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Law and Economics: Nexus of Science and Belief

Robert C. Downs*

INTRODUCTION

"In the beginning,"¹ Ronald H. Coase² created the economic analysis of law.³ His insights, including the well known Coase Theorem,⁴ have since been acclaimed by some⁵ as the foundation of legal analysis—both positive and

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1. *Genesis* 1:1.

2. Ronald H. Coase is the Clifton R. Musser Professor of Economics Emeritus and Senior Fellow in Law and Economics at the University of Chicago. He was also Editor of the *Journal of Law and Economics* from 1964 to 1982. He was born in 1910, received his Bachelor's degree in Communication in 1932 and Doctor of Science degree in 1951 from the University of London. He also received a doctorate in Political Science from the University of Cologne in 1988 and a Doctor of Social Science from Yale University in 1989. Coase is often acknowledged as the intellectual guiding light and founder of the law and economics movement, having suggested the application of economics to legal problems throughout his long academic career.

3. See R.H. Coase, *The Nature of the Firm*, 4 *ECONOMICA* 386 (1937). Economic theory was used to study human behavior before Coase wrote his now famous 1937 article, *The Nature of the Firm*. Indeed, his challenges to the social welfare ideas presented in A.C. PIGOU, *THE ECONOMICS OF WELFARE* (5th ed. 1952), compose important parts of his writings. The use of economic analysis has, of course, been developed by many others, including the modern gurus, Frank H. Easterbrook, Daniel R. Fischel, and Richard A. Posner, of the "Chicago School."

4. See R.H. Coase, *The Problem of Social Cost*, 3 *J. L. & ECON.* 1 (1960) (discussing the Coase Theorem, so named by Stigler, which first appeared in Coase's 1960 article). This idea builds on the concept of transaction costs discussed in *The Nature of the Firm*. The firm, according to Coase, exists because the cost of individually negotiating the multitude of arrangements necessary to accomplish production would be excessive. The existence of the firm makes it possible for managers to direct activities without continuously negotiating all details. Thus, the existence of these "transaction costs," and the desirability of reducing them, causes firms to emerge. Firms are said to be more efficient because they reduce transaction costs. The Coase Theorem posits that if we assume that parties seek to maximize their joint production, in the absence of transaction costs the parties will negotiate to maximize their joint output regardless of which party had the initial legal right or privilege. Coase is not suggesting a world of zero transaction costs, but is emphasizing the importance of identifying what those costs are. COASE, *infra* note 5, at 15. The exercise then becomes one of establishing legal rules which reduce transaction costs (i.e. the most "efficient" rules), which may or may not comport with other ideas of "rightness" or "fairness."

5. Coase acknowledges that his ideas, although straightforward and simple, have been largely ignored or dismissed by other economists. R.H. COASE, *THE FIRM, THE MARKET, AND THE LAW* 1 (1988).

normative⁶—in numerous fields of law.⁷ Early claims by the law and economics movement that it engaged in pure scientific inquiry⁸ have, in recent times, given way to an admittedly normative and arguably semi-religious fervor,⁹ attracting adherents and supplicants in substantial numbers.¹⁰

6. See FRANK H. EASTERBROOK & DANIEL R. FISCHEL, *THE ECONOMIC STRUCTURE OF CORPORATE LAW* viii (1991). In purportedly joining the legal and economic disciplines, Easterbrook and Fischel describe their work as “an exercise in positive economics,” although they acknowledge that some of it is “openly normative—[the authors] take a few economic principles and preach to legislatures and judges about what the law ought to be if it is to promote social welfare.” *Id.* at vii.

7. See, e.g., EASTERBROOK & FISCHEL, *supra*; WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF TORT LAW* (1987); Elizabeth M. Landes & Richard A. Posner, *The Economics of the Baby Shortage*, 7 J. LEGAL STUD. 323 (1978).

8. See, e.g., William M. Landes & Richard A. Posner, *The Positive Economic Theory of Tort Law*, 15 GA. L. REV. 851 (1981); William M. Landes & Richard A. Posner, *Joint and Multiple Tortfeasors: An Economic Analysis*, 9 J. LEGAL STUD. 517 (1980); Richard A. Posner, *The Ethical and Political Basis of the Efficiency Norm in Common Law Education*, 8 HOFSTRA L. REV. 487 (1980).

9. The reference to religion is substantially tongue-in-cheek, but some similarities are unmistakable. There is a body of first principle beliefs that seems to be taken, at least in part, on faith. The idea that human beings are primarily, if not exclusively, utility maximizers, seeking personal advantage, is a given—within the law and economics community—and not subject to reevaluation by adherents. See Ian Ayres, *Making A Difference: The Contractual Contributions of Easterbrook and Fischel*, 59 U. CHI. L. REV. 1391 (1992) (reviewing EASTERBROOK & FISCHEL, *supra* note 6). Concepts of fairness, justice, human decency, love, personal sacrifice, and ideas of fundamental right or wrong are rejected—or at least superseded—by concepts of efficiency. Indeed, Easterbrook and Fischel deride and jeer at the words “fairness” and “equality,” stating that no standard for defining these terms exists and that any attempt to legislate fairness will only serve to “deter value increasing transactions.” EASTERBROOK & FISCHEL, *supra* note 6, at 110, 137. Followers of the law and economics movement find in it support for personal or political agenda items. There seems to be a strong correlation between adherence to law and economics tenets and conservative political and religious notions. See, e.g., Lyman Johnson, *Individual and Collective Sovereignty in the Corporate Enterprise*, 92 COLUM. L. REV. 2215 (1992) (citing to PETER L. BERGER, *THE HERETICAL IMPERATIVE: CONTEMPORARY POSSIBILITIES OF RELIGIOUS AFFIRMATION* 6 (1979) and ROBERT K. MERTON, *SOCIAL THEORY AND SOCIAL STRUCTURES* 456 (2d ed. 1968)); J.M. Balkin, *Too Good To Be True: The Positive Economic Theory of Law*, 87 COLUM. L. REV. 1447, 1455 (1987) (book review). But see William W. Bratton, Jr., *The “Nexus of Contracts” Corporation: A Critical Appraisal*, 74 CORNELL L. REV. 407 (1989), who avoids making the apparent connection between law and economics theory, and political and religious conservatism. Hostility toward governmental participation (called regulation or intervention) in the problem-solving process is endemic to the law and economics movement. Anecdotal evidence from student responses in law school courses in business and jurisprudence reveals an astounding affinity to the tenets of law and economics by those students who hold clearly conservative views on other topics, including religious topics.

Evangelistic enthusiasm is dramatic. Witness the summer law and economics conference held each year at Dartmouth College, Hanover, New Hampshire, which has prompted critics to respond with conferences to present counter-arguments. E.g., Symposium, *New Directions in Corporate Law*, 50 WASH. & LEE L. REV. 1373 (1993) (sponsored by the Frances Lewis Law Center and The Washington and Lee Law Review, in November, 1993). Acknowledgment of messianic leaders, who have “seen the light” and who will lead us out of the darkness of government intervention and state control, certainly includes Coase and perhaps Easterbrook, Fischel, and Posner.

10. Easterbrook and Fischel acknowledge both positive and normative intentions in their book, which they dedicate, in part, to Coase. EASTERBROOK & FISCHEL, *supra* note 6, at viii. For an example of unabashed “lavish praise,” see Ayres, *supra* note 9, at 1392, in which Easterbrook and Fischel’s book is extolled as maybe “the best book ever written about corporate law.”

This article contains criticisms of the law and economics movement, but does not assert that the use of economic analysis in evaluating social and legal problems is useless or inherently wrong. Rather, this article contends that the analysis is too narrow, too simplistic, relies too much on unproved, if not erroneous, assertions about reality, and that the law and economics claim to scientific truth is invalid. Economic analysis has descriptive and explanatory power, but neither the description nor the explanation provided by a purely economic analysis is complete. Many of the subtleties of human behavior are left out or left unexplained. Important and distinctively human values are ignored, devalued, or dismissed. The rich texture of the law, with its subtle nuances, careful judgments, and long-suffering search for justice and equity is not and cannot be so easily compartmentalized and explained with assumptions, equations, and assertions. The surreal legal landscape of the lawyer-turned-economist is truly, in the words of Justice Harry Blackmun, one in which a "chill wind blows."¹¹

Part I of this article includes an expository summary of law and economics theory (or the economic analysis of law), including its assumptions, assertions, theories, and applications. This section is intended to provide an essential understanding of what economic analysis of law is, how it works, and addresses some of its shortcomings.

Part II contains criticisms of the assumptions, techniques and uses of economic analysis, and in a broader sense criticizes the law and economics movement, generally. The criticisms of law and economics presented here relate to its failure to be accepted by economists, its tantalizing appeal to law professors, its claim of scientific inquiry, and its simplistic generalizations about human behavior. The criticisms and analysis focus in particular upon the leading proponents of the economic analysis of law, with emphasis upon the founding principles articulated by Ronald Coase. Separate treatment is given to Coase's "lighthouse" example and his general assumptions about human behavior as they relate to Chaos theory. Coase's assertions concerning bargaining theory and behavior are examined in connection with criticisms by Robert Cooter. The overall thrust of Part II is that it is much too early to declare victory or defeat of the economic analysis of law, and that early claims of having discovered fundamental truth are most surely wrong.

Part III provides a conclusion which is a call to avoid excessive reliance upon unproved and unsound "scientific" economic theory for answers to important and complex legal questions. Much is at stake. Better information is needed. A better view of law and humanity is needed to justify legal rules and principles than the simplistic assumptions of the new breed of "econo-lawyers" who tend to see the world through a much too highly focused and narrow lens.

11. *Webster v. Reproductive Health Services*, 492 U.S. 490, 560 (1989) (Blackmun, J., dissenting).

I. THE ESSENTIALS OF LAW AND ECONOMICS

A. *The Insights of Ronald Coase*

1. *Transaction Costs and the Theory of the Firm*

In his early work, in an effort to both undermine the power of social welfare economics¹² and to explain the existence and success of business organizations (firms), Professor Ronald Coase developed his now well known ideas about transaction costs. According to Coase, some economic principle or idea was necessary to explain why firms existed at all. Coase, and others, believed that such entities could not exist and flourish without some underlying economic justification. Coase claimed in his 1937 article, and continues to claim, that conducting business of all kinds involves a multitude of individual arrangements with the factors of production, including physical facilities, labor, materials, management, marketing, and other necessary functions.¹³ The arranging for and coordination of these factors of production, if done on a frequent individual contractual basis, is very time consuming and therefore costly. The organization of some of these factors of production under relational contracts within an ongoing business entity (a firm) would greatly reduce the costs of transacting continuously with each factor of production whenever it was needed. If the cost of transacting was zero (which Coase did not claim), products and services theoretically could be produced without firms since all factors of production could be reorganized freely. The facilities, materials, labor, and management would be hired (transacted for) each time anew to produce the desired widget or service. But, of course, transaction costs are not zero. This fact was recognized and seized upon by Coase as the reason firms existed. Coase thus used "transaction costs," and the need to reduce them, as the explanation for the existence of firms. Transaction costs were identified as the reason that individuals, conceived as being free to enter into individual contracts, in practice most frequently are part of large conglomerations of people and materials joined together in extensive enterprises.

Transaction costs include not only the obvious contracting costs of negotiating and coming to agreement, but also the time and money expended in identifying those with whom one needs to contract, the costs associated with gathering information about the market for the goods or services needed, and the

12. Welfare economics is that branch of economics that bears most directly on the evaluation of economic phenomena. Contrary to what the name suggests, it is not concerned exclusively, or even primarily, with governmental subsidies. Rather, it deals with the way various economic arrangements affect the welfare of all members of society. A central concept of welfare economics is the notion of economic efficiency. In fact, it has been defined as the study of how alternative economic arrangements promote or hinder the attainment of efficiency in the way resources are allocated. EDGAR K. BROWNING & JACQUELINE M. BROWNING, *MICROECONOMIC THEORY AND APPLICATIONS* (4th ed. 1992).

13. Coase, *supra* note 3.

general costs of monitoring and enforcing the terms of agreement.¹⁴ Once the “cause,” “creative force,” or “rationale” for the existence of firms has been identified as “merely” transaction cost, the need for and justification of governmental intervention in private business matters is substantially eliminated. According to Coase, only a narrow possible justification for governmental regulation of business remained: where the transaction costs of governmental regulation are less than those existing in the private sector.¹⁵ If governmental rules and regulations

14. See Stewart Schwab, *Coase Defends Coase: Why Lawyers Listen and Economists Do Not*, 87 MICH. L. REV. 1171, 1197 (1989) (book review) (reviewing pervasive transaction costs identified by Coase and others, that are connected with market problems). “Market failure can occur from free riders, limited information, convex production sets, moral hazard, adverse selection, and bounded rationality, to name a few manifestations of transaction costs.” *Id.* Schwab’s comments derive from, and are used to rebut, some of the underlying assumptions of neoclassical economic theory and serve to demonstrate, at least in part, why markets are far from perfect.

