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October 2011

Maturing into Normal Science: The Effect of Empirical Legal Studies on Law and Economics

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MATURING INTO NORMAL SCIENCE: THE EFFECT OF EMPIRICAL LEGAL STUDIES ON LAW AND ECONOMICS

*Robert Cooter**

Empirical legal studies (ELS), according to this Article, is the maturation of law and economics (L&E) into the long-awaited science of law. The main sociological consequence will be the gradual spread of ELS and L&E into the nonelite law schools. This process can only go so far because science concerns law's effects, whereas teaching at nonelite law schools concerns law's content. To learn law's content, pass the bar exam, and practice law, students need an intuitive understanding of law's effects. To move to the center of law teaching and practice, the next task of ELS is to make the correct interpretation of law depend significantly on its scientific consequences, not merely its intuitive consequences.

I. INTRODUCTION

Empirical Legal Studies (ELS), according to this Article, is the maturation of law and economics (L&E) into normal science. Together they constitute the long-awaited science of law. ELS facilitates the spread of L&E into the nonelite law schools. This process, however, cannot go very far because ELS and L&E concern law's effects, whereas teaching at nonelite law schools concerns law's contents. By learning law's contents, students can pass the bar exam and practice law, even though their understanding of law's effects remains intuitive and not scientific. To move to the center of law teaching and practice, the advance of ELS and L&E would have to make law's content depend more on its effects.

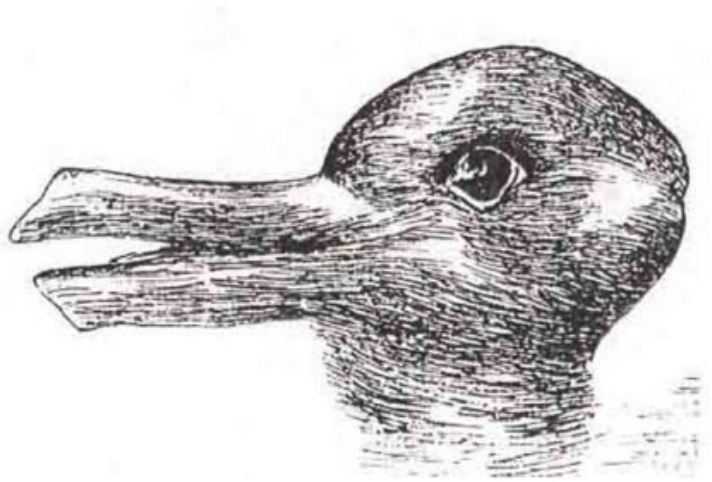
* Herman Selvin Professor of Law, Berkeley Law School. This Article was presented at a conference in honor of Tom Ulen, University of Illinois College of Law, on November 19–20, 2010. This Article draws heavily on joint research with Jody Krauss. *See* Robert D. Cooter & Jody S. Kraus, *The Measure of Law and Economics* (August 2010) (unpublished manuscript) (on file with author).

II. NORMAL SCIENCE

In his classic book, *The Structure of Scientific Revolutions*, Thomas Kuhn distinguished between normal and revolutionary science.[1] Normal science proceeds by incremental improvements. Hypotheses are deduced from current theory and then tested empirically—a process that is similar to sequencing a gene. Confirmation or disconfirmation prompts small adjustments in the theory. As normal science proceeds, unexplained anomalies accumulate. Resolving the anomalies requires a new theory at the science's core. Revolutionary science proceeds by abrupt jumps that rearrange the core's elements into an unfamiliar pattern, as with postulating the double helix in genetics.

Kuhn illustrated a scientific revolution by the duck/rabbit image in Figure 1. The viewer can see the image as a duck or a rabbit, depending on whether he or she sees the projections on the left as the duck's beak or the rabbit's ears. (With a little effort, you can reverse your perception of it.) Kuhn described a scientific revolution as a "paradigm shift," analogous to switching from seeing the image as a duck to seeing it as a rabbit.

