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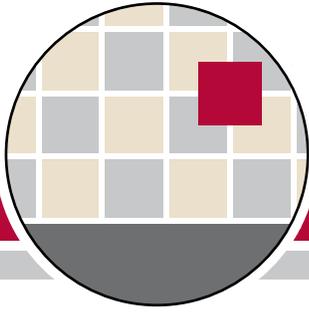
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The Criminalization of the Theft of Trade Secrets: An Analysis of the Economic Espionage Act

Nicola Searle*

Introduction

One of the most famous trade secrets in the world, the secret Coca-Cola formula, has long been a subject of fascination. Tales of this century-long, highly maintained secret have become part of the company's folklore.¹ However, Coca-Cola's secrecy was tested in 2006 when Joya Williams and her two partners attempted to sell Coke secrets to its main rival, Pepsi, for \$1.5 million.² Pepsi turned these unmasked offenders over to the authorities and Williams was subsequently sentenced to eight years in prison.³

The law that led to Williams's incarceration is the Economic Espionage Act of 1996 (EEA). Amid concerns over the vulnerability of American trade secrets, the United States enacted the EEA in 1996. Prior to the EEA, the theft of trade secrets was, by itself, not a crime. Using data from EEA prosecutions, this essay provides institutional detail and policy analysis of the EEA. It begins with a short history of the legislation, presents the theoretical underpinnings for trade secrecy protection progresses to a statistical analysis of the composition of EEA cases and concludes with a statistical and theoretical examination of the criminalization of trade secrets.

This essay presents a law and economics assessment of how the elevation of the theft of trade secrets from civil malfeasance to a felony affects the incentives for both firms and potential thieves. The essay begins with a theoretical analysis of the EEA and concludes with an empirical assessment of prosecutions under the EEA. In comparison to penalties used in civil cases, the new incentive of a criminal deterrent to trade secret theft introduces severe consequences, such as incarceration as a form

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1. For a discussion on the Coke folklore, see Barbara Mikkelson, *Have a Cloak and a Smile*, SNOPEs.COM, <http://www.snopes.com/cokelore/formula.asp> (last updated June 4, 2011).

2. *3 Arrested in Coca-Cola Trade Secret Scheme*, CNN.COM (July 5, 2006), http://money.cnn.com/2006/07/05/news/companies/coke_pepsi/.

3. *United States v. Williams*, 526 F.3d 1312 (11th Cir. 2008).

of punishment.⁴ Additionally, the criminalization of trade secrets plays into the property versus liability debate.⁵ When confronted with a theft of trade secrets, a firm must decide whether to seek legal recourse and, if so, whether recourse should be criminal and/or civil.⁶ However, the financial damages assessed in EEA criminal cases can be compared to civil cases, and are found to be lower.⁷

The Economic Espionage Act (EEA) of 1996

Amid reports of the theft⁸ of American trade secrets by foreigners, the United States enacted the EEA⁹ in 1996. The act marked a significant change in the legal approach to trade secrets by increasing the category of the theft of trade secrets to a felony, broadening the definition of trade secrets and including extraterritorial jurisdiction. While most American states had passed the Uniform Trade Secrets Act (UTSA),¹⁰ the EEA harmonized trade secret law across the country. This new harmonization makes it possible to examine trade secrets thoroughly in a consistent manner across all states.

The EEA was enacted under the presidency of Bill Clinton and coincided with a time of economic prosperity in the United States. It was, as Carr and Gorman note,¹¹ drafted in a post-Cold War era during which time the United States enjoyed a relatively militarily peaceful time. Given these circumstances, many authors¹² argue the closing down of the market for political and military spies meant these spies adapted their trade to industrial espionage. The concept that former spies were now engaging in economic espionage was of great interest to U.S. politicians and businesses.¹³ According to Fialka, a series of incidents involving French businessmen and spy allegations in the early 1990s caught the attention of the U.S. intelligence agencies.¹⁴ Acquisitions of American assets by Chinese and Japanese entities alarmed American businesses.¹⁵ At the same time, the economy was in the process of shifting to an ever more information based, digital platform which both increased the bulk of potentially valuable information and exposed that information to the

4. Chris Carr, Jack Morton & Jerry Furniss, *The Economic Espionage Act: Bear Trap or Mouse Trap?*, 8 TEX. INTEL. PROP. L.J. 159 (2000).

5. See *infra* notes 42-57 and accompanying text.

6. KEITH HODKINSON & MARTIN WASIK, *INDUSTRIAL ESPIONAGE PROTECTION AND REMEDIES* (1986).

7. Josh Lerner, *Using Litigation to Understand Trade Secrets: A Preliminary Exploration* (Aug. 2006), available at <http://ssrn.com/abstract=922520>.

8. See JOHN J. FIALKA, *WAR BY OTHER MEANS: ECONOMIC ESPIONAGE IN AMERICA* (1997).

9. 18 U.S.C. §§ 1831-1839 (2006).

10. Robbin J. Effron, Note, *Secrets and Spies: Extraterritorial Applications of the Economic Espionage Act and the TRIPS Agreement*, 78 N.Y.U. L. REV. 1475, 1485 (2003).

11. Chris Carr & Larry Gorman, *The Revictimization of Companies by the Stock Market Who Report Trade Secret Theft Under the Economic Espionage Act*, 57 BUS. LAW. 25, 25-33 (2001).

12. Carr et al., *supra* note 4; Carr & Gorman, *supra* note 11; HEDEIH NASHERI, *ECONOMIC ESPIONAGE AND INDUSTRIAL SPYING* (2005).

13. FIALKA, *supra* note 8; Effron, *supra* note 10.

14. FIALKA, *supra* note 8, at 87-112.

15. *Id.* at 41-65.

inherent insecurity (e.g., its easily replicable nature) of the digital world.¹⁶ These political and economic shifts drew to public attention the potential threat of economic espionage and the vulnerability of trade secrets to theft.