The neoclassical economics model does not recognize “transaction costs” and assumes first that people act in their own self-interest and that these self-interest choices are, in the aggregate, the best for society. Second, the model assumes that people act rationally, and third, that people have access to perfect information. Although this is not an all-inclusive list, Schwab’s terminology correlates specifically to these three assumptions.

The concept of the “free rider” is introduced to counter the assertion that individuals acting in their own self interest will indirectly benefit greater society. “Free riding” specifically hinders the ability of private markets to efficiently serve the demand for a public good. Even when a public good is worth more to people than it costs to produce, private markets will probably fail to provide it, since in order to produce such a good a community of residents must jointly agree to contribute. Using the construction of a bridge as an example, all residents realize they will benefit whether they contribute or not, and because of that realization, each resident has an incentive to understate what the bridge is worth to them. If all, or even a significant number of people behave as “free riders,” the bridge will not be built.

“Moral hazard” and “bounded rationality” are offered as limiting factors upon, if not outright refutations of, the assumption that people always behave rationally. “Moral hazard,” used frequently in the context of insurance markets, occurs when as a result of having obtained insurance, an individual’s behavior changes in such a way that the probability of an unfavorable outcome increases or its cost is greater when it does occur. For example, it is suggested that people with automobile insurance may be more careless about locking their cars or where they park them than those without insurance.

The idea of “bounded rationality,” as the term suggests, also places a limit on the hypothesis that all individuals act rationally. To put it simply, the totality of human experience suggests otherwise.

As Coase suggests, information markets are far from perfect. Consumers may lack information about product price as it relates to product quality, and firms may lack adequate information pertaining to consumer needs and preferences, thereby leading to “adverse selection.” Although this pattern can be found in other commercial endeavors, it is easily identified in insurance markets where, generally speaking, high risk and low risk customers are simply charged different rates reflecting the difference in risk.

Convex production sets result when a myriad of goods are simultaneously competing for finite customer demand, which again inserts inefficiency into the markets. BROWNING & BROWNING, *supra* note 12.

15. COASE, *supra* note 5, at 118. Although Coase states that direct governmental regulations will not necessarily give better results than leaving the problem to be solved by the market or the firm, he concedes that “equally, there is no reason why, on occasion, such . . . regulation should not lead to an improvement in economic efficiency.” *Id.*

create a more efficient¹⁶ outcome by reducing transaction costs, then the "intervention" may be warranted.¹⁷

2. *The Coase Theorem*¹⁸

In his 1946 article, *The Problem of Social Cost*,¹⁹ Ronald Coase asserted and attempted to demonstrate that in a hypothetical world of zero transaction costs (which he never claimed was a representation of the real world)²⁰ parties would bargain toward and achieve efficient utilization of resources (maximizing their joint output) independent of the legal rules allocating rights between them. He uses the now-famous farmer/rancher example to demonstrate his theory. The rancher's animals trample and destroy the farmer's crops. The law may either declare the rancher to be liable for the damage, or not. Coase claims that if the costs of negotiating and coming to agreement are zero, then the parties will bargain around the liability rule, whatever it is.²¹ Given this bargaining assumption, Coase then asserts that the same outcome will occur under either legal rule, and that the outcome will be efficient. The "allocation of resources would be independent of the legal position."²² The Coase Theorem thus undermines theories suggesting that any particular law may be fundamentally right or wrong. The desired rule of law is not determined by what is "fair or just" between the parties; rather, it is a matter of indifference, except to the extent that transaction costs are higher with one rule as compared to the next. Thus, the normative preference is to choose the rule with the lowest transaction costs or the one which will promote efficient bargaining. If one accepts the assumption that humans will always bargain to reach the efficient outcome, the economics-based rules seem irresistible.

3. *Externalities*

"Externalities" is a term used to describe the cost or burden imposed upon a third party who does not actually cause harm or directly receive benefits from the

16. Economic efficiency exists "when it is not possible, through any feasible change in resource allocation, to benefit one person without making some other person, or persons, worse off." BROWNING & BROWNING, *supra* note 12, at 632.

17. These circumstances will be rare, given Coase's general inclination against government intervention.

18. Coase did not name his idea or declare it a theorem, giving credit for that usage to George Stigler. COASE, *supra* note 5, at 14.

19. Coase, *supra* note 4.

20. Coase examined what would happen in a world where transaction costs were assumed to be zero but only to illustrate the fundamental role that transaction costs play in the economic system. *Id.* at 13.

21. More will be said about this bargaining claim, the correctness of which Cooter denies. See *infra* notes 127-139 and accompanying text; Robert Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1 (1982).

22. COASE, *supra* note 5, at 174.

production which caused harm.²³ Examples might include people who receive polluted water from an up-river source, or people who receive polluted air from a nearby factory. Coase addresses the problems raised by the existence of “externalities” which he refers to as the “harmful effects” of production. Thus, if a factory discharges smoke or other pollutants which injure or burden third parties who do not bargain for such hazards, these injuries or burdens are what Coase terms the “harmful effects” of the production process.

In standard welfare economics,²⁴ harmful effects of production are considered to be the fault of the producer. Thus, responsibility for curing the harm or paying damages for the injury naturally falls upon the producer. In cases with generalized damages and unidentifiable victims for purposes of compensation, a fine or taxation remedy is often suggested as a disincentive to the producer.

Coase addresses “harmful effects” by attacking the imposition of fault and the creation of governmentally-imposed disincentives. In *The Problem of Social Cost*,²⁵ Coase directly challenges welfare economics on the issue of harmful effects. Coase’s idea is straightforward. He says:

The traditional approach [of welfare economics] has tended to obscure the nature of the choice that has to be made. The question is commonly thought of as one in which A inflicts harm on B and what has to be decided is, How should we restrain A? But this is wrong. We are dealing with a problem of a reciprocal nature. To avoid the harm to B would be to inflict harm on A.²⁶

Therefore, Coase posits that the real question is whether A should be allowed to harm B or B should be allowed to harm A.

By way of explanation, Coase refers to his standard examples of the doctor who builds his office adjoining the confectioner’s building (and is thus disturbed by the confectioner’s vibrating machinery, which has existed in that same location for decades), and the rancher/farmer problem of whether the rancher should be responsible for crop damage done to the farmer by the rancher’s cattle. Coase asserts that the economic choice is between more medical services or confectioner products in the first example, and between meat or crops in the second. In examples concerning stream pollution which kills fish, the choice is between the benefits provided by the production which caused the pollution and the value of

23. Coase credits Paul Samuelson with coining the term “externality” in the 1950’s. *Id.* at 23 n.35. Coase preferred the term “harmful effect,” because he believed Samuelson’s usage connoted the message that the government should take steps to eliminate externalities. *Id.* at 24.

24. Coase identifies Pigou’s work as influential in leading mainstream economics down the erroneous path of welfare economics. *Id.* at 20.

25. Coase, *supra* note 4.

26. *Id.* at 96.

the fish that were killed. The choice is more products or more fish—a purely economic choice without right or wrong connotations.

Coase's treatment of victims of harmful effects as equivalent in righteousness to those who actually caused the harm is perhaps the greatest novelty of his "harmful effects" analysis²⁷ and the source of much hostile criticism, as well.²⁸ This analysis again focuses the inquiry on the overall social benefits of production, diminishing the usual sympathy associated with victims. Coase believes that persons injured by harmful effects impose costs upon the producer/polluters. These costs include expenditures to control smoke emissions and extra funds for the purchase or development of waste disposal alternatives. So, the injured persons are equally at fault, although the idea of fault loses much of its usual meaning in this context. Therefore, the problem becomes how best to achieve efficient utilization of resources. The choice of a legal rule concerning liability for "externalities" depends upon which rule (given transaction costs) will best bring about that efficient outcome. In fact, optimal efficiency may require the producer to pay for harmful effects, but the reason supporting such a requirement is the desire for economic efficiency, not any notion of fault or victims' rights.

Government regulation and taxation of producers to compensate the injured persons or groups or to serve as a disincentive to producers who create harmful effects, are seen by Coase as wrong.²⁹ Indeed, Coase expends considerable effort in "trashing"³⁰ Pigou's welfare economics ideas, and faults the economics community for embracing them.³¹

B. The Followers of Coase

Even if Coase is correct in his complaint that economics scholars have largely ignored his work,³² it is clear that his ideas have taken firm hold in the world of legal academics.³³ The evangelistic enthusiasm and creative efforts of three law

27. COASE, *supra* note 5, at 152.

28. See, e.g., William J. Baumol, *On Taxation and the Control of Externalities*, 62 AM. ECON. REV. 307 (1972).

29. Coase, *supra* note 4, at 96.

30. Coase was familiar with this behavior long before Critical Legal Studies writers made the term famous and the activity a way of life. See Mark G. Kelman, *Trashing*, 36 STAN. L. REV. 293, 293 (1984) (describing the technique of "Trashing" as taking specific arguments seriously, discovering that they are actually foolish and "then looking for some (external observer's) order . . . in the internally contradictory, incoherent chaos . . .").

31. COASE, *supra* note 5, at 23-24. Even as late as 1988, a major theme of the Coase book's introductory chapter is that the economics community has ignored his ideas and (perhaps through too much attention to politics) have remained enamored by social welfare government solutions. *Id.*

32. See Schwab, *supra* note 14, at 1188-94 (summarizing the evidence of receptivity to Coase's ideas by economics scholars).

33. *Id.* Schwab says that: "Although he and his Theorem are not without controversy in the law schools, and indeed may be on the defensive in recent years, Coase can hardly complain of being ignored in the law school world." *Id.* at 1189. "It is far more difficult for a law student to graduate without a serious encounter

professors at the "Chicago School"³⁴ are largely responsible for the early growth and development of economic analysis in law. Those professors are, of course, Richard A. Posner, Frank H. Easterbrook, and Daniel R. Fischel.³⁵

Posner has applied the techniques of economic analysis of law to numerous areas of legal study, including substantial work involving the analysis of tort law,³⁶ and the somewhat controversial article written with Elisabeth Landes, which contains an economic analysis of the baby adoption services and processes in America.³⁷ Posner is a strong proponent of the positive approach to the subject

with the Coase Theorem than it is for students obtaining a Ph.D. in economics." *Id.* at 1190-91.

34. "The Chicago School" refers to the law and economics movement originated by Posner, Easterbrook, Fischel, and others at the University of Chicago School of Law.

35. Richard A. Posner, born in 1939, is a noted federal judge, lecturer, and author. He received a Bachelor of Arts degree in English from Yale in 1959 and a law degree from Harvard in 1962. He clerked for Justice Brennan of the U.S. Supreme Court from 1962 to 1963, was an assistant to the Commissioner of the Federal Trade Commission from 1963 to 1965, and was Assistant to the Solicitor General from 1965 to 1967, and General Counsel to the Presidential Task Force on Communications Policy from 1967 to 1968. He then served as an Associate Professor at Stanford University Law School from 1968 to 1969 and Professor at the University of Chicago Law School from 1969 to 1981. He became a circuit judge on the United States Court of Appeals for the Seventh Circuit in 1981 where he continues to serve. He has written extensively in support of Law and Economics. *See, e.g.,* Richard A. Posner, *The Strangest Attack Yet on Law and Economics*, 20 HOFSTRA L. REV. 933 (1992); *Remarks on Law and Literature*, 23 LOY. U. CHI. L.J. 181 (1992); *Law and Economics is Moral*, 24 VAL. U. L. REV. 163 (1990).

Frank H. Easterbrook, born in 1948, is a judge on the United States Court of Appeals for the Seventh Circuit. In 1970 he received his Bachelor of Arts Degree from Swarthmore College after successfully pursuing dual majors in Economics and Political Science. He received his law degree from the University of Chicago in 1973. He served as a clerk to the United States Court of Appeals for the First Circuit during 1973 and 1974, and as Assistant to the Solicitor General of the United States from 1978 to 1979. He joined the faculty of the University of Chicago as an Assistant Professor of Law in 1978, became a full professor in 1981, and departed for the federal bench in 1985.

