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Economic Models of Law: Introduction

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by

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(Editors)

Abstract: This introductory chapter to *Economic Models of Law* (forthcoming, Edward Elgar) discusses the use of economic models for understanding law. It also provides a survey of the contents of the volume, which consist of twenty-one previously published articles in the areas of torts, contracts, property, and legal process.

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Economic Models of Law

Introduction

by Thomas J. Miceli and Matthew J. Baker, editors

Assembling the papers to be included in this volume posed two distinct challenges to us as editors. The first was a conceptual issue raised by the question of what exactly constitutes an “economic model.” Does it mean any paradigm, founded in economic logic, that is meant to describe some particular aspect of the law and its effect on human behavior? Or does it specifically mean a *mathematical* model? Many early classics in law and economics (for example, Coase (1960), Calabresi (1961), and Calabresi and Melamed (1972)) include economic models of the former sort but are devoid of mathematics. However, current practice clearly involves the use of mathematical models, and we have followed that convention. The larger philosophical question of why law and economics has become so mathematical, and whether or not that is a good thing, are questions beyond the scope of this volume (and continue to be a source of debate in economics generally).

The second challenge we faced was to develop criteria for selecting papers, given that the scope of the volume was not naturally defined by a particular area of law. Instead, the organizing principle was the use of “models” (or, given the previous discussion, the use of “mathematical models”). Although this narrowed things somewhat, it still left most of the law and economics literature since at least the 1970’s. We further limited our scope by deciding not to actively attempt a broad coverage of the field of law and economics (though this arose as a fortuitous by-product of our efforts), or to select only “classic” papers, in the confidence that both of these objectives have already been fulfilled by the various specialized volumes in this

series. Rather, we took as our charge the assembly of a set of papers that we believe either reflect state-of-the-art modeling techniques, or are especially successful (or innovative) in explicating some particular legal issue or problem. The specific test we applied was to select papers that we would recommend to young scholars, both as illustrations of how to formulate interesting questions, and how to use effective modeling strategies to answer them. In some cases, this led us to select classic papers on a particular topic, but more frequently it did not, since pioneering work, as a mark of its influence, often inspires more effective follow-up treatments that improve on the original. (Indeed, that is what makes a work pioneering rather than an interesting dead end.) It is sad but true that some seminal papers are highly cited but rarely read; our goal was to assemble papers that *should* be read. Of course, there is much subjectivity and personal preference reflected in our choices, but we are nevertheless hopeful that the assembled papers will prove to be a both useful resource and an inspiration for the next generation of modelers.

In the remainder of this introduction, we offer some general comments on the nature of economics models in general, and on their application to legal issues. We conclude with an overview of the contents of this volume.

The Nature of Economic Models

Economics, as a social science, relies heavily on models, mostly mathematical, as a way of simplifying the world. Without models, it would be impossible to disentangle the myriad causal relationships that characterize a complex social system like the marketplace or the legal system. To be sure, there is a necessary sacrifice in reality when using a model to isolate a particular phenomenon, but the hope is that the factors that are excluded from the model are

extraneous to the particular question of interest, and so can be safely ignored, at least as a first approximation. The extent to which a model succeeds in this respect is an indication of whether it is a good or bad model. Economists use two basic approaches to assess the “goodness” of their models:¹ the first is to evaluate the quality of the assumptions, and the second is to use empirical evidence to test whether the model accurately predicts behavior.

As noted, the assumptions of an economic model define the specific relationships that will be studied and the factors that will be excluded from analysis—in other words, what variables are endogenous and what variables are exogenous. The validity, or quality, of the assumptions will determine how believable the conclusions of the model are, because once the assumptions are in place, the results follow logically. Thus, most of the debate over economic models involves questioning the assumptions: specifically, has the essence of the issue been captured, and are only inessential factors excluded? In many cases these are subjective questions, and so the skillful choice of assumptions is often characterized as an “art.”²

The second test of a model (some would argue the only relevant test)³ is whether it can predict or explain the real world. This is where theory meets empiricism; that is, where data (or other forms of empirical analysis, like case studies) are brought to bear in testing the predictions of a model. The current volume is concerned exclusively with theory, but good theory should always be developed with an eye toward making predictions that can be tested, for according to the scientific method, a model that fails the empirical test, no matter how elegant, should either be discarded as invalid, or revised.

