by questioners in deposing and interrogating witnesses. By allowing the questioner the full range of cognitive aids, while limiting the technology available to the questioned, the law severely reduces the productivity of effort exerted by the questioned in fabricating testimony. As a result of this lopsided technological restrictiveness, each additional hour spent preparing for testimony yields much less in terms of reduced detection probability percentage points. The productivity of training for a race is low when your opponent can use a bicycle but you must run on foot. Best not to enter the race at all.

Witness preparation is also rendered less productive due to three specific aspects of how testimony, depositions, and interrogations generally proceed. First, the questioner will usually not see the questions in advance.¹⁵¹ Time spent preparing answers to the questions that one *can* anticipate is thereby less productive for the fact that such preparation may well be rendered essentially worthless with a few poorly improvised answers to questions that were

¹⁴⁹ See, e.g., Fed. R. Civ. P. 26(b)(3) (providing that documents and tangible things prepared in anticipation of litigation are discoverable only upon a showing of substantial need and a practical inability to obtain materials by other means, and that even when discovery of such materials is permitted, mental impressions, conclusions, opinions, and legal theories are still protected); *Hickman v. Taylor*, 329 U.S. 495, 511-13 (1947) (explicitly protecting against disclosure of mental impressions, etc., outside the context of the discovery of documents and tangible things; codified in part in FED. R. CIV. P. 26(b)(3)).

¹⁵⁰ See Summation Legal Techs., Inc., Summation Legal Technologies, Inc.: America's #1 Litigation Support Software, at <http://www.summation.com> (last visited July 26, 2005); inData Corp., Welcome to inData Corporation, at <http://www.trialdirector.com> (last visited July 26, 2005).

¹⁵¹ Of course, she may be asked the same questions at trial that she was asked on deposition or during interrogation. The point is that the first time she encounters the questions her on the spot answers will go on record. If this first time is on deposition, and she says something at trial that is inconsistent with her on the spot answer on deposition, her deposition answer is often admissible at trial for the truth of the matter asserted. See, e.g., FED. R. EVID. 801(d)(1)(A). If the first time is during interrogation, her earlier answers cannot generally be admitted for substantive use, but can be used to impeach her credibility should she give inconsistent testimony given at trial. See, e.g., FED. R. EVID. 613 (providing procedural rules for impeachment use of prior inconsistent statements).

unexpected. One inconsistent ad-lib may be enough of a wedge to crack open an otherwise impregnable fabrication.

Second, the questioner need not commit to her questions ahead of time, but may rather adjust the subject or tenor of additional questions based on what she perceives to be uncertainties and inconsistencies in the answers provided to previous questions. This renders preparation less productive because the witness is denied the opportunity of playing the odds that particular topics will not be tested. The less the questioner prepares for a line of questioning, that is, the more it will be emphasized. Conversely, the *more* the questioner prepares for a line of questioning, the *less* it will be emphasized. Preparation is thus rendered less valuable. Diligently preparing for a particular set of questions makes it more likely that such questions will be ignored once the questioner discovers that this avenue of interrogation is not fruitful.

Lastly, interrogations and depositions exploit the effects of fatigue. The difficult task of fabricating testimony becomes all the more difficult as the fabricator tires. While interrogators and deponents may substitute in and out during questioning, the witness is on her own. To be successful, therefore, the witness's preparation must enable her to so internalize her story that reciting it and maintaining it becomes nearly as rote as those few other cognitive tasks—like remembering one's address and phone number—that can still be reliably accomplished by those who are mentally drained. Hours of preparation can be rendered virtually ineffective by a few unguarded answers in the last few moments of a long day of questioning.¹⁵²

B. Difficulties of cooperation

Game theorists, especially those studying “mechanism design,” have long recognized the possibility of exploiting the difficulties and fragilities of coordination and cooperation among multiple agents.¹⁵³

¹⁵² The procedural devices just described also hamper the sincere witness. But as argued in detail in Sanchirico, *Upside of Cognitive Error*, *supra* note 38, at 317-344 their effect is greater on the insincere witness given the higher cognitive faculties that fabrication requires. What matters is the differential effect.