Daniel R. Fischel, born in 1950, is a professor at the University of Chicago Law School. He received a Bachelor's degree from Cornell University in 1972, a Master's degree from Brown University in 1976, and a law degree from the University of Chicago in 1977. He served as a law clerk for the Chief Judge of the United States Court of Appeals for the Seventh Circuit in 1977 and 1978, and for The Honorable Justice Potter Stewart of the U.S. Supreme Court from 1978 to 1979. He joined the Chicago law firm of Levy & Erens in 1979, and began teaching law at Northwestern University in 1980. Fischel joined the University of Chicago Law School faculty in 1982.

Easterbrook and Fischel are recognized scholars on law and economics, and have collaborated on numerous articles on the subject. *See, e.g.,* Easterbrook & Fischel, *Corporate Control Transactions*, 91 YALE L.J. 698 (1982); *Voting in Corporate Law*, 26 J. L. & ECON. 395 (1983); *Mandatory Disclosure and the Protection of Investors*, 70 VA. L. REV. 669 (1984); *Limited Liability and the Corporation*, 52 U. CHI. L. REV. 89 (1985); *Optimal Damages in Securities Cases*, 52 U. CHI. L. REV. 611 (1985); *Close Corporations and Agency Costs*, 38 STAN. L. REV. 271 (1986). *See also* EASTERBROOK & FISCHEL, *supra* note 6.

36. WILLIAM M. LANDES & RICHARD A. POSNER, *supra* note 7.

37. *See* Elizabeth M. Landes & Richard A. Posner, *supra* note 7. The "shock effect" of choosing baby adoption procedures as a topic of analysis drew attention to the article written by E. Landes and Posner. The harsh treatment of the topic, an emotion-laden issue for many people, makes using the article in law school teaching problematic. The exclusion of non-white babies from the analysis, although perfectly legitimate from an analytical point of view, has been a source of concern to non-white law students. Likewise, the continued reference to babies as "products," and the adoption process as the "market," creates particular consternation among students who were adopted. These responses to the article were observed in seminar classes in the Jurisprudence course at the University of Missouri-Kansas City, School of Law.

of law and economics, continually claiming,³⁸ and often inferring,³⁹ that he is engaged in straightforward scientific (or theoretical) inquiry, attempting to determine how the law actually works, and using economic analysis to uncover the instances where the rules of law are inefficient.⁴⁰ The normative aspect of Posner's work comes through in the implicit and often obvious assumption that what empirical inquiry reveals to be "true," the rest of humanity "ought" to believe and act upon.⁴¹ Proof of Posner's dissatisfaction with the answers—or lack thereof—provided by pure economic analysis is found in his 1990 book, *The Problems of Jurisprudence*,⁴² in which he sets forth his version of the theory of Practical Reason.⁴³ Posner does not reject economic analysis of law, but relegates it to a supporting role in a larger theoretical matrix. His vision of how judges adjudicate, and the considerations most important in reaching sound decisions have been described as follows: "These methods include a 'grab bag' of common sense, intuition and tacit knowing, the test of time, introspection, interpretation, experience, reasoning by analogy, metaphor, anecdote, imagination, empathy, imputation of motives, induction, reliance on authority, precedent, and custom."⁴⁴

38. See RICHARD A. POSNER, *THE PROBLEMS OF JURISPRUDENCE* 63 (1990) (stating unequivocally that "Law and Economics" is a branch of economics and as such "really is a science, though an immature one").

39. See Richard A. Posner, *Some Uses and Abuses of Economics in Law*, 46 U. CHI. L. REV. 281, 284-295 (1979). In his earlier works Judge Posner unequivocally expressed his interest in the positive economic analysis of law, or "what is," and his disdain for the normative, or "what ought to be." He explains that positive analysis, by virtue of its emphasis on explanation and understanding is "the domain of science and economics is the science of rational human behavior." According to Posner, the positive theorists, embracing a form of efficiency hypothesis, believe that the common law system is an "engine of wealth maximization, not that it should be one." Simultaneously, he chides lawyers as being "inveterately normative," presumably incapable of identifying the distinctions between positive and normative analysis in their objections to the application of economic analysis to law.

Despite his attempts to distance himself from the normative approach, however, Posner ultimately concluded that positive economic analysis, with its emphasis on efficiency, is not "the only valid application of economics to the law." From this assertion, one could reach the decidedly "normative" conclusion that one *ought* to embrace this mode of analysis if one is seriously interested in understanding our largely judge-made legal system. No wonder lawyers seem confused.

40. See, e.g., Elisabeth M. Landes & Posner, *supra* note 7, at 324. Posner and E. Landes attempt to develop "a model of the supply and demand for babies for adoption under the existing patterns of regulation [to] show (1) how that regulation has created a baby shortage (and, as a result, a black market) by preventing a free market from equilibrating the demand for and supply of babies for adoption, and (2) how it has contributed to a glut of unadopted children maintained in foster homes at public expense." *Id.*

41. See ROBIN PAUL MALLOY, *LAW AND ECONOMICS: A COMPARATIVE APPROACH TO THEORY AND PRACTICE* 62 (1990) (noting that although most people would argue that slavery is wrong simply because it is immoral or because it violates "natural rights" concepts of freedom and humanity, Posner would argue on the basis of empirical evidence that slavery is wrong because it is inefficient and thereby not a wealth-maximizing relationship).

42. POSNER, *supra* note 38.

43. See Nancy Levit, *Practically Unreasonable: A Critique of Practical Reason*, 85 NW. U. L. REV. 494 (1991) (reviewing Posner's book and providing an in depth analysis of Posner's jurisprudential theories).

44. *Id.* at 498.

In contrast to Posner's broad theoretical writings and grand theory building, the contributions of Easterbrook and Fischel⁴⁵ have been dominated by their interest in corporate law.⁴⁶ Using the "contractarian" approach to analysis and problem solving, this pair has tackled the significant contemporary subjects of modern corporate law scholarship, such as: shareholder voting rights, including the proxy system; shareholder dissenters' rights; directors' responsibilities, including the duties of care, loyalty, and the obligations created by the corporate opportunity doctrine; corporate takeovers, including proxy fights and tender offers; securities law, specifically with respect to information disclosure and insider trading issues; and others. Their approach is direct and unabashedly both positive and normative.⁴⁷ It seems clear that Easterbrook and Fischel believe they have found a modern "Rosetta Stone,"⁴⁸ which unlocks the mysteries of corporate law. Their undertaking, done with a good measure of enthusiasm and hope, is to spread the revealed truth. As might have been (and probably was) expected, their effort has met with diverse reactions.⁴⁹ Their conclusions depend upon the correctness and usefulness of the contractual metaphor they employ in all (or nearly all) corporate law analysis. Their approach begins (and arguably ends) with Ronald Coase.⁵⁰ They argue that governmental regulation of corporations and other business entities, including rules governing owners, managers and third parties, is inappropriate except to the extent that such regulation may, in the rare circumstance, provide the most efficient rule. Conventional ideas about ownership of business entities are rejected. Shareholders, the owners of corpo-

45. Easterbrook and Fischel are referred to collectively because of their numerous co-authorships. *Supra* note 35.

46. EASTERBROOK & FISCHEL, *supra* note 6.

47. *Id.* at 15; *see id.* ("The normative thesis of the book is that corporate law should contain the terms people would have negotiated were the costs of negotiating at arm's length for every contingency sufficiently low. The positive thesis is that corporate law always conforms to this model.")

48. The Rosetta Stone is a tablet of black basalt found in 1799 at Rosetta, a town in Egypt at one of the mouths of the Nile; because it bore parallel inscriptions in Greek and Egyptian, it provided a valuable key to deciphering ancient Egyptian writing. NOAH L. WEBSTER, WEBSTER'S NEW TWENTIETH CENTURY DICTIONARY (2d ed. 1977).

49. Compare Ayres, *supra* note 9, at 1392 (warning the reader that lavish praise is forthcoming and exclaiming "[t]his book may be the best book ever written about corporate law") with Lawrence E. Mitchell, *The Cult of Efficiency*, 71 TEX. L. REV. 217, 241-42 (1992) (reviewing the Easterbrook and Fischel book and concluding:

Ultimately, one finishes this book with both a sense of wonderment and a sense of emptiness. The wonderment comes at the scholarly success Easterbrook and Fischel seem to have achieved on the basis of these theories. Although I cannot prove this, "casual empiricism" in my own classroom suggests that law students who are greatly discomforted by uncertainty, indeterminacy, and the hard-won development of judgment as pervasive themes in our legal and social system (and dare I say, human nature) are quick to embrace any model that is simple, clear, easy to apply, and, with an eye towards final exams perhaps, predictable, all of which the Easterbrook and Fischel model certainly is. The emptiness comes from the realization that the world that the authors envision is a world of detachment, interpersonal indifference, and narrow greed.).

50. EASTERBROOK & FISCHEL, *supra* note 6, at 355.

rations, are referred to as stake-holders or beneficiaries of residual assets, in the same terminology as bond holders or other creditors.

C. Applications of Economic Analysis to Law

1. General Assumptions

Whether one is examining the potential legal entanglements between farmers and ranchers,⁵¹ doctors and confectioners,⁵² or among adoptive parents, adoption agencies, and expectant mothers (and perhaps fathers),⁵³ the economic analysis employed involves essentially the same methodologies and techniques. A unifying theme found in each example is the acceptance of certain assumptions about human behavior and the use of specialized principles of economics. The accepted assumptions and economic principles include the following conclusions:⁵⁴

- (a) individual consumers can get access to good information;
- (b) individuals know what they want;
- (c) individuals can take cues generated by the market;
- (d) the market does not care about the issue of fairness and justice. Allocation of scarce resources is made on "votes of dollars." The market leaves it to society to provide equal opportunity;
- (e) the market will price whatever product or issue is under consideration;
- (f) there is a certain degree of competition in that there are multiple buyers and sellers;
- (g) people and resources are freely movable;
- (h) there is acceptance of the current distribution of income and resources;
- (i) the supply and demand theories, and the graph curves which represent them, are substantially correct;
- (j) the corollary to the supply and demand theories is also true, that as the price (cost) of a thing increases, its demand (utilization) will decrease;⁵⁵
- (k) efficiency is understood to mean the acquisition or utilization of a thing (including products, rights, etc.) by the person who values it most;

51. See COASE, *supra* note 5, at 97.

52. See *id.* at 105.

53. See Elisabeth M. Landes & Richard A. Posner, *supra* note 7.

54. See, e.g., BROWNING & BROWNING, *supra* note 12; SCOTT & NIGRO, *PRINCIPLES OF ECONOMICS* (1982).

55. See COASE, *supra* note 5, at 4 (using price "in its widest sense" he describes the example of people crossing a dangerous thoroughfare to get to a select restaurant, and notes that "whether men are rational or not . . . we can be sure that fewer will do so the more dangerous it becomes.").

- (l) efficiency is a worthy objective;⁵⁶
- (m) rules of law (whether judicially or legislatively defined) should encourage people toward efficient behavior;
- (n) regardless of which rule of law is applicable, i.e., favoring the farmer or the rancher, the parties will, in the absence of transaction costs, reach the same solution to their problem, and that solution will be efficient;⁵⁷
- and
- (o) there is no fundamental right or wrong to these conflicts, since each party may be properly characterized as imposing costs upon the other.⁵⁸

Thus, the goal of law under a purely economic theory becomes the creation of rules which decrease transaction costs, so that the parties may, as nearly as possible, achieve efficient solutions to their problems. An obviously related idea (stressed by Coase) is that government regulation is inappropriate unless it has the effect of reducing transaction costs.⁵⁹

2. Coase and Posner Examples

Coase, dealing mostly in tort rules, presents what have become the standard examples demonstrating how parties contract around legal rules and how the rules may influence behavior. In his cattle owner versus farmer example, he attempts to show that it does not matter whether the law requires the cattle owner to pay for crop damage caused by the animals. In either case, the land will be utilized in its most efficient use, by the party who values it most for that use. If the law does

56. See generally BROWNING & BROWNING, *supra* note 12, at 632. According to the Brownings and other economists, "economic efficiency" is often used interchangeably with the term "Pareto optimality," after the Italian economist Vilfredo Pareto who first outlined the concept. Within this context an allocation of resources is said to be efficient, when it is not possible through any feasible change in resource allocation to benefit one person without making some other person, or persons, worse off. *Id.*

This form of economic analysis has been adopted for use in the economic analysis of law according to Cooter. See Robert D. Cooter, *The Best Right Laws: Value Foundations of The Economic Analysis of Law*, 64 NOTRE DAME L. REV. 817, 820-21 (1989). Originally, economic theories assumed a given distribution of resources. Once the initial distribution was described, the analysis proceeded to ask whether any reallocation of resources can make at least one party better off without making anyone else worse off. If the answer was yes, the reallocation was a "Pareto improvement." Pareto efficiency was achieved by reallocating resources until opportunities for Pareto improvement were exhausted. A "Pareto optimal" economy can be described as maximizing the value of resources to the people who enjoy them. *Id.*

Two British economists, Nicholas Kaldor and John R. Hicks came up with a different measure of efficiency. The Kaldor-Hicks theory is not concerned with whether or not a reallocation of resources will make certain individuals worse off, but rather whether society's "aggregate utility" has been maximized. A reallocation of resources is efficient if those who gain from it obtain enough to fully compensate those who lose from it, although there is no requirement that compensation take place. BROWNING & BROWNING, *supra* note 12, at 40.