Prior to the EEA, the theft of trade secrets was dealt with primarily via civil actions and related criminal charges.¹⁷ In two provisions, sections 1831 and 1832, the EEA elevated economic espionage and the theft of trade secrets to a felony. Section 1831, Economic Espionage, makes the theft of trade secrets to benefit a foreign agent a criminal act punishable by up to 15 years imprisonment and \$500,000 for individuals and up to \$10 million fine for corporations. Section 1832, Theft of Trade Secrets, makes theft of, attempted theft of, or conspiracy to steal trade secrets a crime. In this case, the individual can be fined up to \$250,000 and imprisoned for up to 10 years, while corporations are subject to fines up to \$5 million.

Two elements of the act have been controversial: the extension of the definition of trade secrets and the potential extraterritorial application of the act. Effron (2003) notes the EEA's broader definition of trade secrets in comparison to the previous UTSA standard:

To the UTSA's "formula, pattern, compilation, program, device, method, technique, or process," the EEA adds "plans, . . . program devices, . . . designs, prototypes, . . . techniques, . . . procedures, . . . or codes" and expressly protects "financial, business, scientific, technical, economic, or engineering information."¹⁸

This extension to named types of information broadens the overall definition of trade secrets. In addition, the concept of "public" as a test for secrecy is somewhat obfuscated in the EEA, which merely states, "from not being generally known to . . . the public",¹⁹ which leaves considerable room for interpretation of who the public entails. This has been a point of debate in EEA cases.²⁰

In addition, the act has extraterritorial applications in Section 1837, Applicability to Conduct Outside the United States, which extends the prosecution of economic espionage and the theft of trade secrets to specific conduct occurring outside the United States. This extraterritorial reach²¹ may force companies with U.S. links to enact protection schemes for the trade secrets, or alter their behavior in ways that they would have done prior to the EEA.²² At least one

16. Carr & Gorman, *supra* note 11.

17. *Id.*

18. Effron, *supra* note 10, at 1487.

19. 18 U.S.C. §1839(3)(B).

20. For an example, see the appeal documents in *United States v. Lange*, 312 F.3d 263 (7th Cir. 2002).

21. To mitigate the controversy regarding the extraterritorial reach, the Attorney General (Janet Reno at the time) required the first five years of prosecutions be subject to express approval of the office of the attorney general. Craig L. Uhrich, *The Economic Espionage Act—Reverse Engineering and Intellectual Property Public Policy*, 7 MICH TELECOMM. & TECH. L. REV. 147 (2001).

22. See Effron, *supra* note 10.

case has involved conduct outside the United States. In *United States v. Cartwright*,²³ two of the individual defendants were U.S. citizens living abroad in Prague and receiving stolen information to benefit two foreign corporations from their U.S.-based counterpart in Maryland. However, in cases involving foreign nationals, other countries may not be willing to extradite suspects.²⁴ This was the case with *United States v. Okamoto*²⁵ in which Japan refused the U.S. extradition request.²⁶ These two cases are the only two EEA prosecutions that appear to involve the extraterritorial application and the question of extradition.

Justifications for Trade Secrecy

The theoretical underpinnings of Intellectual Property Rights develop rationales for the creation of these property rights. Two prominent theories can be found in the writings of John Locke (1690) and Adam Smith (1776).²⁷ Locke provides a theoretical justification for property rights applying the concept of labor theory of acquisition.^{28, 29} Locke argues that individuals have ownership of their own labor and, when that labor is applied to remove something out of its natural state, the result is also his property. Smith argues for property rights as a means to avoid the tragedy of the commons.³⁰ IP protection systems provide a policy tool to maintain the delicate balance of the individual's property rights and the utilitarian perspective of social surplus.

Further justifications can be found in the social contract theory of IP in which law is a contract between the state (society) and innovators. As Denicolo and Franzoni note, contract theory argues the goal of IP is to “promote the diffusion of innovative knowledge.”³¹ Under the patent system, the individual reveals the innovation and is granted protection from appropriation, in the form of a temporary monopoly, which then results

23. *United States v. Cartwright*, No. 1:07-cr-00570-WMN (D. Md., filed Jan. 7, 2008), *indictment available at* <http://www.justice.gov/atr/cases/f229900/229954.pdf>.

24. NASHERI, *supra* note 12.

25. *United States v. Okamoto*, No. 1:01-cr-00210-DDD-1 (N.D. Ohio, filed May 8, 2001); Press Release, U.S. Dep't of Justice, *First Foreign Economic Espionage Indictment; Defendants Steal Trade Secrets from Cleveland Clinic Foundation* (May 8, 2001), *available at* http://www.cybercrime.gov/Okamoto_SerizawaIndict.htm.

26. Natalie Obiko Pearson, March 29, 2004, *Tokyo Rejects Extradition of Alleged Spy*, ASSOCIATED PRESS, March 29, 2004, *available at* http://www.economicespionage.com/tokyo_rejects_extradition_of_all.htm.

27. JOHN LOCKE, *Second Treatise of Government*, in *TWO TREATISES OF GOVERNMENT* (Peter Laslett ed. Cambridge Univ. Press 1988) (1690); ADAM SMITH, *AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS* (Andrew Skinner ed., Penguin Classics 1999) (1776).

28. Gary Becker labels Locke's theory as “labor theory of acquisition.” Gary S. Becker, *The Economics of Crime*, 76 J. POL. ECON. 169 (1968). Other authors refer to Locke's theory as labor-deserve theory, e.g., Maurizio Borghi, *Owning Form, Sharing Content: Natural-Right Copyright and Digital Environment*, in *5 NEW DIRECTIONS IN COPYRIGHT LAW* 197 (Fiona McMillan ed., 2007), or merely labor theory.

29. Texts and notes selected by Maurizio Borghi, *Rationales for Patent Protection*, Bocconi Intellectual Property Transatlantic Summer Academy, June 25, 2007.

30. SMITH, *supra* note 27.

31. Vincenzo Denicolò & Luigi A. Franzoni, 23 INT'L REV. L. & ECON. 365, 365 (2004).

in higher prices and lower quantities of the good. In return, society benefits from the innovation and receives the innovative knowledge in exchange for paying higher prices.