¹⁵³ See, e.g., Jacques Crémer & Richard P. McLean, *Full Extraction of the surplus in Bayesian and Dominant Strategy Auctions*, 56 *ECONOMETRICA* 1247 (1988) (describing the exploitation of correlations in bidders' private information in the design of auctions); DREW FUDENBERG & DAVID LEVINE, *GAME THEORY* 293 (1990) (describing the “shoot them all” mechanism whereby the principal learns information that is perfectly shared by multiple agents); Paul Milgrom & John Roberts, *Relying on the Information of Interested Parties*, 17 *RAND J. ECON.* 18, 25 (1986) (showing that where two informed parties with opposite interests can omit but not fabricate, Nash equilibrium reports reveal full information); John Moore & Rafael Repullo, *Subgame Perfect Implementation*, 56 *ECONOMETRICA* 1191 (exploring how equally informed agents can be played off against each other in a sequential mechanism); Chris William Sanchirico, *Games, Information, and Evidence Production*, 2 *AMER. L. & ECON. REV.* 342, 350-52 (modeling use of one party's evidence to set the other's litigation payoffs).

These lessons apply to reducing the productivity of detection avoidance activity. Indeed this is one setting in which the Prisoners' Dilemma is not just a metaphor.¹⁵⁴

Detection avoidance, like any human activity, often requires or is facilitated by coordination among several individuals, especially if it is effected on a large scale. The state can play these individuals against each other by structuring interrogation and prosecution to amplify the temptation to break rank. "For crimes in which the core of the offense is false information, perjury, obstruction, false filings and false books and records, cooperating criminals are frequently the key source of information."¹⁵⁵ The increased difficulty of remaining coordinated thus increases the cost of successful cover up.

Specific practical techniques employed by law enforcement in this area include, first, the hearsay exception for statements of a co-conspirator. Statements made by a co-conspirator (during the pendency of the conspiracy and in furtherance thereof) may be used substantively against a party even if they are not made for the purpose of testifying in the current case.¹⁵⁶ It is not enough, therefore, to carefully guard one's own statements regarding perpetration of the crime. One must also guard the statements made by one's partners, which for hearsay purposes will be treated as if they are one's own.

Other devices include prosecutorial immunity,¹⁵⁷ plea agreements,¹⁵⁸ non prosecution agreements,¹⁵⁹ and special protection for whistleblowers.¹⁶⁰ All of these make cooperation in detection avoidance harder to maintain and thus reduce the usual productivity gains from teamwork. Thus, in covering up evidence of a law violation, two "shovels" may be putatively more productive than one. But then another person knows where the bodies are buried. And all

¹⁵⁴ Professor Katyal has recently described specific ways in which the law (as principal) accomplishes this task via the doctrine surrounding conspiracy. Neal Kumar Katyal, *Conspiracy Theory* 112 YALE L.J. 1307 (2003).

¹⁵⁵ Carberry & Gordon, *supra* note 36. For example, in government's financial fraud case against HealthSouth CEO, Richard Scrushy more than a dozen of Scrushy's former subordinates pled guilty and testified for the government. Milt Freudenheim, *New Indictment for Ex-Chief of HealthSouth*, N.Y. TIMES, Sep. 30, 2004, at C5. Scrushy was acquitted in this case, but still faces the prospect of a civil suit by the SEC and various private suits. Andrew Ward, *Scrushy Facing Civil Suit after Acquittal*, FIN. TIMES, July 6, 2005, at 30.

¹⁵⁶ See, e.g., FED. R. EVID. 801(d)(2)(E)

¹⁵⁷ See, e.g., 18 U.S.C. §§ 6001-6005

¹⁵⁸ See, e.g., UNITED STATES ATTORNEYS' MANUAL 9-27.420 Plea Agreements—Considerations to be Weighed ("In determining whether it would be appropriate to enter into a plea agreement, the attorney for the government should weigh all relevant considerations, including: 1) The defendant's willingness to cooperate in the investigation or prosecution of others...")