57. See COASE, *supra* note 5, at 104.

58. See *id.* at 26-29.

59. *Id.* at 23, 118.

not require the cattle owner to pay for the damage, the farmer will (according to Coase) bargain with the cattle owner to pay the cattle owner not to permit the crop damage. The amount the farmer will be willing to pay and the amount the cattle owner will be willing to accept depend upon which use of the land (crop growing or cattle roaming) has the highest utility, and that utilization will win out. Likewise, if the law holds the cattle owner responsible for crop damage done by the owner's cattle, the cattle owner will be willing to bargain with the farmer to obtain permission, or will be willing to pay the damages. Again, the highest utilization will prevail because the amount needed to bargain successfully with the farmer or the amount required in damages will, by definition, be inherent in the higher utilization.⁶⁰

The same analysis is applied to so-called "externalities," those costs imposed (arguably) upon third parties who are not directly involved in a transaction. Such third parties include persons who receive polluted water down stream or people who breath polluted air near factories. Coase, starting from an assertedly neutral position which favors neither the polluter nor the victim, claims that the imposition of costs is a kind of reciprocal problem. He would say that, if it is proper to characterize the factory (which dumps toxic waste into the river) as imposing costs upon downstream inhabitants and water users ("externalities"),⁶¹ then it is equally proper to say that the downstream parties are imposing costs upon the upstream polluters. If the downstream parties force the upstream polluters to "clean up their act" (through rules imposing liability upon polluters), the costs of such clean-up are additional costs of doing business for the polluter. Since there is no "right" original position, neither party may be seen, in economic terms, as innocent or guilty. Indeed, ideas of innocence or guilt become irrelevant to the discussion. What is needed then, according to Coase, is a rule of law which directs the parties toward the most cost effective solution to the problem. The factory will be held responsible for its discharge of toxic waste if, but only if, a liability rule will result in the most efficient curative measure. If, on the other hand, the absence of a liability rule would entice the downstream users to protect themselves with the most cost efficient solution to the problem, then the factory should not be held responsible for damages. In all of this discussion, the goal is to reach the least costly solution to the problem, measured in dollars, with efficiency being determined by the party willing to pay the most for a particular utilization of the stream water. The focus is placed squarely upon the efficient solution to the problem rather than upon who may have caused damage to whom. The purported objective of all this is to reach what Coase considers the greatest good for the society as a whole. No judgment is made about whether it is a good

60. *Id.* at 97-102.

61. *See* COASE, *supra* note 5, at 22.

idea to pollute the stream in the first place. Pollution is seen merely as a normal consequence of production.⁶²

Although Posner's examples usually focus primarily on tort law,⁶³ his dramatic excursion into family law is of particular interest. In that example he argued that the child adoption system would work more efficiently if mothers were legally permitted to sell their babies to the highest bidder. Posner asserts that under his proposed system the intervention of private and governmental "adoption agencies" would be unnecessary and their conflicting interests (identified by Posner) would be eliminated in a free market. The babies would end up with the adoptive parents who valued them most (in terms of dollars) and the purchase price would regulate the supply and demand so that there would be enough, but not too many, babies to go around⁶⁴—a tidy arrangement for all concerned.

62. This is but one view of the externalities problem. Others consider certain harms, like pollution, to be inherently wrong, or nearly so. See, e.g., James R. Calve, *Environmental Crimes: Upping the Ante for Noncompliance with Environmental Laws*, 133 *MIL. L. REV.* 279 (1991); Steven L. Humphreys, Comment, *An Enemy of the People: Prosecuting the Corporate Polluter as a Common Law Criminal*, 39 *AM. U. L. REV.* 311 (1990); Manik Roy, Ph.D., *Pollution Prevention, Organizational Culture, and Social Learning*, 22 *ENVTL. L.* 189 (1992). Nor do these simple two-party examples bear much resemblance to real life. The transaction costs generated in determining who are polluters and who are victims in real life pollution of air, water and soil are dramatic. If fifty factories discharge smoke or dump waste which injures many groups of people, sophisticated and complex systems are required to fashion remedies. The transaction costs involved in evaluating pollution damage, identifying pollutant sources, determining curative possibilities, and measuring harm done to existing groups (forgetting future generations for the moment) are not easily determined. The likelihood that the relevant parties will be able, on any basis, to work out satisfactory solutions is, at best, remote. Even if determinable, the harms are so great and the solutions are so expensive that to expect interested parties to somehow "bargain" for efficient solutions seems naive. Certainly, legislative solutions have been the order of the day, forcing remediation of contaminated sites and imposing remediation costs on responsible parties; emphasizing control over hazardous substances; and mandating decreased emissions of pollutants into air and water. See, e.g., Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Pub. L. No. 96-510, 94 Stat. 2767 (codified as amended in scattered sections of 42 U.S.C.); Clear Air Act, Pub. L. No. 86-365, 73 Stat. 646 (codified as amended in scattered sections of 42 U.S.C.).

63. See WILLIAM M. LANDES & RICHARD A. POSNER, *supra* note 7. In his review of *THE ECONOMIC STRUCTURE OF TORT LAW*, Jack Balkin challenges the authors' assertion that "tort law is a public good . . . created by a political system to benefit the entire community" which would be supported by all major groups in society because it is in their interest to "support policies that will increase the wealth of society as a whole" since "the group can be expected to share in that increase." Balkin, *supra* note 9, at 1480. According to Balkin, the authors ignore tort law's redistributive consequences; they ignore the "very different understandings of the respective roles of courts and legislatures that have existed between 1100 and the modern era," and have "not explained the incentive of judges to cooperate in the production of this [public] good." *Id.* at 1481-82.

64. See Elisabeth M. Landes & Richard A. Posner, *supra* note 7. E. Landes and Posner demonstrate that the economic analysis of law can be applied to any subject matter. To that extent it has been successful. It is also, however, an example of reductionism run amuck. So much is left out. For example, all minority-race babies are omitted from the analysis. Would the market really work in the way Posner posits? What impact would the existence of such a market have on expectant mothers? Are there any emotional or other consequences to mothers who "sell" their children? Is selling a child due to necessity or out of love the same as doing it for profit? What will everyone else think? Is a society that "sells" its children the same as one that does not? Are the children better off? What are the consequences to a society which begins to talk about its members and their children as products, human capital, and factors of production?

3. *The Corporation as a Nexus of Contracts*⁶⁵

Easterbrook and Fischel use the "contract" metaphor as the linchpin of their general theory of corporate law.⁶⁶ The old "trust" theory is rejected,⁶⁷ as is the even older idea that corporations owe their existence to and obtain legitimacy from concessions by government.⁶⁸ Regarding the debate over the proper relationship between a corporation's management and its shareholders, the so-called managerial model, which asserts that the management group is employed by the corporation to generate profits for the shareholders, is dismissed, in favor of a market model with behavior justifications based upon contract principles.⁶⁹ Their approach is, they admit, both positive and normative. They assert and attempt to show that much of corporate law does in fact comport with a contractarian explanation. They find efficiency (in terms of economics) in modern corporate law. They argue that corporate law should develop in accordance with efficiency principles, and that the contract metaphor best describes how the law actually works and how it ought to be fashioned. In addition to standard economic-analysis assumptions and principles, Easterbrook and Fischel utilize several concepts especially applicable to corporate and securities law. Their analysis and argument proceeds, generally, as follows:

- (a) Old explanations of corporate law are inadequate. The alleged injury to shareholders by avaricious management is untrue and thus does not justify judicial or legislative intervention to protect shareholder investors.⁷⁰
- (b) Investors are not powerless victims, but are able to protect themselves by not investing or by selling investments with which they are dissatisfied.⁷¹
- (c) All business consequences are products of the capital market. Choices of state corporate law, capital structure, management behavior, promised return on investment, and numerous others are merely the function of the capital market. Capital will be attracted to (and will continue to support)

65. This terminology draws on the original language of Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305, 310 (1976).

66. EASTERBROOK & FISCHEL, *supra* note 6, at 12.

67. See generally Lewis A. Kornhauser, *The Nexus of Contracts Approach to Corporations: A Comment on Easterbrook and Fischel*, 89 COLUM. L. REV. 1449 (1989).

68. William W. Bratton, Jr., *The New Economic Theory of the Firm: Critical Perspectives From History*, 41 STAN. L. REV. 1471, 1484 (1989).

69. EASTERBROOK & FISCHEL, *supra* note 6, at 4. Easterbrook and Fischel claim that managers are driven by the "invisible hand" to "act as if they had investor's interests at heart," and assert that there is a limit to the extent to which managers can enrich themselves at investors' expense. *Id.*

70. *Id.* at 1.

71. *Id.* at 4.

firms that are most attractive. Attractiveness to some extent depends upon promises made and the believability of those promises. So, promises need to be both attractive and enforceable. The focus of the inquiry, then, should be upon finding ways to reduce the effects of divergent interests (between management and shareholders) and upon finding legal and automatic enforcement devices. Firms that make the best choices (for shareholders) will prosper.⁷²

(d) Corporations are merely financing devices, in which the investors bear the risk of failure and in return receive the marginal rewards of success.⁷³ The relationships between suppliers of capital, property, and human services are seen in terms of contract. The corporation is merely the point (nexus) at which the various contracts converge. Voluntary adventurers come together to maximize their utilities. Some of the contract terms are negotiated directly, some are negotiated indirectly through the actions of capital markets, and some are provided by legal choices or requirements. Corporate laws, whether mandatory or optional, are described as gap-fillers, to supply the terms which have been omitted from the actual contracts (or relationships) among the parties. The justification for legislatively or judicially supplied gap-fillers is to provide the default terms to which the parties "would have agreed" had they addressed the particular issue. Even mandatory provisions (which cannot be countermanded in articles of incorporation) are seen in contract terms, since it is asserted that such laws often create offsetting voluntary arrangements. The parties contract around the law, either explicitly or by their market-based actions.⁷⁴

(e) Corporate law is equivalent to a standard form contract: a backdrop of default rules which controls unless the parties have otherwise agreed. The normative thesis is that corporate law should contain the terms people would have negotiated, were the costs of negotiating each issue sufficiently low. The positive thesis is that corporate law almost always contains such terms.⁷⁵

(f) In the absence of explicit contracts between real parties, the terms supplied (in addition to gap-filling laws) are those negotiated by group representatives such as bond indenture trustees, labor unions, and investment bankers. Even in situations where no claim of negotiation (either personal or representative) can be made, Easterbrook and Fischel

72. *Id.* at 6.

73. *Id.* at 10. Limited liability is not a function of corporateness, but merely an attribute of investment. Although it is convenient to refer to a corporation as an "it," this reification, according to Easterbrook and Fischel, has the bad side effect of causing people to overlook the fact that the firm is really only a voluntary combination of elements of production, including people, property, and capital. *Id.*

74. EASTERBROOK & FISCHEL, *supra* note 6, at 12.

75. *Id.* at 15.

contend, as a major element of their general theory, that all provisions of the "contract" are "priced" in the market. All choices about factors of production, including all promises, expectations, and risks are evaluated and priced by the market.⁷⁶ It is asserted that the independent knowledge of investors is irrelevant. There is no need for investors to know about the specifics of the bargain, as contained in articles of incorporation, bylaws, or disclosures in securities offering documents. The important facts are all known by expert professional securities traders, and every contract term is reflected in the market price of the corporate security.⁷⁷

(g) Risks related to individual securities, such as lack of investor information, mismanagement, shark repellent provisions, or excessive reliance on borrowed funds (high leverage) can all be handled by risk-averse investors by simply diversifying their investment portfolios.⁷⁸

(h) The fact that there is a market for corporate control, creating the potential for proxy fights and tender offers, restrains management from victimizing shareholders.⁷⁹ Management will align its behavior with shareholder interests, so the argument goes, since a failure to do so will increase the risks that shareholders (or others) will solicit proxies to remove the management group, and that outsiders will attempt a take-over by tender offer. Essential to this argument is the assumption that the failure of management to maximize shareholder interests will cause stock prices to decrease enough to materially increase the noted risks.