FIGURE 1: DUCK/RABBIT ILLUSION



People have always wondered about law's consequences. Americans ask, "If we increase the sanction for speed limit violations, will fewer cars speed down the interstate?" Ancient Romans must have asked, "If we increase the sanction, will fewer chariots speed down the Via del Corso?" In law, most of the answers come from intuition: "If I were a speeder, would a higher sanction deter me?" In the twentieth century,

1. *See* THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS (3d ed. 1996).

legal scholars began to supplement intuition with social science. Statistics tested hypotheses, but the hypotheses were seldom derived explicitly from a deductive body of scientific theory—until the injection of economics into legal scholarship.

Beginning with studies in regulated industries, antitrust, and taxation in the 1950s, scholars deduced hypotheses about law from microeconomic theory and tested them statistically. Scholarship gradually revealed a fundamental isomorphism between demand in economics and deterrence in law. The proposition that the demand curve slopes down is grandly called the "First Law of Demand." Economics has a precise mathematical theory to explain why the demand curve slopes down. This theory also identifies the situational factors affecting the degree of the slope (the "elasticity of demand").[2] Furthermore, economics has a sophisticated statistical branch (econometrics) for estimating demand elasticities. The economic proposition that the demand curve slopes down corresponds to the legal proposition that sanctions deter, which is humbly called the "deterrence hypothesis."[3] By connecting demand and deterrence, economists could adapt the superior models and statistics in economics to factual questions about deterrence that interested lawyers. Thus, science began to replace intuition in predicting the effects of laws.

In Mechelen, Belgium, an ancient clock tower's three faces enabled merchants to know the time at home and also in two neighboring towns (each town had its own time). Centuries of technical progress shrunk the wheels inside Europe's clock towers until they could fit inside a wristwatch. No amount of technical progress among clockmakers, however, would have discovered how to keep time by vibrating a quartz crystal. That technology had to come from outside the clock-making tradition. Similarly, no refinement of intuitive and humanistic reasoning by legal scholars could have produced the economic analysis of law. The economic apparatus for making and testing hypotheses had to come into law from outside its traditions. Specifically, the reinterpretation of deterrence as demand had to come from economics. This was an abrupt jump, a revolution in thought, a paradigm shift, a reversal from duck to rabbit, a new research agenda with new tools.

Most U.S. law professors, including many critics of L&E, admit that law and economics is an intellectual revolution in law. Has an intellectual revolution ever occurred inside L&E? One candidate is the introduction of game theory, which made behavioral predictions fully strategic. While this change is large, I do not think that it is large enough to count as a revolution.

2. The elasticity is the downward slope expressed as a percentage and multiplied by -1. *See* N. GREGORY MANKIW, PRINCIPLES OF MICROECONOMICS 90–97 (5th ed. 2008).

3. *See generally* David A. Anderson, *Deterrence Hypothesis and Picking Pockets at the Pickpocket's Hanging*, 4 AM. L. & ECON. REV. 295 (2002) (defining deterrence theory in the context of harsher penalties and concluding that majority of criminals do not perceive the risk of apprehension or punishment before committing a crime).

Another candidate is evolutionary economics, which seeks to explain ("endogenize") preferences. Economists persistently take preferences as given. A satisfactory explanation of preferences would count as a scientific revolution in economics. While evolutionary theory is useful, it leaves so much unexplained about preferences that the influence of evolutionary theory on L&E remains modest, too modest to count as a scientific revolution.

I have some hope that law and growth economics—a subject of my current research—might someday provoke a paradigm shift, but so far its influence is far less than the preceding candidates that I already rejected.

The most promising candidate for a scientific revolution inside L&E is law and behavioral economics. Behavioral economics replaces the economic assumption of heroic rationality with the more modest assumption of diminished rationality. This change modifies many predictions. Testing them often requires experimental methods. Just as L&E came from outside the legal tradition, so the theories and methods of behavioral economics came from outside economics, specifically from cognitive psychology. While I think that law and behavioral economics comes closest to a paradigm shift inside L&E, my view is that it still falls short. Instead of a revolution, I would describe law and behavioral economics as a successful insurrection that ended by granting the insurgents a prominent seat in the government.