¹⁵⁹ See, e.g., UNITED STATES ATTORNEYS' MANUAL 9-27.600 Entering into Non-prosecution Agreements in Return for Cooperation – Generally, et seq...

¹⁶⁰ See, e.g., 18 USC § 1513.

the effort expended inearthing the evidence is rendered ineffective if that person is also helpful to authorities in guiding them to the broken ground.

XI. Conclusion

Day in and day out, prosecutors and regulators, judges and juries, struggle against the headwind of offenders' efforts to impede the discovery and prosecution of wrongdoing. But the areas of basic legal research that ought to help us to understand and ameliorate this costly resistance remain largely silent on the topic. Scholarship on evidentiary procedure skews heavily toward the problems of disinterested and sincerely mistaken witnesses, leaving the problems of purposeful evidentiary tampering largely untended. The theory of public enforcement, on the other hand, focuses almost exclusively on governmental efforts to detect violations, with little to offer on violators' efforts to avoid detection.

This article has attempted to address this scholarly oversight, with an eye toward the practical problems now confronting legal policy in this area. While the recent incremental policy trend has been toward sanctioning detection avoidance activities, this article suggests that a better course may be to intensify what has always been the law's chief mode of attack, namely designing evidentiary procedure to render such activities cost ineffective.

Both sanctioning detection avoidance and reducing its technological productivity enhance deterrence of underlying violations. And both do so in return for additional public spending. But their effects on the social waste of detection avoidance activities differ markedly. The ability of sanctions to curtail the social cost of detection avoidance is restricted by the special recursivity of that activity. Sanctioning cover up activities simultaneously sends two messages to violators: don't cover up as much; but to the extent you still do, cover *that* up more. On the other hand, constraining the productivity of detection avoidance globally discourages the activity. The upshot is this: instead of spending more public funds prosecuting obstruction or perjury, or deciding on procedural sanctions, as seems to be the trend, better to use the same resources to shore up those—albeit less conspicuous—aspects of evidentiary procedure that reduce the cost effectiveness for violators of spending resources to avoid punishment. Better, in particular, to make detection avoidance a more difficult enterprise for violators by further exploiting the limits of their cognitive and cooperative abilities.

XII. Appendix

This appendix reformulates in mathematical terms arguments made in the text.

Model. Let a_i denote spending on detection avoidance of “order” i . Thus, a_1 is spending to avoid detection of the underlying violation, a_2 is spending to avoid detection of activities attendant to a_1 , etc... Let d_i represent public spending devoted to detecting avoidance of order i , incurred in proportion to the extent to which perpetrators engage in order i avoidance.¹⁶¹ The variable d_0 is detection effort directed at the underlying violation.¹⁶² Let s_i be the sanction imposed on detection avoidance of order i . The variable s_0 is the sanction imposed on the underlying violation. We retain three standard assumptions from the neoclassical approach (as described in Part II.A): that offenders are risk neutral; that they are rational; and that there are no false positives in detection.

In a model without detection avoidance the level of deterrence (of the underlying activity) is: $\Delta^0 = p_0(d_0)s_0$, where $p_0(d_0)$ is the probability of detection for the underlying activity, a function of respective detection effort. This expected sanction conditional on committing the violation is what the potential violator weighs against her private gains from the illicit activity in deciding whether to commit the offense.

With detection avoidance added to the model, the level of deterrence for the underlying violation is the violator’s *minimized all-in* expected sanction conditional on commission of the underlying violation, where the violator minimizes this expected sanction by choosing the sequence a_1, a_2, \dots

¹⁶¹ The model can also accommodate “fixed” costs of both detection and detection avoidance.