Although economic models can vary widely in their specific techniques and methodologies (as the papers in this volume illustrate), they nearly always share certain

¹ Much of the discussion in this section is based on Nicholson and Snyder (2012, p. 3-9).

² See, for example, the essay by Landes (2005).

³ See, for example, the classic articulation of this view by Friedman (1953).

characteristics. First, they generally start by positing rationality on the part of the relevant decision-makers, at least some of the time. In other words, agents are assumed to act optimally to pursue their self-interest, however that is defined, subject to the constraints they face.⁴ Second, the setting in which agents act is limited by the assumptions of the model, which, as discussed above, allow the researcher to focus on the particular question(s) of interest. Finally, economic models distinguish between positive and normative analysis; that is, between analysis that is meant to describe or predict behavior in a particular institutional setting, and analysis that is meant to prescribe a better outcome or policy based on some articulated social norm (for example, efficiency, fairness, or justice). Economic analysis of law comes in both varieties, depending on whether it is meant to provide a rationale for, or understand the impact of, a particular legal rule, or whether its aim is to propose a better one.

Economic Models of Law

The application of economic analysis to law has a long history, dating back at least to the criminal law theories of Beccaria and Bentham. Surprisingly, however, the idea that laws could be interpreted as creating incentives for behavior did not seem to resurface again until the 1960s with the work of Coase (1960), Calabresi (1961), and Becker (1968). Since then, however, the application of law to economics has blossomed into a major field in both law and economics.⁵

Ironically, the first use of a mathematical model to explain the law was apparently by a judge in the famous case of *U.S. v. Carroll Towing*.⁶ In that case, Judge Learned Hand articulated his eponymous rule for determining negligence, which says that an injurer who fails

⁴ See the discussion of this assumption in Posner (2003, pp. 17-18).

⁵ See Posner (2005) for a discussion of the early history of the law and economics movement, and Mercuro and Medema (1997) for an overview of recent developments and perspectives.

⁶ 159 F.2d 169 (2nd Cir. 1947).

to take a particular precaution should be found negligent if $B < PL$, where B is the burden (or cost) of the precaution in question, P is the probability that failure to take the precaution results in an accident, and L is the loss from the accident. As Posner (1972) argued, when this formula is interpreted in its proper marginal form, it gives exactly the right answer regarding when precaution is efficient. Subsequent authors beginning with Brown (1973) characterized the injurer's problem as one of cost minimization and showed that the resulting first-order condition replicates the marginal Hand rule, with B as the marginal cost of precaution and PL as the marginal benefit. (In particular, the Hand rule, written as an inequality, says that additional precaution is efficient as long as the marginal cost is less than the marginal benefit.)

Another important insight that emerged from Brown's formalization of the accident problem was that, when care is bilateral—that is, when both the injurer and victim can influence accident risk—a negligence rule can simultaneously create incentives for the two parties to take efficient precaution. The way it accomplishes this (given the constraint that any damages assessed against the injurer must be paid to the victim) is by creating a threshold of behavior—the due standard of care—that shields injurers from liability as long as they meet the standard. Injurers thus have a strong incentive to do so to avoid liability, and because that leaves victims responsible for their own damages, they also have an incentive to be careful. The demonstration of this result, which required the derivation of a Nash equilibrium in a two-person, non-cooperative game, was one of the early triumphs of the use of mathematics for modeling law. The classic paper by Cooter (Chapter 1 in this volume) went on to use the insights from this analysis to illuminate doctrines in contract and property law as well.