The justification for Trade Secret protection is more problematic than that of patents and copyrights. From the Lockean perspective, trade secrecy is compatible with labor theory of acquisition. Robert Bone, however, notes while the Lockean deserve-deserve theory does allow for some rights over the fruits of labor, it says nothing about the need for secrecy.³² Furthermore, from the utilitarian perspective, trade secrecy does not necessarily have the social surplus aspects required. As Edwin Hettinger notes, trade secrecy does not encourage the free flow of information and can limit the labor mobility of employees.³³ These difficulties in justifying trade secrets highlight some of the doubts raised by legal scholars with respect to trade secrets as a form of IP.³⁴

However, from a practical perspective, these arguments are partially addressed by the relatively low level of protection afforded to trade secrecy in comparison with other intellectual property.³⁵ In addition, like patents, trade secrecy offers incentives to innovate and develop ideas. In response to Hettinger's arguments, Lynn Paine argues trade secrecy is justified on the basis that individuals should have the right to control initial disclosure of their ideas, respect for confidential relationships and that patents, by offering incentives to disclose, implicitly recognize the right of innovators not to disclose.³⁶

Further justification for trade secrecy can be found in the analysis of privacy law. While privacy law focuses on privacy as it pertains to individuals, the extension of privacy to commercial activities provides further arguments in favor of trade secrecy. Richard Posner addresses the relationship between privacy, which he defines as "the withholding or concealment of information,"³⁷ and secrecy, which is included in the broader definition of privacy. Posner argues secrecy allows the innovator to choose when to disclose information. Posner argues privacy, and therefore secrecy, is sound in an economic sense in the commercial context because it reduces socially wasteful efforts to protect information.

The combination of labor, utilitarian, and privacy theories provides the main justifications for Intellectual Property protection. These arguments are typically applied to the justification of patents, but similar arguments can be made in favor of trade secrecy.

32. Robert G. Bone, *A New Look at Trade Secret Law: Doctrine in Search of Justification*, 86 CAL. L. REV. 241 (1998). Bone notes the Lockean argument cannot "explain two of the most basic features of trade secret law: its requirement of secrecy, and its concern with the way information is appropriated." *Id.* at 284.

33. Edwin Hettinger, *Justifying Intellectual Property*, 18 PHIL. & PUB. AFF. 31 (1989). The labor mobility of employees can be hindered by non-compete or non-disclosure clauses in employment contracts that limit employee's ability to work for other employers. This also falls under the "inevitable disclosure" doctrine.

34. Mark A. Lemley, *The Surprising Virtues of Treating Trade Secrets as IP Rights*, 61 STAN. L. REV. 311 (2008).

35. David D. Friedman, William M. Landes & Richard A. Posner, *Some Economics of Trade Secret Law*, 5 J. ECON. PERSP. 61 (1991); Lemley, *supra* note 34.

36. Lynn Sharp Paine, *Trade Secrets and the Justification of Intellectual Property: A Comment on Hettinger*, 20 PHIL. & PUB. AFF. 247 (1991).

37. RICHARD A. POSNER, *THE ECONOMICS OF JUSTICE* 231 (1983).

Trade Secret Law Harmonization

The international harmonization of trade secrecy laws is also an issue as differing legal approaches towards trade secrets pose problems for international business.³⁸ In contrast to patents, trade secrecy has relatively more heterogeneous protection internationally and may fall under a variety of legal jurisdictions (e.g., tort law, criminal law, and contract law).³⁹ This lack of consistency obfuscates the legal protection of trade secrets, particularly for firms operating in multiple countries. The public status of court proceedings can also have an impact on the protection of trade secrets, as firms will be reluctant to seek legal recourse if court proceedings are made public.⁴⁰ Furthermore, prior user rights are not internationally harmonized.⁴¹ Given the discordance of international IP regimes, harmonization of trade secret laws internationally could prove beneficial to firms operating internationally.

The Property Liability Debate

This section introduces the property liability debate with respect to trade secrets and applies the analytical structure of optional law.⁴² As noted earlier, the legal protection of trade secrets prior to the EEA rested primarily in tort and contract law. As such, trade secrets are an entitlement protected by liability⁴³ as opposed to other IP, such as patents, which are protected by property rules.⁴⁴ The EEA, in the criminalization of theft of trade secrets, continues with the protection of trade secrets under liability rules. The economic efficiency of the decision to protect entitlements through property or liability rules is an ongoing debate and merits discussion in its context with the EEA.

Calabresi and Melamed set up the property-liability rule.⁴⁵ Consider the owner of a land and neighbor who wishes to pollute and damage the land. If the property entitlement lies with the owner, the neighbor can only pollute with the owner's permission as the owner has the right to request a court injunction. If the property entitlement lies with the neighbor, the neighbor has the right to pollute. In these cases, the entitlement can result in an enjoinder of the nuisance (pollution) or does not recognize a nuisance. However, under the liability rules, the situation is

38. Bone, *supra* note 32; Lemley, *supra* note 34.

39. Bone, *supra* note 32; Pamela Samuelson & Suzanne Scotchmer, *The Law and Economics of Reverse Engineering*, 111 YALE L.J. 1575 (2002).

40. NASHERI, *supra* note 12.

41. See Peter S. Menell & Suzanne Scotchmer, *Intellectual Property*, in HANDBOOK OF LAW AND ECONOMICS (Mitch Polinsky & Steven Shavell eds., 2007).

42. Optional law takes real options analysis and applies it to law.

43. Liability rules protect entitlements by compensating the entitlement holder in the event of a non-consensual taking. IAN AYRES, *OPTIONAL LAW: THE STRUCTURE OF LEGAL ENTITLEMENTS* (2005).

44. Property rules protect the holder of the entitlement by deterring non-consensual takings. *Id.*

45. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972).

different. Assuming entitlement lies with the owner, the neighbor can pollute but must compensate the owner.⁴⁶ In this case, the rules allow for damages⁴⁷ and the nuisance to continue.