¹⁶² We could also include a fixed cost component to detection, incurred irrespective of the number of violations. Symmetrically, we could also include a fixed cost component for detection avoidance, incurred regardless of whether a violation is committed.

$$\begin{aligned}
 \Delta = \min_{a_1, a_2, \dots} & \underbrace{p_0 \left(\overset{+}{d}_0; \overset{-}{a}_1, \overset{-}{a}_2, \dots \right)}_{\text{expected sanction for underlying violation}} s_0 \\
 & + \sum_{i=1}^{\infty} \underbrace{a_i}_{\substack{\text{spending} \\ \text{on } i^{\text{th}} \\ \text{order} \\ \text{detection} \\ \text{avoidance}}} + \sum_{i=1}^{\infty} \underbrace{p_i \left(\overset{+}{d}_i, \overset{+}{a}_i; \overset{-}{a}_{i+1}, \overset{-}{a}_{i+2}, \dots \right)}_{\substack{\text{expected sanction for } i^{\text{th}} \text{ order} \\ \text{detection avoidance}}} s_i
 \end{aligned} \tag{1}$$

In this expression $p_i(d_i, a_i; a_{i+1}, a_{i+2}, \dots)$ is the probability of detection for i^{th} order detection avoidance, a function of i^{th} order detection effort, i^{th} order detection avoidance itself, and all higher orders of detection avoidance. Assumed signs of first derivatives are indicated above the respective arguments. Three things are worth noticing about this expression. First, the probability of detection for i^{th} order detection avoidance (including 0^{th} order, the primary activity) is a positive function of detection avoidance of order i and a negative function of detection avoidance of orders $i+1$, $i+2$, etc.... Consider for example, $i = 1$. The more the violator covers up, the more likely that cover up is detected. The more the violator covers up the cover up, however, the less likely that first order cover up is detected. Moreover, detection of *first* order cover up is also rendered less likely, the more the violator engages in *third* order cover up—i.e., covers up the cover up of cover up. This last effect is not emphasized in the text, but is added here for realism. The idea is that higher orders of detection avoidance shore up all lower orders.

Second, no assumption is made here regarding the statistic dependence or independence of detection of detection avoidance of order i relative to detection of detection avoidance of any other order $j \neq i$. The expectation operator is linear, regardless of statistical dependence: i.e., $E[X + Y] = E[X] + E[Y]$ even if X and Y are statistically dependent.

Third, and most importantly, we see in expression (1) the formal manifestation of the three effects of detection avoidance on primary activity deterrence, as described verbally in Part IV.A. First, detection avoidance (of all orders) lowers the probability of detection for the underlying violation. This is signified by the fact that increasing any or all coordinates of the sequence a_1, a_2, \dots reduces p_0 . Second, this reduction is paid for by the violator and that payment adds to the all-in effective sanction: detection avoidance spending a_i directly increases deterrence, as shown in the first summation in (1). Lastly, expected sanctions for detection avoidance (s_1, s_2, \dots) contribute to the all-in effective sanction for the *underlying* violation.

Violators whose private benefits exceed deterrence choose to commit the offense. If private benefits are distributed according to the cumulative distribution F , therefore, $1 - F(\Delta)$ potential offenders choose to commit the offense. Social costs from producing deterrence level Δ are thus:

$$C(\Delta) = \underbrace{(1 - F(\Delta))}_{\text{proportion of offenders}} \left(\sum_{i=1}^{\infty} a_i + \sum_{i=0}^{\infty} d_i + \sum_{i=0}^{\infty} \underbrace{p_i \epsilon_i}_{\text{cost of sanctions}} \right)$$

We see here the formal manifestation of the new social costs borne from adding detection avoidance to the model, as described in Part IV.B. The first sum captures the social waste of detection avoidance. The second, the public cost of detecting not just the primary violation, but also detection avoidance. And the third sum represents the cost of sanctioning not just detected primary violations but also detected detection avoidance activities. Following Becker, the coefficient ϵ is the cost per sanction imposed. To simplify the analysis, assume from hereon that $\epsilon = 0$. Such is the case when the sanction is a fine.

Letting $B(\Delta)$ represent the social benefits of deterrence, the social problem is to choose s_0, s_1, s_2, \dots and d_0, d_1, d_2, \dots to maximize $B(\Delta) - C(\Delta)$. The preliminary, social cost minimization problem that we focus on is choice of the most efficient means of producing any given level of deterrence $\bar{\Delta}$: $\min_{s_i, d_i} C(\bar{\Delta})$: $\Delta = \bar{\Delta}$.