Instead of defending this view about law and behavioral economics, however, I must return to this Article's main subject—ELS. Since the demand curve slopes down, pure theory in L&E often gives the sign of a behavioral response to the law. The desirability or undesirability of most laws and policies, however, depend on the magnitude of the behavioral response, not just the sign. Estimating elasticities is necessary to the progress of legal science and policy making, like sequencing genes is necessary to biology. Over the years, the time and effort required to do empirical research diminished sharply through the development of statistical packages for personal computers, the collection of new data sets, and the diffusion of improved econometric methods. The quantity and quality of ELS scholarship improved quickly.[4] Everyone in L&E recognized the need for more empirical research decades before the ELS movement,[5] and almost everyone rejoiced when ELS arrived.

Earlier I described normal science as deducing hypotheses from current theory and testing them empirically. ELS accumulates evidence about hypotheses, thus gradually improving the science of law. As ELS

4. For evidence and reflections on the success of ELS, see Theodore Eisenberg, *The Origins, Nature, and Promise of Empirical Legal Studies and a Response to Concerns*, 2011 U. ILL. L. REV. 1713; and Michael Heise, *An Empirical Analysis of Empirical Legal Scholarship Production, 1990–2009*, 2011 U. ILL. L. REV. 1739.

5. When Tom Ulen and I wrote the first edition of our textbook, we regarded the paucity of empirical studies in the field as a gaping hole in our book. *See* ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS (1st ed. 1988).

proceeded, there was no abrupt jump in theory, no revolution in thought, no paradigm shift, no reversal from duck to rabbit. The emergence of ELS changed L&E, but ELS is not a candidate for a Kuhnian scientific revolution. Like Kuhn's account of normal science, empirical research improves social science by small increments, not large jumps. Normal science swims in the stream like a fish, whereas revolutionary science jumps through the trees like a lemur.

Instead of a paradigm shift, ELS matured the L&E revolution into a normal science. The character of social science dictates that empirical research, including ELS, is a fish, not a lemur. Some scientific propositions are universals similar to "all swans are white." The accumulation of confirming observations increases our confidence that a universal proposition is true. A single counterexample, however, can refute a universal proposition, like discovering a black swan in Australia.[6] Instead of a single counterexample, Kuhn thought that anomalies (false predictions) accumulate and weigh against a theory, until a scientific revolution shifts the paradigm. Whether or not Kuhn was right, we can be sure that a single observation never refutes a proposition in social science. In economics and other social sciences, predictions concern probabilities, not universals. Econometric tests of hypotheses require numerous observations to achieve statistical significance, and even then doubt persists. To achieve confidence in a statistical generalization, economists need independent researchers using different data and methods to confirm the same results. Statistical evidence necessarily changes statistical generalization slowly by accretion.

III. CONSEQUENCES FOR LEGAL SCHOLARSHIP

The maturation of L&E into normal science has sociological consequences for legal scholarship. L&E has always been an elite activity, like playing polo. Proceeding down the ranking of law schools, L&E scholarship diminishes, like ownership of polo ponies diminishes going down the income scale. This decline is apparent even within the top twenty-five law schools, as indicated in Figures 2 and 3. (The rankings on the horizontal axis are from *U.S. News and World Reports*, the vertical axis is data taken from the annual survey by the American Association of Law Schools, and the line sloping down is a simple (ordinary least squares) regression.) In the United States, more than two hundred law schools maintain research libraries, but in the vast majority of them no faculty member specializes in L&E research.

6. Karl Popper made much of the asymmetry between confirmation and disproof in his philosophy of science. *See* KARL POPPER, THE LOGIC OF SCIENTIFIC DISCOVERY 28–30 (Verlag von Julius Springer trans., 7th ed. 2002).