Calabresi and Melamed argue entitlements promote economic efficiency in that they minimize the administrative costs of enforcement, promote pareto optimality and can address society's distributional goals. Furthermore, the authors argue liability rules are enacted when transactions costs are too high. This argument, as in Ayres, has become standard delineating theory of the decision to use property or liability rules.⁴⁸ A similar argument, also in Ayres, is the "Posnerian theory" which argues that where transactions costs are not too high, property rules are favored as they "force" parties to negotiate.⁴⁹

When applied to IP, the use of property rights should reduce transactions costs. As Merges argues, "property rules can and do work effectively in many situations involving IPRs. This is so because, in the presence of high transaction costs, industry participants have an incentive to invest in institutions that lower the costs of IPR exchange."⁵⁰ This argument can justify the property protection of patents. However, Blair and Cotter argue trade secrets should have different protection than patents due to the unique characteristics of trade secrets including the lack of disclosure and the right of competitors' to reverse engineer.⁵¹

Furthermore, the application of the property–liability debate when applied to the EEA is not straightforward because the use of a property rule to protect trade secrets is problematic. The conversion of the trade secrecy entitlement into a property rule would imply the use of a trade secret could be enjoined. In practice, while the court could issue injunctions with respect to stolen trade secrets, the theft itself can destroy the secrecy of the trade secret itself. The value of the entitlement is destroyed by the theft. Furthermore, Blair and Cotter acknowledge "a trade secret owner's rights are not valid against the world, but rather only against persons who have acquired the secret in certain ways or who stand in a confidential relationship to the owner."⁵² Epstein concludes the case for the treatment of trade secrets as property from a legal perspective "remains a mess."⁵³

46. Calabresi and Melamed also discuss the case in which, under the liability rule, the entitlement lies with the neighbor, but note this is not common. *Id.* at 1120.

47. Liability rules in criminal sanctions serve to approximate the value (damages) of the entitlement to its owner. Further discussion of criminal prosecution under the property law can be found in Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules*, 109 HARV. L. REV. 713 (1996).

48. See AYRES, *supra* note 43, at 143.

49. *Id.*

50. Robert P. Merges, *Of Property Rules, Coase, and Intellectual Property*, 94 COLUM. L. REV. 2655, 2655 (1994).

51. Roger D. Blair & Thomas F. Cotter, *Strict Liability Rules and its Alternatives in Patent Law*, 17 BERKELEY TECH. L.J. 799 (2002).

52. *Id.* at 811 n.31.

53. Richard A. Epstein, *The Constitutional Protection of Trade Secrets Under the Takings Clause*, 71 U. CHI. L. REV. 57, 72 (2004).

Hence, the theoretical application of property rules to the entitlement of trade secrets does not fit the Calabresi and Melamed definition of property rules. Thus, the use of a variant of the liability under the EEA is in line with the unique characteristics of trade secrets, which, as discussed earlier, do not involve the public disclosure associated with patents.

Options Analysis of the Law

Ayres applies the real options theory of economics to that of law to argue property rules are a special case of liability rules. Using the put/call framework of options theory, Ayres describes liability rules as a call option in which the entitlement is taken non-consensually and the owner is paid damages.⁵⁴ He describes property rules as having a call option (damages) so high it deters non-consensual taking. In this sense, Ayres argues, “property rules are liability rules with an exercise price so high that the option is (almost) never taken.”⁵⁵

Ayres notes the legal trend in the U.S. is the increasing “proptertization of intellectual entitlements”⁵⁶ in the form of IP. However, despite the trend to strengthening the property status of IP, the options theory framework of Ayres argues the property protection for IP is a variant of the liability rule.

In his analysis of the debate between property and liability rules, he criticizes Calabresi and Melamed’s argument that liability rules are preferred when transactions costs are high. As Ayres argues, the transactions cost argument neglects to address the fact that bargaining can happen in the shadow of liability and property rules. Additionally, Ayres argues options theory can show liability rules can dominate property rules in economic efficiency terms.

However, Ayres does not solve the liability versus property rules debate. As he notes, “The stark truth is that despite the empirical prevalence of property (and indeed the headlong rush toward the extreme proptertization of intellectual property), no one has to date produced a satisfying algebraic model in which property rules dominate liability rules.”⁵⁷ Thus, in the liability–property rule debate, the property status of other IP may raise more questions than it does answers.

Overall, the examination of the property–liability rule debate in the context of the EEA further underscores the structural differences between trade secrets and patents and furthers the analysis of the criminal treatment of the theft of trade secrets.

54. This application of options theory is in line with Scotchmer’s observation of the circular relationship between damages and royalty rates in which the potential infringer can seek to negotiate royalty rates or exercise a call option in the form of infringement and the subsequent payment of damages. *See* SUZANNE SCOTCHMER, *INNOVATION AND INCENTIVES* (2005).

55. AYRES, *supra* note 43, at 5.

56. *Id.* at 185.

57. *Id.* at 199.

Law and Economics Analysis of Tort and Criminal Law

Further analysis of the decision to convert the theft of trade secrets into a felony can be found in the law and economics literature. Dnes notes criminalization of activity differs from civil action on three points: the standard of proof, mens rea (intent) and the element of public harm (i.e. the public is harmed by such actions).⁵⁸ Furthermore, Dnes argues, “in tort, we tend to know when the accident or nuisance has occurred” while in criminal action, we may not. Thus, a prime role of the punishment in criminal cases is as a deterrent effect. This has important implications for the economic efficiency of the criminalization of trade secrets.

When applied to the theft of trade secrets, many of Dnes’ elements of criminal law are met.⁵⁹ Certainly, the standard of proof in EEA cases should be higher than parallel civil actions. However, the issue of intent may not be as straightforward. For this element to be met, the defendant would have to know that the trade secret they were stealing was, in fact, a protected trade secret. Furthermore, it may be, as in the case of DirectTV,⁶⁰ the defendant intended to do harm but without a financial motive. Given the EEA is primarily concerned with the economic effects of trade secret theft, this lack of financial benefit raises concerns about the efficiency of using criminal actions to prosecute a previously civil nuisance.

The element of public harm in EEA cases is indirect. As trade secrets are privately held information, then the individual cases of theft are, by definition, private. However, the general deterrence effect of the EEA criminal sanctions should serve to benefit privately held information in general. If criminals are deterred by the EEA, then the owners of trade secrets can incur less wasteful avoidance expenditures to protect trade secrets. Thus, the public indirectly benefits from a more secure IP environment. Dnes puts this succinctly: “sufficient penalties create deterrence, which removes the need for wasteful avoidance by potential victims.”⁶¹ In deterring the theft of trade secrets, a wasteful crime that benefits the few, in that costs incurred by the many owners of trade secrets in the form of wasteful avoidance are reduced. Thus, the deterrence effects of the EEA increases economic efficiency by decreasing the costs associated with protecting trade secrets.