This early work in tort law elaborating on the Hand rule, along with Becker's (1968) model of crime (which revived and formalized the insights of Beccaria and Bentham) and

Landes's (1971) model of the courts, really marked the beginnings of the use of mathematical models of law. The value of using models to study law, according to Steven Shavell, the leading practitioner of the approach, is that "they allow descriptive and normative questions to be answered in an unambiguous way, and that they may clarify understanding of the actual influence of legal rules on behavior and help in the making of legal policy decisions" (Shavell, 2004, p. 1).

Still, the application of economic analysis to law, and especially the use of sophisticated mathematical models, has not been without its critics. No less a person than Ronald Coase, one of the "founding fathers" of law and economics, questioned the practice as part of his more general critique of the expansion of economics to "contiguous disciplines" (Coase, 1978). Coase attributed this expansion to the view by some economists (Gary Becker being a prominent exemplar) that the methodology of economics lends itself to the study of any social phenomena, based on the assumption that people behave rationally most of the time, whether they are making explicitly economic decisions or are acting in some other arena (like the legal one). In other words, Coase argued that the generality of the economist's "analytical systems...facilitated the movement of economists into the other social sciences" (Coase, 1978, p. 207).

He nevertheless predicted that the predominance of economics in these other disciplines, based on this methodological comparative advantage, would be temporary because practitioners in those disciplines, once they recognized the value of the economic approach, would begin to make use of it themselves, and, in conjunction with their specialized knowledge of the field, to

re-assert their dominion over it. At that point, Coase argued, economists would lose their comparative advantage.⁷

Thirty-five years later, we can concede that Coase's prediction has to some extent come true, since many young law and economics scholars now possess advanced degrees in both economics and law, thus undoubtedly giving them an advantage over scholars with only one of those degrees (which was the case with most of the first generation of law and economics scholars). But this development has not in any discernible way lessened the influence of the economic analysis of law; if anything it has expanded its reach by increasing the range of legal questions that creative scholars can study using economic models. Indeed, one might argue that the resulting synergy has given a renewed vitality to the field.

The Contents of this Volume

Rather than attempt a summary of the various papers contained in this volume, we will offer some remarks on how and why we selected them. While we opted to organize the volume around the usual subject areas – torts, contracts, property, crime, and the legal process – we also felt that the volume needed papers that served the broader purposes of unifying the subject matter and offering useful methodological approaches. To that end, the first two papers, by Robert Cooter and Donald Wittman, demonstrate the ability of economic models to unify disparate areas of law within a common theoretical framework. As noted above, Cooter's paper uses the "model of precaution," first developed by Brown (1973) in the context of accident law, to explain doctrines in torts, contracts, and property. Beyond that, the paper provides a lucid discussion of the tension between efficiency and equity present in many economic models of

⁷ Even when that happens, however, Coase noted that economists would still be able to study how the legal system affects the operation of the economic system. One notable manifestation of this prediction is the emergence of the sub-field of "development law and economics."

law. Wittman's paper also develops a model with a unifying theme, emphasizing problems of sequential choice and strategic interaction that often arise in legal contexts.

The papers in the section on tort law offer important extensions of Brown's seminal analysis. Steven Shavell illustrates the basic economics behind regulation and liability rules, and provides a justification for the intuitively pleasing notion that the two approaches to managing incentives are complementary. Additionally, the paper offers some practical hints for someone interested in modeling difficult-to-characterize issues like limited liability of injurers and policy-making uncertainty. A. Mitchell Polinsky and William Rogerson nest a model of liability in a standard market model and use the resulting framework to illustrate the impact of market structure and the accuracy of consumer risk perceptions on the optimal assignment of liability. Keith Hylton shows how to introduce litigation costs into a model of tort liability, while Kathryn Spier provides an interesting extension of the basic tort model to situations in which firms may find it optimal to buy back (i.e., voluntarily recall) a dangerous product from consumers rather than facing the threat of liability.