FIGURE 2: NUMBER OF LAW PROFESSORS WITH ADVANCED DEGREES IN ECONOMICS AND TOP TWENTY-FIVE LAW SCHOOLS

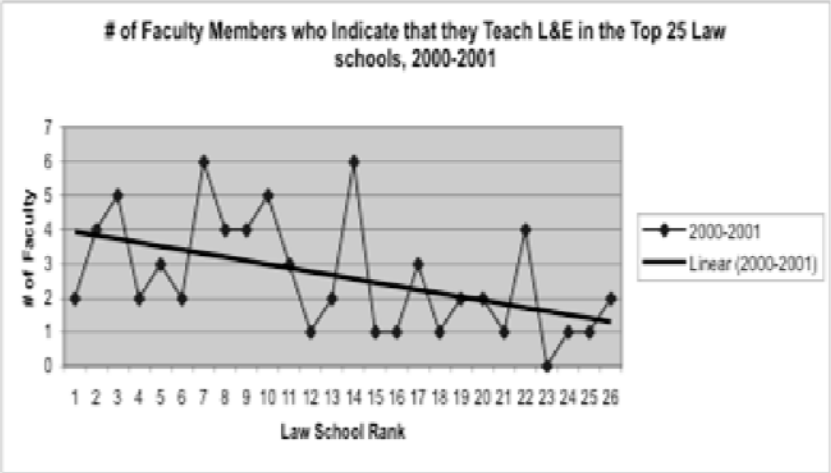
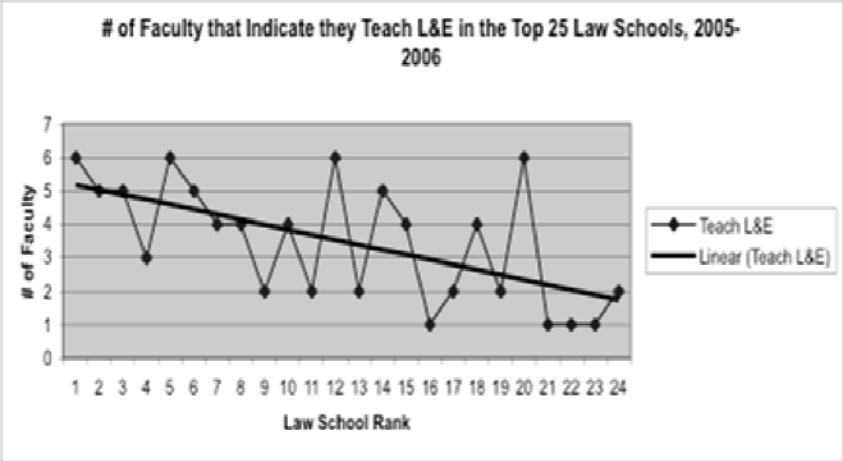


FIGURE 3: PROFESSORS TEACHING LAW AND ECONOMICS AND LAW SCHOOL'S RANKING



L&E has many polo players and few teamsters, but empirical legal studies may change this fact. Normal science generally provides algorithms that many people can use to advance science. A good education, scientific instruments, effort, and time suffice to sequence genes. Brilliance is unnecessary. The same is true of estimating elasticities. With

improved data, statistical techniques, and computer programs, faculty in lower-ranked law schools can do valuable studies in ELS that test hypotheses in L&E. Faculty in nonelite law schools can advance their academic careers by making significant empirical discoveries. Also, the analysis of specialized databases is increasingly relevant to the practice of law. Faculty members with specialized empirical knowledge have more opportunities to sell their expertise to courts and policy makers. The most important sociological effect of ELS might turn out to be the diffusion of L&E into nonelite law schools.

IV. CAUSES VERSUS CONTENTS

The bar exam imposes a limit on how far L&E can spread. The lower-ranked law schools mostly teach for the bar exam. Unless training in ELS and L&E help students in lower-ranked law schools to pass the bar exam, few of them will want to study the science of law and few faculty will be hired to teach it.

Jody Kraus and I have distinguished two enterprises in legal scholarship.[7] The first is the "content enterprise," which asks questions such as:

- What does the law require of officials and citizens?
- What are the legal duties, powers, and rights of officials and citizens?
- What is the correct interpretation of statutes, regulations, and court decisions?
- What is the law in a given jurisdiction?