However, Dnes is critical of the use of criminal law to protect torts he deems that in some cases it is “staggeringly inappropriate.”⁶² He cites the example of the BBC license fee in the UK. The possession of a television without a license is subject to criminal sanctions in the form of fines. In this case, Dnes concludes, “the state is using its coercive power simply to reduce the cost of pursuing those taking BBC services, offered to all, and subsequently failing

58. Anthony Dnes, *Criminal Law and Torts*, in CRIMINAL LAW AND ECONOMICS (Nuno Garoupa ed., 2009).

59. *Id.*

60. United States v. Serebryany, No. 2:03-cr-00042-LGB (C.D. Cal., filed Jan. 16, 2003).

61. Dnes, *supra* note 58, at 112 (citing WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF TORT LAW (1987)).

62. *Id.* at 120.

to pay for them.”⁶³ However, this example differs from the EEA in that, unlike the BBC monitoring of licenses, in which the BBC has a legal right to issue and monitor licenses,⁶⁴ the reporting of EEA thefts is a voluntary action on the part of the victim. Nonetheless, both cases involve criminal sanctions to support the business models of corporations.

Dnes further examines the delineation of criminal and tort law, and the use of criminal law in place of civil law, in a pollution example. In this case, the use of criminal law allows the coercive power of the state to “encourage desirable behavior.”⁶⁵ In this case, under tort law, a polluter will prefer to pay fines when the marginal cost of abatement of pollution is higher than that of the fine. However, Dnes argues criminal fines are equivalent to a strict-liability tort⁶⁶ and fines are paid on all pollution above the minimal level. As Dnes points out, fines are always paid under the criminal law, whether or not the polluter abates. This, as Dnes argues, more efficiently discourages pollution.

An extension of this pollution example can be found in the EEA. The criminal prosecution of trade secrets could interact with the reverse engineering exception to trade secrecy. That is, the costs of reverse engineering could be considered abatement costs. Where reverse engineering is more expensive than fines, firms will choose to steal. In tort and contract law, the damages calculation (fine) can function as a compulsory license.⁶⁷ Under criminal action, theft is subject to fines and/or incarceration. When reverse engineering is cheaper than fines, firms will reverse engineer. By increasing the punishment associated with theft, the EEA indirectly encourages reverse engineering. Samuelson and Scotchmer argue reverse engineering is important to innovation and competition and, thus, the EEA can be an important policy tool with respect to reverse engineering.⁶⁸ Hence, the EEA promotes economic efficiency by encouraging innovation, which is seen as a social benefit.

However, a normative conclusion on the decision to criminalize the theft of trade secrets is beyond the scope of this essay. While the EEA should improve economic efficiency in the reduction of avoidance costs and the benefits from innovation, the overall optimality of the criminalization of the theft of trade secrets is not certain. The analysis here suggest the EEA increases economic efficiency by decreasing costs via improved deterrence and increasing

63. *Id.*

64. For details, see *TV Licensing—FOI: Legal framework*, TVLICENSING.CO.UK, <http://www.tvlicensing.co.uk/about/foi-legal-framework-AB16/>

65. Dnes, *supra* note 58, at 121.

66. Liability which is independent of culpability.

67. As Dan Burk notes, “Courts have in a very few instances denied injunctive relief to patent holders in favor of monetary damages, effectively creating a compulsory license for that patent, at a royalty determined by the court.” Dan L. Burk, *Critical Analysis of Property Rules, Liability Rules, and Molecular Futures: Bargaining in the Shadow of the Cathedral*, in *GENE PATENTS AND COLLABORATIVE LICENSING MODELS: PATENT POOLS, CLEARINGHOUSES, OPEN SOURCE MODELS AND LIABILITY REGIMES* (Geertrui Van Overwalle ed., 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1359216.

68. Samuelson & Scotchmer, *supra* note 39. However, as Samuelson and Scotchmer point out, the legal status of reverse engineering under the EEA is unclear. *See id.*

social benefits by encouraging innovation. Further empirical investigations on the effects of the EEA should shed more light on this fact. Whether the EEA's criminalization of the theft of trade secrets is entirely inappropriate remains to be seen.

Empirical Analysis of the EEA

To move from theoretical analysis to the empirical investigations of the EEA, we turn to the EEA prosecution data. During the period covered by this essay (1996-2008), there were 147 defendants in 95 cases involving the EEA. For this research, these cases have been identified using the Public Access to Court Electronic Records (PACER) system. Once identified, each case was then investigated via docket reports, court documents, and online media coverage. Further information was gathered from academic essays related to the EEA.⁶⁹ Depending on the court, official documents are only available from more recent cases; in some courts, the documents are only available for cases since 2004. For a minority of cases, little to no information on the victim company and stolen information was available. The information gathered in this prosecution data represents a unique look into the use of trade secrets, their theft, and the policy choices available to governments.

Data Challenges

The use of prosecution data faces a number of challenges and the EEA data are no exception. The primary obstacle is that of adverse selection. Prosecutors select cases based on the severity of the crime and the likelihood of successful prosecution. Prosecutors are also more likely to seek prosecution in cases where the evidence is strong and a conviction is likely as the burden of proof in criminal cases has a "tougher criterion than in one used in civil disputes."⁷⁰ Furthermore, victims must first report the alleged crime to the FBI via an official document reporting the offense.⁷¹ As Nasheri notes, "Probably the greatest reason why trade secret theft is not prosecuted more often is the failure of victim companies to report such thefts to government authorities."⁷²

The cumulative effect of these challenges to the use of prosecution data is that conclusions arising from the data are tempered by the inherent sample bias. Despite this, it is important to remember that, given the nature of trade secrets, very little empirical data are available on their use. Economists have long used evidence from litigation to investigate the use of patents and their economic importance.⁷³ The use of

69. Particularly Effron, *supra* note 10; Carr et al., *supra* note 4; Carr & Gorman, *supra* note 11; Marc J. Zwillinger & Christian S. Genetski, *Calculating Loss Under the Economic Espionage Act of 1996*, 9 GEO. MASON L. REV. 323 (2000); NASHERI, *supra* note 12.