76. *Id.* at 18. The Coase Theorem, of course, plays an important role in supporting the market pricing portion of the nexus of contracts idea.

77. *Id.* Unflinching reliance upon the expertise of securities traders and the market price generated by their trading behavior is buttressed by the additional market based argument that securities traders who do their trading badly will be weeded out (for lack of clients), leaving only (or at least mostly) those who do it best.

78. *Id.* at 29. Easterbrook and Fischel also point out that a portfolio of ten equity securities will eliminate most unsystematic risk (risk that is attributable to investing in a particular corporation). *Id.* at 122 n.6. *But see* BURTON G. MACKIEL, *A RANDOM WALK DOWN WALL STREET* 201-02 (4th ed. 1985) (suggesting that it might take a portfolio of as many as twenty securities to "substantially eliminate" unsystematic risk).

79. EASTERBROOK & FISCHEL, *supra* note 6, at 32. The stock market, according to pricing theory, prices all known factors influencing the value of the firm. Thus, unless the terms of the deal changed after purchase, investors got what they paid for. The harder question is what to do about changes which occur after investors are in the deal. The answer to this problem of the "latecomer" term is found by Easterbrook and Fischel in several instances. The shareholders have voting rights (which are admittedly insufficient due to shareholder apathy and lack of power). Shareholders may, in certain circumstances, have dissenter appraisal rights. Shareholders could instigate a proxy fight or encourage a take-over effort. Since none of these possibilities offers adequate protection for the shareholder who falls victim to a change in the rules of the game, Easterbrook and Fischel fall back on the contract metaphor. The "possibility" that the deal could be changed (by management or majority shareholders) contrary to the interests of minority shareholders (or a majority of shareholders), was "known" at the time of investment. Therefore, that term of the contract (risk of adverse change) was fully priced in the market. Thus, no matter how much the shareholder is harmed by voracious management or hostile majority shareholders, there is no "unfairness" because the shareholder received the security at an appropriate price. *Id.* at 32-34.

(i) Investors in modern corporations do not care about distributive justice questions, so long as they are maximizing their own utilities. If the pie is made larger, the fact that someone else may receive a greater percentage of the increase is of no concern.⁸⁰

(j) Finally, Easterbrook and Fischel conveniently (and perhaps of necessity) make no broad social welfare claims.⁸¹ The contractarian theory of corporate law does not (and, according to them, need not) address the long-standing questions about the proper “goals” of the corporation, the moral hazard problems of distributive justice, or the optimal ways of dealing with pollution, bribery or other social problems. Indeed, the authors flatly ask, “Who cares?”⁸² They affirmatively deny any claim that profit and social welfare are perfectly aligned.⁸³

II. THE PROBLEMS OF LAW AND ECONOMICS

This part of the discussion includes a variety of criticisms of economic analysis of law.⁸⁴ The critique is prompted, at least in part, by the potentially powerful political consequences the assumptions, assertions and conclusions embodied in economic analysis of the law may engender. Law and economics theory is essentially conservative. It glorifies the unregulated free market and vilifies government regulation of business. It bases its conclusions upon assumptions of neo-classical micro-economic theory. It seduces converts with simplicity, certainty, self-fulfilling prophecy, and assertedly morally neutral answers to otherwise thorny problems.⁸⁵

80. *Id.*

81. The authors make no broad social welfare claims, other than, of course, those implicit in contractarian efficiency, wealth maximization, and economic theory generally.

82. EASTERBROOK & FISCHEL, *supra* note 6, at 36. There is also the somewhat disingenuous statement that “If a corporation undertakes never to leave a community, who can object.” *Id.* The authors declare that the contractual nature of a corporation renders questions regarding goals, contributions toward social welfare and charity, and profit maximization meaningless. “Our response to such questions is: Who cares?” *Id.* One might suggest to them that if the real world were a place where such undertakings were made, perhaps there would be no need for legal theories designed to justify the behavior.

83. *Id.* at 37-38. The problems of distributive justice and the allocation of entitlements is consciously left to the political process, however misguided that may be.

84. An attempt is made to display the range and variety of contemporary criticisms. Therefore, many creative ideas and observations of other critics are included and noted.

85. See Mitchell, *supra* note 49.

A. *The Search For and Belief in "Truth"*

Answers are comforting while uncertainty creates anxiety.⁸⁶ Human beings want to understand the "why?" of things. The attraction of "reason" is compelling. Truth may be discovered through inquiry and reasoning.⁸⁷ People seek truthful information about themselves, their communities, and the problems of living in society. Because conflicts exist at every turn, correct or "right" solutions to problems and conflicts are highly valued. Law is seen as one of the principle means of arriving at "right" answers.⁸⁸ The scholarly legal elite who have (or claim to have) answers to difficult problems are sought out, praised, and followed.⁸⁹ Persons claiming to know the truth are believed by many who seek it.

A clever riddle may be of interest. It is called the "Truth Teller Riddle," and it reads as follows:

In a strange and distant land, a foreigner was traveling to the fair. The road he traveled was unfamiliar to him. As he walked, he came to a fork in the road. His problem was to decide which of the two roads lead to the fair. At the fork in the road stood two local women. Each woman knew the way to the fair, and each knew that the other knew. One of the women was a "truth teller," meaning that she always told the truth. The other was a "lie teller," and she always answered falsely. The truth teller knew that the other woman was a liar, and the liar knew that her

86. For purposes of this discussion the level of "anxiety" need only reach that which is necessary to cause one to want correct information to facilitate better predictions of future outcomes and to seek out those persons who claim to have such knowledge.

87. See Ronald K.L. Collins & David M. Skover, Essay, *Commerce & Communication*, 71 TEX. L. REV. 697, 729-30 (1993) (noting that western civilization marked the Eighteenth Century as its "age of reason," a period of faith in human reason and a confidence in the supreme power of rationality to govern all aspects of life). Such luminaries as Francois Voltaire, Denis Diderot, Immanuel Kant and Sir Isaac Newton subscribed to the notion that the mind had a practically limitless capacity to find truth within a universe of information. *Id.*

88. Critical legal studies scholars, based mostly at Stanford and Harvard, argue that there are no standards for constraining judges or for determining whether a decision is correct as a matter of law. In fact, they celebrate this "indeterminacy" as a given of the legal process. Owen M. Fiss, *The Death of the Law?*, 72 CORNELL L. REV. 1, 1, 9 (1986).

89. All are, of course, subject to criticism as well. Leaders in law and academia, like other kinds of intellectual guides, attract a particular group of followers: like-minded people or those sympathetic with the assumptions or probable socio-political impact implicit in their ideas.

The great social and political developments of modern times, including the linking together of odd groups with seemingly disparate interests, is some evidence of the strength of leadership. The alignment of fundamentalist Christian groups and the conservative political agenda including the joining of the dichotomous ideas of pro-life (bringing with it a substantial Catholic group) and pro-death penalty is not only interesting but a possible result of aggressive leadership linking the two positions. Although this is certainly not a homogeneous group, and not all agenda items are embraced by all adherents to the general theme, it is remarkable how uniform the belief system appears.

companion always told the truth. The foreign traveler knew that one was a truth teller and that one was a liar, but he did not know which woman had which characteristic.

The traveler (under the rules of the riddle, which are always inviolate), in seeking directions to the fair, was entitled to ask only one question of only one of the women. The answer given to the question must allow him to correctly choose with certainty the road to the fair.

What is the question the traveler must ask?⁹⁰

Determining the answer to the riddle may take some thought. It depends absolutely upon the accuracy of the riddle's assumptions. Once one begins to solve the riddle, its assumptions must be taken as facts to be believed. The problem solver is no longer bothered by doubts concerning the completeness or accuracy of the assumptions, or any related issues.⁹¹

Law and Economics theory suffers from a similar problem. Once a question is identified (excluding all others) and assumptions are taken as true, the answers are generated as though compelled by mathematical equations and thus take on the aura of objective truth. People believe this truth perhaps because other possible answers have been eliminated by the framing of, or assumptions about, the questions. Question identification and assumption selection exclude other possibilities at such an early stage that their absence is no longer even noticed. The particular legal riddle may be solved, but the answers seem somehow narrow and unsatisfying. Of course, the answer is complete if the only goal is to get to the fair. Law and Economics fails us in determining worthy objectives.

90. The question (answer) is: "If I asked your companion for directions to the fair, which road would she tell me to follow"? The foreign traveler knew that either woman would tell him to follow the "wrong" road, so he would choose the other (correct) road. This is so because, if the traveler happened to inquire of the truth teller, she would name the wrong road because she knows that the liar (whose answer she has been asked to predict) will lie and give false directions. If the traveler happened to question the liar, she would also name the wrong road, because she knows that the truth teller would select the correct road, but the liar will then lie about that fact.

91. Since people are not all alike, and indeed no two people are exactly alike, it would be inappropriate to assume any particular set of reactions to this riddle. However, in numerous tellings of the riddle to individuals and groups, some anecdotal data exist. For example, everyone assumes that there is an answer to the riddle that makes sense and that (except for the faint hearted), if they try hard enough, they can discover it. No one has yet challenged the assumptions that the truth-teller *always* tells the truth and that the compulsive liar *always* tells lies. This seems odd in a world where, I suspect, no such real individuals exist. No one asks where the traveler was from or why he was going to the fair. Nor is there any interest in the women, except for their information. Why do they have these strange characteristics? Why were they standing by the fork in the road? Could a payment by the traveler induce change in their behavior? Did they customarily charge people for directions? What kind of "man" is this who actually "asks for directions"? Is it safe to be traveling alone? Is there really only one road to the fair, and if so, why? Do these people have names and families? Why didn't we care enough to ask? Why were these odd characteristics ascribed to women, labeling them as perfect truth teller or wholly bad compulsive liar? Why was it the "man" who got the job of figuring out the difficult problem?

Of course, it is just a riddle.

B. The Dangers of Adopted Science

1. Lawyers and Economics

Lawyers, judges and law professors who look to economic analysis of law as the best hope of solving difficult legal problems are dealing with a science in which few have significant education or expertise.⁹² Nevertheless, they seriously analyze, explain, and rearrange the law in accordance with economic principles. The attraction of lawyers to economics cannot be denied. Economics appears in hundreds of law review articles⁹³ and many judicial opinions.⁹⁴

Why is it that lawyers believe, with such apparent confidence, that economic analysis of law requires no particular education or training? Why is the application of micro-economics (alone among the "sciences") to law thought to be something lawyers can do?

Most lawyers do not practice medicine or apply medical principles, except to learn the bare essentials and terminology necessary for personal injury and medical malpractice cases. Most lawyers do not apply the principles attending mechanical, electrical, or nuclear engineering, physics or sophisticated computer

92. See SCOTT & NIGRO, *supra* note 54, at 9 (describing the discipline of economics as one of several recognized social sciences, and extolling it as the social science that most nearly approaches, in rigor and content, the physical sciences); see also POSNER, *supra* note 38, at 63 (comparing law and engineering with economics, and concluding that economics is a science). Both the author and Posner acknowledge that judges are not trained in economics, do not justify their decisions in those terms, and do not appear to think about such matters. Fiss, *supra* note 88, at 3; see also, Richard A. Posner, *Some Uses and Abuses of Economics in Law*, 46 U. CHI. L. REV. 281, 300 (1979) (describing Judge Sneed's efforts in the *Union Oil Co. v. Oppen* opinion to articulate his reasoning in economic terms as "disastrous"). At a later point in his career, however, Posner also suggests that knowledge of economics is not the important thing with respect to judges' behavior; it is that they behave "as if" they are trying to maximize the satisfaction of preferences even though it might be assumed that they never think in terms of wealth maximization, economics, or anything else for that matter. Fiss, *supra* note 88, at 3 (citing Richard A. Posner, *Wealth Maximization and Judicial Decisionmaking*, 4 INT'L REV. L. & ECON. 131 (1984)); see also POSNER, *supra* note 38, at 373 (admonishing the reader to "be no more surprised that judges talk in different terms while doing economics than that businessmen equate marginal cost to marginal revenue without using the terms and often without knowing what they mean").

93. A Westlaw electronic database search reveals that during the past five years more than two thousand articles dealing with some aspect of economics and its application to the law have been added. Since this is not an exhaustive list, it can be reasonably assumed that the actual number of articles published on this subject is substantially higher. Search of Westlaw, JLR Database (June 22, 1994) (search for articles containing the phrase "law and economics" published after 1989).