As is the case with tort law, the techniques employed in the early papers in the area of contract law were refined and rendered more amenable to adaptation and application in subsequent papers, such as that by Shavell (1980), which is now the canonical model of contract breach. The first contract paper included here, by Russell Cooper and Thomas Ross, seeks to explain the partial coverage afforded by product warranties based on the presence of a two-sided moral hazard problem when both sellers and consumers can affect the likelihood of product failure. The model is a nice illustration of the sort of fundamental insights that one can obtain from a relatively simple framework. Shavell examines the strategic aspects of the decision by contracting parties of whether or not to invest in information acquisition prior to executing a

contract. The paper examines the distinction, first drawn by Hirshleifer (1971), between privately and socially valuable information. Finally, the paper by Yeon-Koo Che and Tai-Yeong Chung reexamines the efficiency of standard breach remedies when contracting parties can make “cooperative investments” prior to trade, meaning investments that benefit their trading partner. The analysis shows how a small change in the standard breach model can have significant effects on the desirability of various breach remedies.

We have included the largest number of papers in the section on property. However, this decision is not necessarily meant to suggest that property law is a more important branch of law than the others; rather, it reflects the wide diversity of questions posed by property law, and the resulting diversity of modeling approaches. (Indeed, there is no canonical model of property law, as there is for tort law or contract breach.) The first three papers in this section all concern the establishment and transfer of ownership rights to property. Matthew Baker offers a positive description of the development and enforcement of ownership of land, while Dean Lueck discusses positive and normative aspects of the design of rules governing the initial allocation of property rights over a variety of assets. Baker and Thomas Miceli analyze the transfer of property rights through inheritance, and discuss the diversity of ways in which inheritance might occur. They also offer some empirical evidence for their conclusions.

The seminal paper on takings law by Lawrence Blume, Daniel Rubinfeld, and Perry Shapiro discusses governmental takings of land and the best rules for determining compensation for takings. This paper has engendered a large literature, most of it devoted to evaluating their controversial conclusion that paying any compensation for takings will often be inefficient owing to the moral hazard problem it creates for landowners. In one follow-up paper, Miceli and Kathleen Segerson examine the “compensation question” in the context of so-called “regulatory

takings,” or government regulations that reduce the value of land without actually acquiring title to it. In addition to offering insights into this confusing area of law, this paper shows how insights from the economics of tort law (especially the case of bilateral care accidents) can be profitably applied to a different legal context. The paper on optimal patents by Paul Klemperer illustrates how one might model the basic tradeoffs and investment incentives inherent in the protection of intellectual property rights. The paper specifically focuses on the interplay between patent length and patent breadth as alternative policy levers.

In the area of crime, Becker (1968) is the standard reference, but his modeling approach, while extremely influential, is not the one in common usage among researchers in the field today. The paper by Polinsky and Shavell surveys the state-of-the-art approach that most theorists now employ. And while we anticipate that even established scholars in the field will be unfamiliar with the paper by William Furlong, we believe that many useful insights can be gained from his general equilibrium approach to modeling crime and criminal deterrence. For example, his model allows the derivation of the apprehension function, which the standard Becker-Polinsky-Shavell model takes as given.

Our last group of papers concerns legal process. The first paper, by Jennifer Reinganum, develops an asymmetric information model of bargaining between a prosecutor and a criminal defendant prior to trial when defendants have private information about their guilt. The final two papers, by Barry Nalebuff and Avery Katz, also examine asymmetric information models of pre-trial bargaining, but in the context of civil litigation. While Bebchuk (1984) pioneered this now-standard approach to the settlement-trial choice, the Nalebuff and Katz papers extend his model in an important direction by explicitly dealing with the credibility of a plaintiff’s threat to take a case to trial if the defendant offers a zero settlement amount. The two papers are also interesting

from a methodological perspective because they offer alternative methods for structuring asymmetric information models of the settlement game.

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