The marginal efficiency of a policy instrument x will be measured by its marginal deterrence cost: its marginal contribution to costs per its marginal contribution to deterrence:

$$MDC_x \equiv \frac{\delta C}{\delta x} / \frac{\delta \Delta}{\delta x}$$

The greater this ratio, the less efficient is instrument x on the margin. At a solution to the social cost minimization problem given $\bar{\Delta}$, the marginal deterrence cost of all instruments positively employed must be equal. Otherwise, the cost of producing deterrence $\bar{\Delta}$ could be decreased by substituting low marginal deterrence cost instruments for high. Roughly speaking, instruments whose marginal deterrence cost tends to be lower (across all levels of their own employment and the employment of other instruments) will tend to be more heavily employed at an optimum. If society is currently not at a social optimum, then the marginal deterrence costs of instruments may not

be equal. In that case, the most efficient way to increase deterrence on the margin is to rely on those instruments with the lowest marginal deterrence costs. Furthermore, holding the level of deterrence constant, such deterrence can be more efficiently provided by substituting low marginal deterrence cost instrument for high.

From (1), we may derive the first order condition for an optimum in the violator's detection avoidance choice problem. We will do so in a way that corresponds to the text discussion of the upside and downside of each order of detection avoidance. (See, e.g., Part VI.A.1.) The (marginal) "sanctions-decreasing upside" of first order detection avoidance is the degree to which it lowers the expected sanction for the primary violation: $-\frac{\partial p_0}{\partial a_1} s_0 > 0$. We will assume that the derivative in this expression is strictly decreasing (in an absolute value sense) in the level of first order detection avoidance. In other words, first order detection avoidance spending has a diminishing marginal impact on the probability of detection for the underlying violation. In fact, we will assume this generally for the impact of higher order detection avoidance on lower order detection probabilities. Against this marginal upside the violator weighs two marginal costs: the direct marginal cost, which is simply one; and the (marginal) "sanctions-increasing downside:" $\frac{\partial p_1}{\partial a_1} s_1 > 0$. We assume that the derivative in this expression is strictly increasing in the level of first order detection avoidance: spending on first order detection avoidance increases the chance of detection thereof at an increasing rate. The violator sets first order detection avoidance at the point where its marginal productivity equals its marginal cost: $-\frac{\partial p_0}{\partial a_1} s_0 = \frac{\partial p_1}{\partial a_1} s_1 + 1$. (If this equation cannot be satisfied, the violator is at a corner solution, $a_1 = 0$.) More generally, the sanctions-reducing upside for detection avoidance of order i is $-\sum_{j=0}^{i-1} \frac{\partial p_j}{\partial a_i} s_j > 0$. The direct cost and sanctions-increasing downside are the same as for first order detection avoidance, and the violator sets: $-\sum_{j=0}^{i-1} \frac{\partial p_j}{\partial a_i} s_j = \frac{\partial p_i}{\partial a_i} s_i + 1$, unless this cannot be satisfied in which case $a_i = 0$.

Sanctioning underlying violations. Suppose for purposes of illustration that detection avoidance is not sanctioned: $s_1 = s_2 = \dots = 0$. In that case, the avoider sets each a_i according to: $-\frac{\partial p_0}{\partial a_i} s_0 = 1$, assuming an interior solution at all orders. Increasing the sanction s_0 for the primary violation raises the sanctions-decreasing upside for first order avoidance as well as avoidance of all higher orders. How does this affect detection avoidance at each order?

To render this difficult problem tractable assume that cross effects across orders of detection avoidance are negligible: $\frac{\delta^2 p_0}{\delta a_i \delta a_j} = 0$, $i \neq j$. (For a discussion of such cross effects see Part V.B.) In this case the equations $-\frac{\delta p_0}{\delta a_i} s_0 = 1$, for $i = 1, 2, \dots$ are independent and for each i the implicit function theorem yields:

$$\frac{\delta a_i}{\delta s_0} = - \left(\frac{\overbrace{\delta p_0}^+}{\delta a_i} / \underbrace{\frac{\delta^2 p_0}{\delta a_i \delta a_i}}_{-} s_0 \right) > 0.$$

Therefore, increasing the primary sanction increases detection avoidance of each order. Raising the sanction raises the marginal sanction-reducing downside of each order of detection avoidance. The violator increases each order of detection avoidance until the marginal upside diminishes back down to the marginal direct cost, 1.