94. See, e.g., *Levinson v. Basic, Inc.*, 871 F.2d 562, 563-64 (6th Cir. 1989) (adopting the "efficient capital market" theory to eliminate the need for plaintiffs to show reliance in 10b-5 cases). The market, so the theory goes, reflects all public information in stock prices. Therefore, the harm done to investors is actionable even though the investors did not specifically rely upon a misrepresentation or omission of material fact. *Id.* See also *Wisconsin Knifeworks v. National Metal Crafters*, 781 F.2d 1280, 1284-89 (7th Cir. 1986) (presenting the debate between Posner and Easterbrook over the meaning of UCC 2-209 (2) and (4)); Richard A. Posner, *Wealth Maximization and Judicial Decisionmaking*, 4 INT'L REV. L. & ECON. 131, 132-33 (1984) (discussing how judges should be guided by the goal of wealth-maximization to make the pie as large as possible without regard to distribution of wealth).

science.⁹⁵ The percentage of law students having an undergraduate major in economics continues to be small.⁹⁶ The undergraduate preparation of the vast majority of students continues to be in the other social sciences like sociology, psychology, political science, anthropology, history, English, languages, fine arts, art history, business administration, accounting, and law enforcement.⁹⁷ Many of these varied educational experiences have for decades been considered to be excellent preparation for law school education. However, they are not science and moreover, they are not economics.

2. Lawyers Embrace What Economists Reject

Ronald Coase laments the current state of economics and criticizes modern economists as too dependent upon mathematical formulas and “black board” solutions.⁹⁸ Economics should be, according to Coase, more inclined toward theory based upon sound empirical studies. Nevertheless, Coase’s ideas, including his theory of the firm and his description of social costs (externalities) have not been well received by the economics community. Indeed, one of Coase’s main concerns, expressed in his 1988 book, is that his ideas have been ignored or rejected by other respected economics scholars.⁹⁹

95. In fact there is considerable anecdotal evidence that law students, and thus probably lawyers, are not proficient in complex mathematics. A typical student comment is, “If I could do math, I wouldn’t be in law school.” Even a casual observation of student attempts at calculating the number of shares needed by a shareholder to elect a director to a corporation’s board, using cumulative voting, gives one pause.

96. Letter from Robert A. Carr, Director-Data Services, Law School Admission Services, to Professor Robert C. Downs, University of Missouri-Kansas City School of Law (May 2, 1994) (copy on file with the *Pacific Law Journal*). Recent data suggests there has not been a dramatic infusion of undergraduate economists into the law school student population over the past few years. For the 1988-89 school year there were 87,288 applicants to at least one ABA approved law school, and only 5,041 (5.8%) were economics majors. *Id.* For the 1992-93 school year there was a national pool of 91,892 applicants to at least one ABA approved law school while only 4,562 (4.9%) were economics majors. *Id.*

This same trend is also evident among students actually enrolled in an ABA approved law school. During the 1988-89 school year there were 42,475 students enrolled. Of those only 2,777 (6.5%) had an undergraduate degree in economics. *Id.* In 1992-93 there were 42,996 students enrolled with only 2,444 (5.7%) classified as economics majors. *Id.*

Regardless of which set of numbers are used, each set indicates that the number of economics majors attending law school is declining both in a real sense and as a percentage of the total law school student population.

97. For example, the entering class of first year law students at University of Missouri-Kansas City Law School, in the fall of 1993, had 50 different undergraduate majors. Approximately 6% held undergraduate degrees in economics.

98. COASE, *supra* note 5, at 19.

99. See COASE, *supra* note 5, at 1. One of these is the world-class scholar and Nobel Prize winner Paul A. Samuelson. Paul A. Samuelson was born in 1915 in Gary, Indiana, and moved to Chicago with his family a few years later. Samuelson received his undergraduate education at the University of Chicago, receiving a B.A. in 1935. He went to Harvard where he earned his Masters in 1936 and his Doctorate in 1941. He accepted an assistant professorship at the Massachusetts Institute of Technology in 1940, moved quickly through the academic ranks, and has maintained faculty status there ever since. He was awarded the Nobel Prize in economic sciences in 1970 for his many publishing accomplishments. They consist of hundreds of titles,

Even though shunned by members of his own discipline, Coase found a bright and influential following in legal academia. One might well inquire as to why this happened. Why are lawyers attracted to Coasian-style economic analysis?¹⁰⁰ Perhaps it is precisely because, as Coase himself claims, it is so apparently simple. The central principles are easily stated and relatively easily applied. There is nothing terribly difficult about the concept of "transaction costs." The real conflict among economics scholars has been over whether this concept actually provides the answers claimed for it by Coase.¹⁰¹ Members of the legal profession have ignored the substantive debate over the essential correctness of Coase's claims. Perhaps this is because lawyers, judges, and law professors are, for the most part, unable to fully understand or significantly contribute to that debate. It is also possible, of course, that they have a vested interest in arguing one side or the other rather than determining the substantive value of any particular view.

Perhaps law professors were first attracted to Coasian economics because of its similarity to the manner in which traditional legal analysis was then conducted. Solutions to legal problems, in law schools at least, were discovered by "clear thinking." Broad policy concerns and individual interests were routinely balanced against one another to divine the proper rule of law.¹⁰² This process was done for the most part in the absence of empirical evidence. The interests and concerns were identified by thinking and reasoning about the problem, not by scientific

presently gathered in four volumes, with the expectation that many more will be added. Unlike many academic economists who devote their careers to the pursuit of one major idea or group of ideas within one narrow branch of economics, Samuelson worked with the entire spectrum of economic theory, using the language of mathematics as a tool for examination. The result is that he is not associated with a breakthrough in one particular area of economics, but almost any search of economic literature will reveal contributions to the discussion by Samuelson. BERNARD S. KATZ, NOBEL LAUREATES IN ECONOMIC SCIENCES 240 (1989).

100. See Schwab, *supra* note 14, at 1191-98 (making some non-polemical and interesting observations, and speculating about the odd receptivity of economic analysis to legal academics); *id.* (suggesting that, among other things, timing, the vacuum in jurisprudence following legal realism, and political inclinations may have been contributing factors).

101. See PAUL A. SAMUELSON, *The Monopolistic Competition Revolution*, in THE COLLECTED SCIENTIFIC PAPERS OF PAUL A. SAMUELSON 18, 35 (Robert C. Morton, ed. 1972) (advancing the notion that even given the existence of "the most idealized game-theoretic situation, rational self-interest does not necessitate that there will embrace a Pareto-optimal solution that maximizes the sum of two opponents' profits, in advance of and without regard to how that maximized profit is to be divided up among them") (emphasis in original); see also Schwab, *supra* note 14, at 1174-78 (citing to Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1 (1982)). According to Schwab, Cooter is even more direct than Samuelson in criticizing Coase. Even with zero transaction costs, says Cooter, bluffs, threats and other strategies to get a larger share of the gains of trade may prevent the parties from trading at all. Cooter suggests a Hobbesian Theorem as a "polar opposite to the Coase theorem: Parties will always carry out their worst threats and never reach efficient bargains, unless a Leviathan controls the strategic behavior." *Id.*

102. Lawyers who first experienced the subject of torts in a traditionally taught class will certainly remember the seemingly unending Socratic questions (in the author's experience put by Professor Dale Broader, himself a University of Chicago Law School graduate) as the professor sought to encourage the new law students to "think up" the interests that should be balanced, and the arguments that could be marshaled in favor of tilting the balance one way or another.

inquiry or testing. But answers thus derived may appear unsatisfactory. It is not certain that all appropriate interests have been included or properly weighed in the balance. The process is fraught with uncertainty and generates considerable anxiety. Whatever the merits or shortcomings of a traditional and insular system may be, the similarity to what Coase offered is unmistakable. Starting with first principles—the standard economics set, plus “transaction costs”—which seem to remove some of the uncertainty, the exercise is well suited to problem solving in the classroom or in the arm chair. The difference that made Coase popular is that he introduced other interests and concerns into the balancing act, and nearly guaranteed that the derived answers would be more certain and therefore more satisfying. Of course, the new assumptions and conclusions were consistent with majoritarian conservative ideology.¹⁰³ Theories which provide answers that are certain, reasonably defensible, and supportive of an existing ideology are bound to draw a crowd.¹⁰⁴ What is surprising is that the early crowd was so small: a few young men who taught law at the University of Chicago.¹⁰⁵

3. Coase and His Lighthouse

Coase decries the lack of empirical inquiry among economists, and applauds the efforts in the legal community to find out how things actually work.¹⁰⁶ But as scholars in the other social sciences have accurately pointed out, law schools have never been heavily involved in empirical research, nor very receptive to the

103. See Johnson, *supra* note 9.

104. But see Mitchell, *supra* note 49, at 241-42 (expressing feelings of emptiness about the Coase theory and wonderment that Easterbrook and Fischel have used it so successfully to build their own academic careers).

105. Among these young men were Richard A. Posner, Frank H. Easterbrook and Daniel R. Fischel. It was approximately seven years after his 1962 graduation from Harvard Law School that Posner began publishing law review articles with economic overtones. See, e.g., Richard A. Posner, *Natural Monopoly and Its Regulation*, 21 STAN. L. REV. 548 (1969); *Oligopoly and the Antitrust Laws: A Suggested Approach*, 21 STAN. L. REV. 1562 (1969).

Easterbrook began publishing approximately seven years after his graduation from the University of Chicago Law School in 1973, first collaborating with Posner and William M. Landes. See Easterbrook, et al., *Contribution Among Anti-Trust Defendants: A Legal and Economic Analysis*, 23 J.L. & ECON. 331 (1980).

Fischel's publishing endeavors in the field of Law and Economics began shortly after he received his law degree from the University of Chicago in 1977. See, e.g., Daniel R. Fischel, *Antitrust Liability for Attempts to Influence Government Action: The Basis and Limits of the Noerr-Pennington Doctrine*, 45 U. CHI. L. REV. 80 (1977); see also EASTERBROOK & FISCHEL, *supra* note 6.

106. COASE, *supra* note 5, at 28.

empiricism of others.¹⁰⁷ Legal scholarship has been criticized as insular, self justifying, and inadequate.¹⁰⁸

In criticizing the work of other economists, Coase makes much of the well known "lighthouse" example.¹⁰⁹ Coase shows that contrary to popular belief, lighthouses were once built and operated by private owners and not by governmental agencies.¹¹⁰ Thus, the well-worn example of an "essential" government service was demonstrated to be wrong. Coase's point was not really about lighthouses, although he spent many pages discussing the industry, but about the failure of scholars to do the necessary empirical research to understand the businesses they purported to explain. This is surely a valid criticism. It would seem that a comparable point could be made about lawyers practicing economic analysis without fully understanding the business of economics. Of course, Coase did not make the latter point.

Coase's criticism of the methods and techniques of inquiry used by legal academicians, however, suffers from the very fault he identifies. In his historical narrative describing the emergence, development and maturation of the lighthouse industry in England, Coase leaves out the kind of information that would make the empirical inquiry useful to his economic analysis. In making the point that the assumptions of others were wrong, Coase notes that the industry started out as private enterprise and was later changed into a governmental enterprise. Other than instances of destruction by storms and high waters, none of his information

107. The usual explanation for the dearth of empirical inquiry in law schools is "shortage of funding." It may also be true that law professors are seldom educated in the techniques and statistical methodologies necessary to the effort. Also, it is perhaps easier, and certainly faster, to write a law review article based on existing cases and other scholarly works. See Mark Cooney, *Why is Economic Analysis So Appealing to Law Professors?*, 45 STAN. L. REV. 2211, 2218 (1993) (book review) (observing that "legal scholarship provides relatively few examples of systematic empirical inquiry." Instead legal scholars have generally chosen to ignore "actual social interaction"); see also Nancy Levit, *Listening to Tribal Legends: An Essay on Law and the Scientific Method*, 58 FORDHAM L. REV. 263, 280 (1989) (stating that some of the current skepticism regarding the current use of empiricism can be directly attributed to the legal realists of an earlier generation who demanded far more of the social science tools of the time than those tools could provide). "[T]he role envisioned for empirical research in solving pressing legal issues far surpassed the boundaries of empirically verifiable phenomena. [Consequently, these inadequacies lead to] a misuse of empiricism and disillusionment with the goals of the realist movement." *Id.*

108. See generally Richard A. Posner, *The Deprofessionalization of Legal Teaching and Scholarship*, 91 MICH. L. REV. 1921 (1993).