70. Dnes, *supra* note 58; ANTHONY W. DNES, *THE ECONOMICS OF LAW* (1996); *see also* ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* (4th ed. 2004).

71. Via their local FBI office, reporting form is "Checklist for Reporting Theft of Trade Secret Offense", available from <http://www.usdoj.gov/criminal/cybercrime/reportingchecklist-ts.pdf>

72. NASHERI, *supra* note 12, at 52

73. *E.g.*, SCOTCHMER, *supra* note 54.

patent litigation evidence can be found in Lanjouw and Schankerman,⁷⁴ Schankerman and Scotchmer,⁷⁵ and Jaffe and Lerner.⁷⁶ As such, the EEA prosecution data are a legitimate means of analysis and offer a glimpse into the unseen world of trade secrets. The empirical analysis of EEA data developed throughout this essay furthers the understanding of the strategic use of trade secrets as a means of protecting innovation and builds on the similar existing litigation studies in patents. This essay joins Zwillinger and Genetski,⁷⁷ Lerner⁷⁸ and Almeling et al.⁷⁹ in the use of court data to understand trade secrets.

Composition of Defendants, Victims and Trade Secrets in EEA Cases

Defendants

From its inception in 1996 through to 2008, 147 defendants were charged under the EEA. Given the economic espionage concerns that surrounded the birth of the EEA, the composition of the defendants themselves provides insight into the relevance of the drafters' concerns.

The data indicate the threat of theft is not external but predominately internal. As shown in the last row of Table 1, the EEA data demonstrate 76% of the defendants are insiders, 17% are outsiders and 7% have an unknown relationship. An "insider" is defined as a current or former employee, which includes permanent and temporary employees and consultants or workers performing contracted-out work (for a third party company). In contrast, only 25 defendants were classified as outsiders, which include competitors, non-employees, or other roles that do not provide legitimate access.

While the fact insiders are disproportionately responsible for theft in EEA cases should come as no surprise, as stated in Almeling et al.,⁸⁰ it highlights the vulnerability trade secrets face when much of their protection is based on nondisclosure agreements. It also indicates some of the presumptions which led to the signing of the EEA, as in Carr et al.,⁸¹ were concentrated misguidedly on outside threats, when the focus should have been on the internal threat to trade secrets.

74. See Jean O. Lanjouw & Mark Schankerman, *Protecting Intellectual Property Rights: Are Small Firms Handicapped?*, 47 J. Law & Econ. 45 (2004); Jean O. Lanjouw & Mark Schankerman, *Characteristics of Patent Litigation: A Window on Competition*, 32 RAND J. Econ. 129 (2001); Jean O. Lanjouw & Mark Schankerman, *The Quality of Ideas: Measuring Innovation with Multiple Indicators*, NATL. BUREAU ECON. RESEARCH, Working Paper No. 7345 (1999); Jean O. Lanjouw & Mark Schankerman, *Stylized Facts of Patent Litigation: Value, Scope and Ownership*, NATL. BUREAU ECON. RESEARCH, Working Paper No. 6297 (1997).

75. Mark Schankerman & Suzanne Scotchmer, *Damages and Injunctions in Protecting Intellectual Property*, 32 RAND J. Econ. 199 (2001).

76. JOSH LERNER & ADAM B. JAFFE, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT* (2004).

77. *Supra* note 69.

78. *Supra* note 7.

79. David S. Almeling, Darin W. Snyder, Michael Saponznikow, Whitney E. McCollum & Jill Weader, *A Statistical Analysis of Trade Secret Litigation in Federal Courts*, 45 GONZ. L. REV. 291 (2010).

80. *Id.*

81. See Carr et al., *supra* note 4.

Table 1: Characteristics of EEA Defendants

Characteristics of Defendants*								
	Total		Relationship to the Victim					
	Count	%	Outsider	%	Insider	%	Unknown	%
Nationality								
Foreign	32	22%	7	5%	25	17%		
National**	115	78%	18	12%	86	59%	11	7%
Total	147		25	17%	111	76%	11	7%

Source: EEA database on file with author.

* Reports on 136 of 147 defendants; insufficient information available for the missing 11 observations.

**If nationality unknown, defendant assumed to be U.S. national

The nationality of the defendants presents another test to the original presumptions of the EEA. As seen in the second column of Table 1, only 22% of the defendants were foreign nationals. Of the 32 foreigners charged with EEA violations, only one was convicted under § 1831 (Economic Espionage). Given the concern with economic espionage at the drafting of the EEA, these numbers suggest either economic espionage is less prevalent than trade secret theft, or its detection is more difficult.

Industrial Sectors of Victims

The EEA data also provide a look into the industries using trade secrets. The trade secret theft victim companies were classified by their Standard Industrial Classification (SIC) code. In the majority (57%) of cases, the victim company operated in the manufacturing sectors. Of those in manufacturing, the largest groups include those in semiconductor manufacturing and manufacturers with software applications. The second largest sector is the service industry (17% of cases) and the remaining cases are scattered throughout other sectors. In line with Cohen et al. (2000),⁸² the predominance of the manufacturing sector in EEA cases suggests protection of trade secrets from theft is particularly important to this sector. Manufacturing has long had patents available as a robust form of protection.⁸³ That the manufacturing sector, a sector that has both patent and copyright protection available, should be so active in trade secrets, emphasizes the importance of trade secrecy protection.

82. Wesley M. Cohen, Richard R. Nelson & John P. Walsh, *Protecting Their Intellectual Assets: Appropriability Condition and Why U.S. Manufacturing Firms Patent (or Not)*, NATL. BUREAU OF ECON. RESEARCH, Working Paper No. 7552 (2000).

83. Several studies examine the use of patents in manufacturing sectors, including Anthony Arundel & Isabelle Kabla, *What Percentage of Innovations Are Patented? Empirical Estimates for European Firms*, 27 RESEARCH POLICY 127 (1998), and F.M. Scherer, *Firm Size, Market Structure, Opportunity, and the Output of Patented Inventions*, 55 AM. ECON. REV. 1097 (1965).