On the other hand, increasing s_0 does increase primary deterrence. Applying the envelope theorem:

$$\frac{\delta \Delta}{\delta s_0} = p_0 + \underbrace{\sum_{i=1}^{\infty} \left(\frac{\delta p_0}{\delta a_i} s_0 + 1 \right)}_{=0} \frac{\delta a_i}{\delta s_0} = p_0 > 0. \quad (2)$$

Notice that the term above the horizontal bracket zeros out even for a_i that are at the corner, $a_i = 0$. Although $\frac{\delta p_0}{\delta a_i} s_0 + 1$ need not be zero at a corner, if it is not, then $\frac{\delta a_i}{\delta s_0}$ will be.

Therefore, increasing the sanction for the primary violation increases deterrence of the primary violation by p_0 , but also increases detection avoidance. Thus, even though the sanction is costless to impose ($c = 0$), the deterrence it generates comes at a social cost, and its marginal cost per deterrence is positive not zero, as in Becker:

$$\frac{\delta C}{\delta s_0} / \frac{\delta \Delta}{\delta s_0} = (1 - F(\bar{\Delta})) \sum_{i=1}^{\infty} \frac{\delta a_i}{\delta s_0} / p_0 > 0.$$

This generalizes Malik's result, as described in Part II.B.

Sanctioning detection avoidance. The effect on higher orders of detection avoidance of imposing a sanction s_1 on first order detection avoidance is similar in form to the effect on all orders of detection avoidance of raising the sanction s_0 on the primary violation. First

order detection avoidance plays the role played by the primary violation. For higher order detection avoidance a_2, a_3, \dots the offender sets: $-\frac{\partial p_0}{\partial a_i} s_0 - \frac{\partial p_1}{\partial a_i} s_1 = 1$. By the implicit function theorem, the effect of raising s_1 is

$$\frac{\delta a_i}{\delta s_1} = - \left(\frac{\overbrace{\frac{\partial p_1}{\partial a_i}}^{+}}{\delta a_i} \bigg/ \underbrace{-\frac{\delta^2 p_1}{\delta a_i \delta a_i} s_1}_{-} \right) > 0, \quad i \geq 2$$

Similarly, raising the sanction on i^{th} order detection avoidance increases detection avoidance at all orders higher than i :

$$\frac{\delta a_{i+k}}{\delta s_i} = - \left(\frac{\overbrace{\frac{\partial p_i}{\partial a_{i+k}}}^{+}}{\delta a_{i+k}} \bigg/ \underbrace{-\frac{\delta^2 p_i}{\delta a_{i+k} \delta a_{i+k}} s_i}_{-} \right) > 0, \quad k \geq 1.$$

The effect on primary deterrence of raising the sanction on i^{th} order detection avoidance is also simplified by the envelope theorem, to p_i . Raising the sanction on i^{th} order detection avoidance (keeping the sanction on lower order detection avoidance fixed) has marginal deterrence cost:

$$\frac{\delta C}{\delta s_i} \bigg/ \frac{\delta \Delta}{\delta s_i} = (1 - F(\bar{\Delta})) \frac{\overbrace{\frac{\delta a_i}{\delta s_i}}^{-} + \sum_{k=1}^{\infty} \overbrace{\frac{\delta a_{i+k}}{\delta s_i}}^{+}}{p_i}.$$

This cost may be positive or negative depending on relative responses at i^{th} and higher orders of detection avoidance.