109. The "lighthouse" has traditionally been cited by proponents of welfare economics as the prime example of an enterprise that requires government intervention and regulation, since seafaring ship owners cannot be identified and called upon to pay the costs of construction, maintenance, and operation of the life-saving (and obviously desirable) facilities. See 3 JOHN STUART MILL, *Principles of Political Economy*, in COLLECTED WORKS OF JOHN STUART MILL 968 (J.M. Robson ed., 1965); HENRY SIDGWICK, *THE PRINCIPLES OF POLITICAL ECONOMY* 406 (3d ed. 1901).

110. Scholars who used the lighthouse example assumed, incorrectly, that lighthouses were always a government-provided service. Coase, in his article, *The Lighthouse in Economics*, traced the history and development of lighthouses on the coast of England, and found that until relatively recently (1842), lighthouses were run, at least in part, by private enterprises. R.H. Coase, *The Lighthouse in Economics*, 17 J.L. & ECON. 357, 362-72 (1974).

or data discloses what kinds of problems the lighthouse industry experienced or what kinds of ownership and management schemes were more successful than others. No inquiry is made of the ship owners and sailors who relied on the lighthouses with respect to how the business actually worked in the real world. Furthermore, there is no data about success or failure in warning ships at risk. Certainly, Coase is entitled to place limits around his own level of inquiry. Perhaps he was only interested in an historical study or was not able to spend further time or resources on this project. What does seem to be inappropriate, however, is the claim that this particular study is an example of how empirical studies should be conducted.¹¹¹

4. Coase and Chaos Theory

Non-scientists believe in science. Certainly in the United States, where space shuttles, home computers, interactive television, solar heating, and nuclear power are familiar terms to average teenagers, science is commonplace. People depend on science and technology to solve serious problems. The scientific method has captured the hearts, minds, and future of humanity. There is a common belief that science can solve the world's problems.¹¹² But is it so?¹¹³

Science is better at some things than others. The physical sciences, including mathematics, are highly successful at describing, measuring, predicting and evaluating the parts of nature which can be described by relatively simple mathematical models. Natural laws of physics that can be described by mathematical equation, such as gravity, gas expansion, movement of mass, are generally considered to be susceptible to mathematical solution. These laws may be described by linear equations. Linear equations yield solutions.¹¹⁴ However,

111. COASE, *supra* note 5, at 5-7; *see id.* (chiding mainstream microeconomists for a lack of interest in such things as what firms do and for their assumption within the context of prevailing economic theory that transaction costs are nonexistent, while at the same time congratulating himself for taking notice of the empirical aspects of economics).

Given the rigor and sophistication (in terms of design, execution and statistical measurement and evaluation) of modern empirical studies in other disciplines, it is doubtful that any competent investigators in sociology, psychology, anthropology or any other soft or hard science would find Coase's "study" very helpful or acceptable. *See generally* JAMES FEIBLEMAN, SCIENTIFIC METHOD: THE HYPOTHETICO-EXPERIMENTAL LABORATORY PROCEDURE OF THE PHYSICAL SCIENCES 26 (1972); Levit, *supra* note 108.

112. POSNER, *supra* note 38, at 62; *see id.* (stating that "the scientific method is for most people in modern society the model of objective inquiry—such has been the success of science in altering both our world view and our world").

113. *See, e.g.,* DANIEL QUINN, ISHMAEL (1992). Not all observers are as confident about, or oblivious to, the seemingly intractable problems of environmental degradation, resource exhaustion, over-population, hunger, and other problems which test society in ever more serious proportions.

114. Even this orderly view of the world rapidly collapses when we realize that orbital mechanics present the insoluble "3-body" problem. The laws of gravity permit a scientist to determine the orbit of one body, for example the Earth, around one other body, for example the Sun, with exact certainty. But, with the addition of a third body, for example the Moon, the equations describing the orbits cannot be solved without

there is another quite different field of science which seeks to understand the aspects of the world which are non-linear. Those systems which appear to be random and uncontrollable, like the weather and the stock markets, are the subject of study by scientists under the modern theory called "Chaos Theory."¹¹⁵ One goal of chaos theory is to discover underlying patterns of behavior in seemingly random occurrences. The theory offers both a hope for better knowledge and a warning that knowledge is always incomplete.¹¹⁶ Michael Crichton described the idea in his contemporary and popular novel, *Jurassic Park*:

Chaos theory says two things. First, that complex systems like weather have an underlying order. Second, the reverse of that—that simple systems can produce complex behavior. For example, pool balls. You hit a pool ball, and it starts to carom off the sides of the table. In theory, that's a fairly simple system, almost a Newtonian system. Since you can know the force imparted to the ball, and the mass of the ball, and you can calculate the angles at which it will strike the walls, you can predict the future behavior of the ball. In theory, you could predict the behavior of the ball far into the future, as it keeps bouncing from side to side. You could predict where it will end up three hours from now, in theory. . . .

But in fact, it turns out you can't predict more than a few seconds into the future. Because almost immediately very small effects—imperfections in the surface of the ball, tiny indentations in the wood of the table—start to make a difference. And it doesn't take long before they overpower your careful calculations. So it turns out that this simple system of a pool ball on a table has unpredictable behavior.¹¹⁷

approximations. Chaos and "Science of Wholeness" theorists point to this problem as revealing the inadequacies of the "reductionist" science of Isaac Newton and his innumerable followers. *E.g.*, JOHN BRIGGS & F. DAVID PEAT, *TURBULENT MIRROR* 27 (1989).

115. See J. GLEICK, *CHAOS: MAKING A NEW SCIENCE* (1987). The theory has currently made its way into the common experience. For an accessible introduction to chaos theory, see MICHAEL CRICHTON, *JURASSIC PARK* (1990).

116. See, *e.g.*, JACK COHEN & IAN STEWART, *THE COLLAPSE OF CHAOS: DISCOVERING SIMPLICITY IN A COMPLEX WORLD* 44-45 (1994) (describing how Heisenberg's Uncertainty Principle prevents physicists from making measurements of the position *and* speed of a subatomic particle without losing information about one or the other measurement).

117. CRICHTON, *supra* note 115, at 75. Crichton is correct that the path of the ball will be somewhat unpredictable due to the potential errors he notes, but his example raises more of an "accuracy" than a "chaos" problem. There are two overlapping types of systems in which the error can grow chaotically: non-linear systems and systems involving positive feedback. *E.g.*, GLEICK, *supra* note 115, at 166-68. In both of these systems the error in the state at one point in time is multiplied in the next point in time. For such a system, Chaos Theory suggests a more insurmountable problem than mere lack of accuracy: Anything less than infinite accuracy in the modeling will eventually produce not just errors but a radically different outcome. Since infinite accuracy is impossible, prediction is precluded.

The example of the billiard ball taking a trip around the table is essentially one without feedback or

Chaos theory grew out of attempts in the 1960s to create computer models which would predict the weather. The physics of turbulent events such as wind, heat, and ocean currents, could not be described or solved by linear equations. Chaos theory sought to find patterns or conditions which would be predictors of future events. One of the problems related to predicting future conditions involving turbulent events is that the future is extremely sensitive to and dependent upon initial conditions. For example, the flapping of wings by a single butterfly on the other side of the world may affect future local weather. This sensitivity, referred to as the "butterfly effect," suggests that the nature and quantity of variables which affect the outcome sought to be predicted is so vast as to be utterly incalculable.¹¹⁸ There is simply no way, even given the remarkable capabilities of modern computers, to predict outcomes of turbulent systems. Western attitudes toward science include a belief that total understanding, and perhaps control, of nature is possible; given enough theory, knowledge, and data, answers can be derived that are correct. Chaos theory says this is not so. Chaos theory says that one can *never* know enough about certain systems—especially turbulent systems—to predict answers.¹¹⁹

Human behavior appears to be a turbulent system.¹²⁰ The vagaries of human beliefs, attitudes, emotions, goals, etc., seem much more akin to the variables involved in weather prediction than to those of chemistry and physics. The obviously turbulent, unpredictably variable, and marvelously unique ways in which human beings respond to their environment and its broad spectrum of stimuli, are arguably the essence of chaos. It is not clear why some children grow

substantial non-linearity. It would become a chaotic system with the addition of a series of "shots" by the billiard player producing feedback, or by adding more balls or pockets. Either of these additions will add non-linearity. With these complications, the slightly unpredictable vector of the cue ball will produce vectors in the other balls of greater unpredictability. This will in turn affect the action of the player on his next shot, and then affect the next vector of the cue ball. This leads to the wildly unpredictable situations inherent in the game of pool.

118. GLEICK, *supra* note 115, at 15-18; BRIGGS & PEAT, *supra* note 114, at 68-69. The "butterfly effect" was noticed and named by weather researcher Edward Lorenz, who had developed a relatively simple model of the Earth's atmosphere involving just three equations. These equations were iterative. That is, the equations were repeatedly solved and the result from each solution of the equations was based in part on the previous solution of the equation, hence, a form of feedback. In repeating a simulation of the Earth's atmosphere, Lorenz started at a midpoint in the simulation, typing in the results from the last solution for use in the next iteration. When he did this he dropped the lower decimal places of the results, expecting at worst that there would be a small loss of accuracy in replicating the previous simulation. Instead, he found that his model eventually predicted a completely different weather pattern. The tiny differences were magnified by the iterative processing.

119. Chaos theory also says that simplification of the system, the approach of the "reductionist" scientists, will not help us to make predictions because chaos can exist in very simple systems as long as there is some non-linearity or feedback. See BRIGGS & PEAT, *supra* note 114, at 96-103 (illustrating how the simple iterative equation, $Z_{n+1} = Z_n^2 + C$, where Z is a variable complex number and C is a fixed complex number, produces the infinitely intricate fractal images known as the Mandelbrot set).

120. See Schwab, *supra* note 14, at 1191 (asserting that the system of law and human behavior involves feedback).

up to be kind, gentle, giving adults while others (perhaps from the same family) seem filled with hatred and anger and for whom drugs, alcohol, and crime seem appropriate choices. It is known that a multitude of influences affect individuals at every stage of development. Not all of those influences have been identified, nor has it been determined how they might be controlled to produce better human beings. It would seem that if there is anything on this earth which is truly inexplicable, it is human behavior. Thus, it would also seem that human behavior is a subject particularly unsuited to over-generalized theories and simplistic assumptions such as those set forth in law and economics theory.¹²¹

Of course it is inappropriate to suggest the current or ultimate defeat of the social sciences by chaos theory. These sciences, through theory and empirical inquiry, add to the body of knowledge regarding human behavior. Indeed the call by the law and economics proponents for more empirical study is laudable if intended to increase knowledge about the nature and causes of human behavior. The warning sounded here, however, is that even after the effort is properly made, and what can be known is known, chaos will in the end prevail because the variables cannot be controlled. Butterflies will flap their wings whether humans will it or know it.

An example of how difficult it is to "know" how human beings will behave and how inappropriate it seems to make rules based upon such assumed "knowing" is Posner's suggestion about the probable effects of a rule of enforceability upon the value of charitable gifts. The question is whether there should be a contract rule of law that promises of future charitable gifts are enforceable by the donee. Such gratuitous promises have been deemed to be unenforceable due to a lack of bargained-for consideration. In his analysis of the question, Posner concludes that such promises should probably be enforceable because a rule of enforceability adds value to the transaction.¹²² In following traditional economic analysis principles, Posner asserts that the enforceability rule should prevail if it is efficient, and that it is efficient if a benefit will accrue to one party without any harm to the other party.¹²³ To find a "benefit" to the donee resulting from a rule of gift enforceability, Posner uses a present value analysis to note that the value of a future gift is worth less to the donee if the gift is not legally enforceable. That is, assuming financial ability of the donor, a donee who knows that the gift will be received will value that gift more than one which is unenforceable. Thus the gift has an enhanced value (which is efficient in theoretical terms) benefitting the donee without any harm to the donor. The value argument is very much like

121. See M. MITCHELL WALDROP, *COMPLEXITY: THE EMERGING SCIENCE AT THE EDGE OF ORDER AND CHAOS* 22 (1992) (describing Stanford economics professor William Brian Arthur's dissatisfaction that "[t]he mathematical economists had been so successful at turning their discipline into ersatz physics that they had leached their theories clean of all human frailty and passion").

122. Richard A. Posner, *Gratuitous Promises in Economics & Law*, 6 J. LEGAL STUD. 411 (1977).

123. *Id.*

a financial "present value" argument. The value of a dollar today is more than the present value of a dollar to be received some time in the future.