Subject Matter of Stolen Trade Secrets

Trade secrecy protection has a large scope. It encompasses confidential information including source code; test data; strategic business information; and potentially patentable subject matters. In the EEA cases, as seen in Table 2 column 2, only 39% of the stolen trade secrets are deemed potentially patentable (meaning their subject matter is not excluded from patents; inventive step was not judged). 11% of stolen trade secrets had no descriptive information publicly available. 29% had only trade secrecy as a form of IP protection, which means this confidential information is particularly vulnerable and its theft particularly damaging. Table 2 shows the summary statistics of the characteristics of these stolen trade secrets.

Table 2: EEA Trade Secrets

<i>Characteristics of Stolen Trade Secrets: EEA Cases From 1996-2008</i>		
Type	Count	%
Potentially patentable	38	39%
Not patentable	47	49%
Protected by other IP	19	20%
Not protected	28	29%
Unidentified	9	11%
Total	95	

Source: EEA database on file with author.

It is important to emphasize these classifications are based on limited information regarding the nature of the stolen trade secrets. Given the requirements for patent protection, Table 2 likely represents an overestimation of the trade secrets that are potentially patentable. That these trade secret owners chose not to use those alternate protections is proof further of the importance of trade secret protection for protecting innovations.

The Criminalization of the theft of Trade Secrets

The Impact on Victims

In EEA cases, all of the victims have been corporations and not individuals. The decision of these firms to detect, investigate, report and proceed with criminal prosecution involves a different weighing of costs and benefits than is necessary in civil cases.

Benefits to the Victim Firm

From a resource perspective, a decision to seek a criminal prosecution involves a number of benefits to the victim firm. Unlike civil cases, the defendant in criminal cases

has a right to a speedy trial.⁸⁴ As a result, the victim firm potentially saves time and money avoiding a lengthy and resource-absorbing court case, as in *Nasheri*.⁸⁵ Additionally, unlike civil cases, the cost of criminal prosecution is borne by the government and not the victim.

Further benefits of choosing criminal prosecution of trade secrets theft include the ability to prosecute judgment-proof defendants, a stronger sense of retribution and a potentially stronger enforcement message. As Carr et al. note,⁸⁶ defendants without financial resources can commit trade secrecy theft, a civil suit resulting in damages can be a moot point as the judgment proof defendant is unable to pay. The criminal system avoids this with the option of incarceration as a form of punishment.⁸⁷ Incarceration may have a stronger sense of retribution for trade secret victims as trade secret thieves are removed from the workplace and society at large.⁸⁸ This incarceration also sends a strong enforcement message and decreases the expected benefits of theft.

Costs for the Victim Firm

Criminal prosecutions of defendants entail potential costs for the trade secret owner. A conspicuous resource cost associated with criminal prosecutions in EEA cases is lower financial damages awarded to the victim. However, a criminal action against the defendant does not preclude a parallel civil action. Victims can choose to seek both a criminal and a civil action⁸⁹ and, thereby, mitigate the lower damages observed in criminal cases.

Trade secret cases also run the risk of exposing the secret to the public gaze; however, the EEA does include confidentiality requirements.⁹⁰ The trade secret becomes vulnerable to exposure during court cases, which, by definition, will negate its secrecy, as discussed in Lowry.⁹¹ As Lerner notes,⁹² a cost to the victim of taking legal steps following the misappropriation of a trade secret is the potential for the loss of trade secrecy. Competitors may be able to glean strategic information from the court documents even if the trade

84. See, e.g., David Oblon, Gerald J. Mossinghoff & J. Derek Mason, *The Economic Espionage Act: Federal Protection for Corporate Trade Secrets*, OBLON, SPIVAK, McCLELLAND, MAIER & NEUSTADT, L.L.P. (March 1999), <http://www.oblon.com/publications/economic-espionage-act-federal-protection-corporate-trade-secrets>.

85. See *NASHERI*, *supra* note 12.

86. *Supra* note 4.

87. E.g., *Dnes*, *supra* note 58.

88. E.g., *DNES*, *supra* note 70.

89. Two examples in which the victim enacted a parallel civil suit in addition to the criminal charges are *United States v. Kern*, No. 2:99-cr-00015-DFL-1 (E.D. Cal., filed Jan. 21, 1999), and *United States v. Four Pillars*, No. 1:97-cr-00288-PCE-3 (N.D. Ohio, filed Oct. 1, 1997).

90. 18 U.S.C. § 1835 (“Orders to preserve confidentiality”).

91. Suellen Lowry, *Inevitable Disclosure Trade Secret Disputes: Dissolutions of Concurrent Property Interests*, 40 *STAN. L. REV.* 519 (1988).

92. Lerner, *supra* note 7.

secrets are not revealed. Inevitably, a court case will increase the number of Cozzi's "hints,"⁹³ and the availability of what Nasheri calls Competitive Intelligence,⁹⁴ by increasing the number of public documents related to innovative activities.

From a relationship perspective, the cost of choosing a criminal prosecution includes reputational and control costs. As with civil cases, the revelation a company has been the victim of a trade secrets theft can damage its reputation. The market may view the theft as evidence of lax security standards or future potential liability, as evidenced in Carr and Gorman.⁹⁵ Nasheri reports on a survey where nearly one half of respondents would not report a theft to anyone outside the company.⁹⁶ However, criminal charges are likely to have particularly adverse effects on a firm's relationship and reputation with its employees. As the EEA data demonstrate, the majority of defendants are insiders and employees may object to the criminal prosecution of one of their colleagues. Increased distrust can change company culture and lower social capital within a firm. Indeed, one critique of the functional consequences of the EEA is that it unfairly restricts labor mobility, as in Nasheri.⁹⁷

In addition, criminal prosecution requires the firm relinquish control over the action to the government.⁹⁸ While victims cooperate with the authorities, the FBI is in charge of the investigation and federal prosecutors will make important decisions related to the case. This loss of control presents a risk not found in civil cases where the plaintiff has significant control over the course of the case. Hence, the decision to seek criminal action involves a number of financial and other costs not associated with civil actions.⁹⁹ At the same time, the benefits may make a criminal action worthwhile. The firms in the EEA cases, by definition, weighed these costs and benefits ex-ante and proceeded with reporting the crime.