Sanctioning hierarchies: uniform. Suppose that we impose a uniform sanction s on all orders of detection avoidance and the primary violation. More generally, suppose we raise the uniform sanction from some existing level. An application of the envelope theorem to (1) (using logic similar to that used in deriving (2)) establishes that raising the uniform sanction always increases primary activity deterrence Δ . However, as we will show, it does so at the cost of increasing detection avoidance. Increasing the uniform sanction can only increase those orders of detection avoidance that the violator currently sets at 0. For all orders $i = 1, 2, \dots$ for which the violator is currently exercising positive detection avoidance, the violator is setting:

$$-\sum_{j=0}^{i-1} \frac{\delta p_j}{\delta a_i} s = \frac{\delta p_i}{\delta a_i} s + 1 \Leftrightarrow \left(\underbrace{-\sum_{j=0}^{i-1} \frac{\delta p_j}{\delta a_i}}_{+} - \underbrace{\frac{\delta p_i}{\delta a_i}}_{+} \right) s = 1 \quad (3)$$

The first term in parentheses is order i 's sanctions-reducing upside. The second, its sanctions-increasing downside. To satisfy (3), the net of these two terms must be positive, so that (multiplied by the sanction s) their sum equals the direct marginal cost of i^{th} order detection avoidance. Therefore, increasing s increases the net marginal upside of i^{th} order detection avoidance and thereby increases i^{th} order detection avoidance. Given our assumptions on p_i , this increases a_i . (The parenthesis in (3) is the net marginal benefit of a_i ; if this increases due to a change in s , the violator responds by increasing a_i until the marginal benefit diminishes back down to the fixed marginal cost of 1.) More formally, the implicit function theorem yields:

$$\frac{\delta a_i}{\delta s} = - \frac{\overbrace{\left(-\sum_{j=0}^{i-1} \frac{\delta p_j}{\delta a_i} - \frac{\delta p_i}{\delta a_i} \right)}^{+}}{\underbrace{\left(-\sum_{j=0}^{i-1} \frac{\delta^2 p_j}{\delta a_i \delta a_i} - \frac{\delta^2 p_i}{\delta a_i \delta a_i} \right)}_{-}} s > 0.$$

Sanctioning hierarchies: variable. For sanctions that vary across orders, we have already seen that the envelope theorem implies that increasing the sanction *at any given order* increases primary deterrence. Therefore, an increase in all sanctions, possibly varying in magnitude across orders, increases primary deterrence. What kind variation in increase across orders also reduces detection avoidance spending? Focus on a particular order i . Recall that

$$\sum_{j=0}^{i-1} \underbrace{\left(-\frac{\delta p_j}{\delta a_i} \right)}_{+} s_j - \underbrace{\frac{\delta p_i}{\delta a_i}}_{+} s_i = 1. \quad (4)$$

Our assumptions on p_i imply that the left hand side decreases in a_i . The implicit function theorem, therefore, implies that any change in the sequence s_0, s_1, \dots that increases (decreases) the left side—evaluated at the violator's current choice of a_i —will cause the violator to increase (decrease) a_i . The question, then, is what change in the sequence of sanctions decreases the left side? The condition for decrease is:

$$\sum_{j=0}^{i-1} \underbrace{\left(-\frac{\partial p_j}{\partial a_i} \right)}_+ ds_j - \underbrace{\frac{\partial p_i}{\partial a_i}}_+ ds_i < 0 \quad (5)$$

Combining (5) with the first order condition (4) we have:

$$\frac{\sum_{j=0}^{i-1} \left(-\frac{\partial p_j}{\partial a_i} \right) ds_j}{\sum_{j=0}^{i-1} \left(-\frac{\partial p_j}{\partial a_i} \right) s_j} < \frac{ds_i}{s_i} \Leftrightarrow \sum_{j=0}^{i-1} a_j \frac{ds_j}{s_j} < \frac{ds_i}{s_i}, \text{ where } a_j = \frac{\left(-\frac{\partial p_j}{\partial a_i} s_j \right)}{\sum_{j=0}^{i-1} \left(-\frac{\partial p_j}{\partial a_i} \right) s_j}. \quad (6)$$

In words, a necessary condition for i^{th} order detection avoidance to decrease is that the percentage change in s_i exceed the (weighted) average percentage change in lower order s_j . (In the case in which a_i affects only p_{i-1} , (6) reduces to $\frac{ds_{i-1}}{s_{i-1}} < \frac{ds_i}{s_i}$.) Thus, if we are increasing all lower order sanctions by 10%, the sanction at order i must be increased by more than 10%. This continues to be so even after the base for the higher sanction has grown much larger than that for lower order sanctions.