The conclusion is that it is efficient to permit enforcement of gratuitous promises; since there is an increased value to one party without harm to the other party, gratuitous promises "should" be enforceable. What is troubling about these assertions is that there are a number of "other" possibilities which seemingly have not been considered. For example, it is not known whether donees would, in real life, actually seek enforcement of the gift. Donees may be concerned that actual enforcement of any particular promise would be a disincentive to other potential donors and result in an overall reduction in giving. There is also the imponderable about how such litigation by charitable groups would impact the general attitude of the charity's employees, beneficiaries, and other constituencies. How would such behavior impact other parts of the community? Is a community which permits litigation to enforce voluntary gifts different from one which does not? Does this matter? How could society ever know? Is this another Chaos-theory butterfly at work?¹²⁴

Even when viewed as "merely" an exercise in the application of economic analysis, some of Posner's conclusions seem incorrect. His conclusion that no one will be harmed is not correct. His conclusion that the donee will be benefited by receiving more value in an enforceable gift is probably untrue. Thus his conclusion that the rule change is efficient is also wrong. The donor is in a worse situation. The donor loses the ability (right) to withdraw his promise or to make a smaller gift. This increased "cost" to the donor could result in a refusal to make any promise or a reduction in the amount of the gift. In either case, it is likely that this reduction in commitment by the donor will offset the asserted benefit to the donee gained by the enforceability rule. With these assumptions, the proposed change in the rule is not theoretically efficient because there is a harm to the donor and because there is no added value to the transaction since the benefit is offset by the harm. There is also, perhaps, an unmeasured and unaccounted for harm to the community, as well.

The same analysis can be applied to a change in the rule from enforceability to unenforceability. Economic analysis of the problem does not indicate which rule should be adopted or retained since both sides of the transaction could, and perhaps would, change their behavior to effectuate their desired outcome. At least, it is "assumed" that they would, or that most parties would. What is missing is some consideration of the effect either rule has on the general well being of the community. Whether society is better off with one rule instead of another is a question (which may be important) which does not seem to overly concern pro-

124. Could these reactions to the change in the rule produce chaotic and unpredictable increasing returns? See WALDROP, *supra* note 121, at 35-36 (describing how "increasing returns" caused the videotape industry to adopt the inferior VHS format as its standard because VHS had a tiny initial edge over Beta in market share).

ponents of economic analysis. Perhaps the absence of interest in such questions is due in part to the possibility that answers to such questions depend mostly upon judgment, politics, wisdom and other essentially non-economic factors.

5. Coase and Cooter¹²⁵

The risk involved in adopting simplistic explanations of how human beings behave is dramatically brought to light by Robert Cooter in his insightful article, *The Cost of Coase*.¹²⁶ Cooter observes that an essential assumption of the Coase Theorem is wrong. A standard formulation of the Coase Theorem, attributed by Cooter to Calabresi¹²⁷ is: "If one assumes rationality, no transaction costs, and no legal impediments to bargaining, *all* misallocation of resources would be fully cured in the market *by bargains*."¹²⁸

Cooter demonstrates that this assumption is contrary to general bargain theory and does not describe how human beings actually behave. To show that bargaining games with zero transaction costs do not necessarily reach efficient solutions, Cooter explains that "bargaining games" are neither purely distributive zero-sum exercises where one wins and the other loses (like poker), nor merely coordination games in which players win or lose as a team and where winning is mutually productive. Instead, bargaining is conducted under conditions of uncertainty with regard to both distribution and production. If production is to become possible (by agreement) then some method of distribution between the participants must also be agreed upon. Cooter points out that bargaining over the distribution of gains involves self-interested behavior. Behavior such as threats, bluffs, lies, and other noncooperative bargaining are inherent in the process. Thus, there is no reason to believe (or posit as Coase has done) that self-interested bargainers will agree about how to divide the stakes. Cooter thus concludes that Coase's assumption—the only impediment to bargaining for efficient outcomes is the transaction costs of bargaining—is wrong. The impediment to efficient allocation of resources is not transaction costs, but the real life vagaries of bargaining itself. Cooter also describes Hobbes' view of bargaining:

[T]he conception of law which is the polar opposite to Coase is articulated in Hobbes and is probably much older. It is based upon the belief that people will exercise their worst threats against each other

125. Robert Cooter is a Professor of Law, at the University of California at Berkeley, and has been the Olin Visiting Professor of Law and Economics at the University of Virginia. He holds advanced degrees in both law and economics. He is certainly an exception to the statement that "lawyers do not do economics."

126. Cooter, *supra* note 21.

127. See Guido Calabresi, *Transaction Costs, Resource Allocation, and Liability Rules—A Comment*, 11 J.L. & ECON. 67 (1968).

128. Cooter, *supra* note 21, at 16 (emphasis added).

unless there is a third party to coerce both of them. The third party for Hobbes is the prince or leviathan—we would say dictatorial government—who has unlimited power relative to the bargainers. Without his coercive threats, life would be “nasty, brutish, and short.”¹²⁹

Cooter describes Coase as overly optimistic about bargained outcomes and Hobbes as too pessimistic. In light of the likely ability of the parties to cooperate, he proposes that informed policy choices must balance the Coase Theorem against the Hobbes Theorem. Since inefficient outcomes are most likely when the players miscalculate and fail to anticipate the moves that others will make, the task becomes to describe a bargain theory which best describes how people actually bargain, but which still meets the requirements of the basic economic principles involved. His answer is to propose “a model in which bargainers’ strategic behavior *sometimes* results in noncooperative outcomes. . . . Non-cooperative outcomes occur because each player’s strategy is best against opponents on average, but not best against every individual opponent.”¹³⁰

Unfortunately, Cooter’s assumptions about the probability of miscalculation by others in bargaining have limited applicability. Cooter says:

The strategy chosen by a player depends upon his subjective probability distribution over his opponent’s strategy. It is necessary to specify the mechanism for forming expectations. There are various economic models for the formation of expectations, but the model which is entitled to be called the most fundamental is a model of “rational expectations.” This phrase means that expectations contain no systematic bias, that is, the subjective expectations correspond to the objective frequencies of the random event.¹³¹

A possible interpretation of Cooter’s idea is that what a bargainer believes the other party will do has some close relationship with what that other party usually does in similar circumstances. In Cooter’s words, “rational expectations are the result of a learning process by which bias is corrected.”¹³² The learning process to which Cooter is referring is “experience” in bargaining in certain settings. Specifically, bargainers will hire lawyers experienced in bargaining over the specific questions with specific opponents. Trial and error with various approaches and tactics will gradually eliminate the systematic bias, and cause the

129. *Id.* at 18.

130. *Id.* at 28 (emphasis added).

131. *Id.* at 21-22.

132. *Id.* at 22.

bargainer (through its lawyer) to "rationally expect" certain behavior from the other side which is actually likely to occur.¹³³

Cooter, for all his brilliance in both law and economics, falls victim to the same errors he attributes to both Coase and Hobbes: a personal belief about how people behave.¹³⁴ The world probably does not operate the way he thinks it does. In order for his "rational expectations" model to work, these special negotiating lawyers must be very unique indeed. Not only must they continuously repeat their performances in a particular setting, but they must do so with the same or very similar opponents. The idea is to learn which tactics work and which ones fail, and to thus get "good" at being right about how the other side will react to particular proposals or actions.¹³⁵

The literature on negotiating strategy and tactics takes quite a different approach.¹³⁶ The emphasis is on negotiating as "an art." Preparation, judgment, self-analysis, and personal qualities of patience and perseverance are stressed. There is not much science and not much belief in learning how to out-negotiate someone by numerous repeat performances. In the real world, truly repeat performances are very rare. Things are never quite the same. There are always new variables. Cooter is correct in his suggestion that each party will be balancing the probability of getting a better deal against the possibility of getting no deal at all, but his "rational expectations" model will not help either party eliminate the risks inherent in that balancing process. Each party will still challenge, bluff, and perhaps threaten a "no deal" outcome, without "knowing" what will happen next.

These realities are also relevant to a similar assertion made by Easterbrook and Fischel that people will always agree to make the pie bigger no matter how the pie is to be divided.¹³⁷ Coase would say, "of course the parties will agree;"

133. Cooter, *supra* note 21, at 22.

134. See *id.* at 28 (noting, in his customarily finely-turned phrasing, "[t]he Coase Theorem and the Hobbes Theorem are *illuminating falsehoods*") (emphasis added). It also should be noticed that Cooter's facility with the mathematical economics of formulas and proofs far surpasses the abilities and understanding of most members of his audience. His five page Appendix of "proofs" and other economics formulas would, even without graphs representing these formulaic concepts, be incomprehensible to most lawyers, judges, and law professors.

135. In falsely hoping that negotiators can learn enough about their opponents to predict their reactions and various negotiation strategies, one might just hear the faint echo of Chaos Theory. See WALDROP, *supra* note 121, at 151 (comparing the supposedly rational agent to a chess player and asking, "[h]ow do we make a science out of imperfectly smart agents exploring their way into an essentially infinite space of possibilities?"); *id.* at 250-52 (describing the bounded rationality problem with neoclassical economics and suggesting that the appropriate model is not perfect rationality, but rather an adaptive agent who makes mistakes yet attempts to follow a course that is profitable).

136. See, e.g., ARNOLD GERSTEIN, WIN-WIN APPROACHES TO CONFLICT RESOLUTION (1986); ROGER FISCHER, GETTING TO YES: NEGOTIATING AGREEMENT WITHOUT GIVING IN (2d ed. 1991); HERB COHEN, YOU CAN NEGOTIATE ANYTHING (1980).

137. See EASTERBROOK & FISCHEL, *supra* note 6, at 119. The authors ask if "investors prefer a legal rule creating a larger pie even if not every one may have a larger slice?" In response to their own question, the authors assert that "they do. . . ." *Id.*

Hobbes would see routine failure without coercion; and Cooter would find hope of regular agreement only if specially experienced lawyers did the job.¹³⁸

CONCLUSION

The proponents of economic analysis of law have aggressively advanced two essential propositions. The first idea is that economic principles (beginning with a list of necessary assumptions) accurately describe the manner in which human beings behave. The second notion is that positive law is already (in most instances) consistent with these economic principles. The call for further "empirical research" seems to be a call to find more examples and better evidence of these perceived truths. Adherents hold seminars and summer camps to "school" new converts and reaffirm the faithful. The appeal is beguiling. Scholars disenchanted with big government, insufficient justifications for existing rules, and blunt majoritarian political answers to legal problems are understandably curious and eager to understand these new truths. The brief history of the law and economics movement has a familiar and somewhat "religious" ring to it. Its evangelistic character (like the similarly enthusiastic and proselytizing efforts of early Critical Legal Studies proponents) is unmistakable. Many law professors have built their careers and polished their national reputations by advancing ever more intricate applications of economic analysis. New adherents seek to do the same. This is neither unexpected nor inappropriate. Scholarship is necessary and desirable. On the other hand, only a naive observer would expect the proponents of economic analysis of law to be the ones to identify and announce any important flaws in the basic theory.

There is danger, of course, in building theory upon theory unless the original essential primary principles and assumptions are correct. In vernacular terms, there is risk that new converts (mostly law professors) are too eagerly jumping on the proverbial bandwagon. The builders of the theoretical wheels of this bandwagon (the economists) are not so sure the wheels fit this wagon or that the wheels will not fall off. Scholars and others who seek answers that seem (for whatever reason) to be more appropriate solutions to legal problems are not so sure this bandwagon is going in the right direction.

Perhaps it is time for an increased and serious challenge to the simplistic assumptions of the "econo-lawyers" who view humanity as just self-seeking dust and money. After all, if all important human values can be reduced to supply and demand curves, and if only the changes "at the margins" count, and if all

138. This situation is reminiscent of the humorous television commercial, of a few years ago, in which James Garner was trying to describe the workings of an instant picture camera to Marriet Hartley. He described how it worked. She said it didn't work that way. He said, "Well, then, how does it work?" She said: "Some other way." To Coase, Cooter, Hobbes, Easterbrook and Fischel, we might say bargaining works "some other way."

preferences are to be measured in money and only those with money can vote their preferences, and if all factors such as fairness, justice, and equity are considered to be inherently accounted for by the market, why not just use computers as a substitute for courts? A finder of fact would still be necessary, but once the facts were known the answer would be obvious. The computer could perform the proper economic analysis and generate answers efficiently. There could be trouble, of course, if the computer started to "think" about the problems and consequences of particular answers. It might even announce that the only important answer is "42."¹³⁹

139. DOUGLAS ADAMS, *THE MORE THAN COMPLETE HITCHHIKER'S GUIDE* (1987); *see id.* (describing a fantastic computer, the biggest and best computer in the universe (named Deep Thought), which was asked to find the answer to the question: What is the meaning of life, the universe, and everything?); *id.* (noting that after 7 and ½ million years of computing—the long delay helped reduce self interested opposition to the revelation of such an important answer—Deep Thought reported that the answer was "42").