Criminalization and Detection

In order to have an accurate picture of the evidence found in the EEA prosecutions, it is essential to examine the external effects created by the advent of criminal prosecutions of trade secrecy theft. The EEA offers firms a means of seeking criminal, in addition to the existing civil, action against trade secret thefts. It also affects the behavior of employees and increases the potential punishment associated with theft.

93. Guido Cozzi, "Inventing or Spying" *Implications for Growth*, 6 J. ECON. GROWTH 55 (2001), describes the "hints" associated with innovative activity that alert would-be spies to the existence of such activity.

94. Nasheri defines Competitive Intelligence as "a systematic and ethical program for gathering, analyzing and managing information that can affect a company's plans, decisions and operations." NASHERI, *supra* note 12, at 73.

95. Carr & Gorman, *supra* note 11.

96. NASHERI, *supra* note 12, at 59.

97. NASHERI, *supra* note 12.

98. Carr & Gorman, *supra* note 11; *see also* Oblon et al., *supra* note 84.

99. Carr & Gorman, *supra* note 11.

Comparison to Civil Actions

Lerner investigates trade secret litigation for insights into trade secrets and compares this data to similar data on patent litigation.¹⁰⁰ He notes, “In those cases where the damages were determined, they averaged \$1.5 million in 2004 dollars. This is less than one-third the mean level of damages in the patent cases examined by Moore [2000].”¹⁰¹ In the EEA cases, which do not exclude the possibility of parallel civil cases, defendants are subject to fines, forfeitures and restitution. The victim can benefit from restitution but does not necessarily receive the benefits of fines and forfeitures. The median restitution was \$193,043, which is just over one tenth of the damages in Lerner’s cases. The average restitution of \$1.5 million resembles Lerner’s average more closely but has an upward bias due to a number of high awards as shown in Table 3.

Table 3: EEA Fines, Forfeitures and Restitutions

<i>EEA Fines, Forfeitures and Restitutions, 1996-2008</i>			
	Fine	Forfeiture	Restitution
# of defendants (%)	35 (24%)	1 (1%)	32 (22%)
63 (43%) defendants were subject to fine, forfeiture and/or restitution			
Mean	\$74,000	\$60,000	\$1,474,000
Standard Deviation	\$338,000	-	\$2,564,000
Minimum	\$500	\$60,000	\$500
Maximum	\$2,000,000	\$60,000	\$7,655,155

Source: EEA database on file with author.

An obvious difference from civil cases is the incarceration penalties associated with criminal cases, which are absent in civil cases. The EEA data have a conviction rate of 69% on at least one count (includes plea bargains). This compares to an estimated 90% conviction rate in federal court¹⁰² of all federal cases that go to trial. In EEA cases, as in Table 4, 61% of all defendants were sentenced to some form of incarceration, house arrest,

100. Lerner, *supra* note 7.

101. *Id.* at 13 (citing Kimberly A. Moore, *Judges, Juries, and Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365 (2000)).

102. See U.S. DEP’T OF JUSTICE, FY 2011 PERFORMANCE & ACCOUNTABILITY REPORT, at II-18 (2012) (reporting 93% of criminal cases as “favorably resolved”), available at <http://www.justice.gov/ag/annualreports/pr2011/section2.pdf>.

probation or supervised release. 61% of defendants were sentenced to probation, which averaged 33 months. Only 37% of defendants were incarcerated for an average of 22 months. However, as the conviction rate of EEA cases is 69%, this data indicate 88% of those convicted in EEA cases receive some form of incarceration, house arrest, supervised release or probation. When removing the five defendants classified as corporations, virtually all individuals convicted in EEA cases receive incarceration and/or probation sentences.

Table 4: EEA Incarceration and Probation

<i>EEA Incarceration and Probation, 1996-2008</i>		
	Incarceration and House Arrest	Probation and Supervised Release
# of defendants (%)	55 (37%)	89 (61%)
	90 (61%) defendants were subject to some form of incarceration and probation	
Mean (in months)	22	33
Standard Deviation	21.5	14.0
Minimum	2	6
Maximum	96	60

Source: EEA database on file with author.

Further work remains to be done on the empirical comparison of EEA criminal cases to trade secret civil cases. This work should provide insight into the policy differences between criminal and civil cases, the effects of the escalation of trade secrets to a felony and the influence on firms' behavior.

This section presented an empirical analysis of EEA prosecutions. The data challenges assumptions made in the drafting the EEA including the evidence that insiders and U.S. nationals are responsible for most alleged thefts. Furthermore, the data suggests the manufacturing sectors are particularly dependent on trade secrets and many of the secrets in question were reliant on trade secrecy. Finally, the data illustrates some differences between civil and criminal approaches to trade secrecy theft.

Conclusion

The EEA marked a change in the U.S. approach to trade secret theft and the threat of economic espionage. It also offered researchers an unprecedented opportunity to gain insight into the use of trade secrets by US firms, the composition of victims, the content of trade secrets and the composition and motivation of defendants. While the data have some disadvantages, it provides a hitherto unavailable insight into the world of trade secrets.

The data collected for this essay, 147 defendants in 95 cases of the EEA since its inception in 1996 until 2008, demonstrate that some of the original concerns of the drafters of the EEA were misguided. Insiders present the largest threat to trade secrets and are responsible for the vast majority of thefts. Non-nationals, the group whom the drafters of the EEA initially regarded as suspects, emerge as less of a concern, or at least a less detected problem than originally anticipated. The industry reporting the most thefts is the manufacturing sector, which suggests trade secrets are of particular strategic importance to these firms and their enforcement is a priority. Finally, the nature of the trade secrets in EEA cases reveals a mere 39% of them could be patented. Even with this liberal estimate, the choice of trade secrecy by firms indicates the firms view trade secrets as an important strategic IP tool and these secrets are particularly vulnerable to outright theft or other forms of misappropriation.

The efficiency of criminalization of the theft of trade secrets remains to be tested. As Dnes notes, the use of criminal law for tort-like actions can be appropriate. He notes that, “Broadly, the emphasis is on the nature of criminal intent, and the manner in which widespread impacts may have very high values attached to them.”¹⁰³ As more cases are prosecuted under the EEA, a clearer picture of the use of criminal law in place of tort or contract law with respect to trade secrets should emerge. ■

103. Dnes, *supra* note 58, at 123.