Conversely, increasing the higher order sanction by a *lower* proportion than the lower causes the left side of (4) to increase even more than it would were all sanctions increased by the same proportion, as in the uniform sanction case examined above.

Technological attack. Setting sanctions for all orders of detection avoidance equal to zero, focus on the effect of d_0 on $p_0(d_0, a_1, a_2, \dots)$. For purposes of this analysis, we may combine detection avoidance into one variable a and we may drop all “0” subscripts. The violator sets $-\frac{\partial p}{\partial a}(d, a)s = 1$. An intensification of the technological attack is an increase in the parameter d that: 1) reduces the marginal productivity of detection avoidance, i.e., $-\frac{\partial^2 p}{\partial a \partial d}(d, a) < 0$, and 2) does not increase the probability of detection in the absence of detection avoidance, i.e., $\frac{\partial p}{\partial d}(0, d) \geq 0$. In that case

$$\frac{\delta a}{\delta d} = - \frac{\overbrace{\frac{\partial^2 p}{\partial a \partial d}(d, a)}}{-} \bigg/ \underbrace{-\frac{\partial^2 p}{\partial a \partial a}(d, a)}_{-} s < 0,$$

so that detection avoidance spending decreases. For the effect on

deterrence, first note that $\frac{\partial p}{\partial d}(a, d) = \int_0^a \overbrace{\frac{\partial^2 p}{\partial a \partial d}(a, d)}^+ + \overbrace{\frac{\partial p}{\partial d}(0, d)}^+ > 0$.

Therefore, raising d increases deterrence: $\frac{\delta\Delta}{\delta d} = \overbrace{\frac{\partial p}{\partial d}}^+ s > 0$. The marginal deterrence cost of d becomes:

$$\frac{\delta C}{\delta d} / \frac{\delta\Delta}{\delta d} = (1 - F(\bar{\Delta})) \left(1 + \overbrace{\frac{\partial a}{\partial d}}^- \right) / \overbrace{\frac{\partial p}{\partial d}}^+ s.$$

Increasing d is more cost effective the more doing so reduces the productivity of detection avoidance. Indeed, it is even possible that increasing d will produce more deterrence at lower social cost. Such is the case if $\delta a / \delta d < -1$.

Reducing the marginal productivity of detection avoidance is not the same as increasing the marginal cost of probability reductions. This is an important distinction because a marginal cost increase does not necessarily lead to a reduction in detection avoidance spending: although the violator “buys” fewer probability points, each costs more.

Given $p_a < 0$ and $p_{aa} > 0$, a marginal productivity reduction implies, but is not implied by a marginal cost increase. Marginal cost is $-\frac{\partial a}{\partial p}(p, d) = \left(-p_a(p^{-1}(p, d), d) \right)^{-1}$. This increases in d if and only if $-p_a(p^{-1}(p, d), d)$ decreases in d . Taking the derivative of this expression yields

$$\frac{-\partial p_a(p^{-1}(p, d), d)}{\partial d} = -\overbrace{\frac{\partial^2 p}{\partial a \partial d}}^+ \overbrace{\frac{\partial a}{\partial d}}^+ (p, d) - \frac{\partial^2 p}{\partial a \partial d},$$

where $p_a < 0$ and $\frac{\partial p}{\partial d} > 0$ (derived above) implies $\frac{\partial a}{\partial d} > 0$. Therefore, $\frac{\partial^2 p}{\partial a \partial d} > 0$ is sufficient for increasing marginal cost, but marginal cost can decrease even if $\frac{\partial^2 p}{\partial a \partial d} < 0$. For a specific example of the latter possibility, consider $p(a, d) = e^{-a/d} \Leftrightarrow a(p, d) = -d \ln p$, wherein $-a_{pd} = \frac{1}{p} > 0$, so that marginal cost increases in d , but $-p_{ad} = \frac{p}{d^2} \left(\frac{a}{d} - 1 \right)$, so that marginal productivity goes down in d only for low a .