For example, the content enterprise tries to distinguish between accidents subject to the rule of strict liability and accidents subject to the rule of negligence. These questions are the central concerns of legal education.

The second is the "cause enterprise," which asks questions such as:

- What are the effects of a given law?
- Who benefits from a law and who is harmed by it?
- How does a law affect economic efficiency?
- How does a law change the distribution of income?
- What causes some jurisdictions to adopt a particular law instead of an alternative adopted in other jurisdictions?

These questions are central concerns of law and social science, including L&E and ELS.

7. Robert Cooter & Jody S. Kraus, *The Measure of Law and Economics* (Aug. 2010) (unpublished manuscript) (on file with author).

Many law professors describe themselves as teaching legal rules and reasoning to students. The lower-ranked law schools especially teach legal rules. In lower-ranked law schools, preparing for the bar remains all-absorbing. By learning legal rules, students can pass the bar exam and practice law, even though their understanding of law's effects is intuitive and not scientific. This fact limits the extent to which the cause enterprise can penetrate the lower-ranked law schools. In contrast, higher-ranked law schools especially teach legal reasoning. Arguing a case before an appeals court increasingly involves using social science to predict the causes and effects of alternative interpretations of the law. Thus legal reasoning increasingly encompasses the cause enterprise.

A science of law would move towards the center of nonelite teaching and practice if understanding of law's effects became necessary to passing the bar exam and practicing law. Legal content would have to depend on legal effects for significant bodies of law. To illustrate, some L&E scholars assert that the common law evolves towards efficiency. They claim (or used to claim) that strict liability tends to become the rule in tort law when it provides more efficient incentives than a negligence rule, and negligence tends to become the rule when it provides more efficient incentives than a strict liability rule.[8] According to this argument, accident law's emerging content depends on the effects of alternative tort liability rules. If this argument were correct, then the content enterprise in tort law would presuppose the cause enterprise.

Few people still proclaim that tort law evolves towards efficiency. Perhaps a similar claim about contract law is more convincing.[9] Or perhaps similar claims can be made about other bodies of law, such as constitutional law. (I have just published two coauthored papers arguing that the consequences of alternative constitutional interpretations determine which one is correct.[10])

8. This was perhaps the most famous and controversial claim first to emerge from Richard Posner. RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 178–82 (7th ed. 2010).

9. *See* Jody S. Kraus, *The Correspondence of Contract and Promise*, 109 COLUM. L. REV. 1603 (2009). For the best account of why the common law might require interpretation favoring economic efficiency, see Jody S. Kraus, *Transparency and Determinacy in Common Law Adjudication: A Philosophical Defense of Explanatory Economic Analysis*, 93 VA. L. REV. 287 (2007).

10. *See* Robert D. Cooter & Michael D. Gilbert, *A Theory of Direct Democracy and the Single Subject Rule*, 110 COLUM. L. REV. 687 (2010); Robert D. Cooter & Neil S. Siegel, *Collective Action Federalism: A General Theory of Article I, Section 8*, 63 STAN. L. REV. 115 (2010).

V. CONCLUSION

A popular bumper sticker reads, "Are we having fun yet?" Many law and social science scholars wonder, "Are we a science yet?" Because of ELS, the answer is "yes" for L&E. The maturation of L&E into normal science is intoxicating. However, the peripheral influence of L&E on law's content is sobering. To make ELS and L&E central to law's content, scholars must show that correct legal reasoning often requires scientific prediction of law's effects. If judges become convinced that law's content depends on its effects, then understanding legal science will become necessary to pass the bar exam.[11] The correct interpretation of law has always depended significantly on its consequences. People make laws for their own benefit, so the benefits of alternative interpretations of a law help to determine which interpretation is correct. The next task of ELS is to make the correct interpretation of law depend significantly on its *scientific* consequences, not merely on its *intuitive* consequences.

11. Jody S. Kraus and I believe that the case for the efficiency of the common law was never made correctly, and we hope to correct this in future research.