

# Legal Theory Lessons from the Financial Crisis

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## INTRODUCTION

What lessons should we draw from the financial crisis? Many scholars have addressed this question in narrow terms, focusing on specific reforms to the financial system.<sup>1</sup> The literature has remained remarkably quiet on the broader question of what lessons the crisis teaches about the theory of law and economics. This Article addresses this question in the realm of laws regulating complex systems. This realm includes, at a minimum, the fields of financial regulation, environmental law, intellectual property, and antitrust law. These areas (and many others) involve substantial problems of discontinuities, surprise, nonlinearities, and complexity, which create huge challenges for cost-benefit analysis (CBA) based on statistical probability functions. Furthermore, in these dynamic areas, the most important problems often stem from the least predictable phenomena, at least quantitatively.

This Article argues that for these sorts of dynamic problems the current theory of law and economics has proven inadequate. That theory treats law as if it were a mere transaction, much like the purchase of a good. Accordingly, it emphasizes attainment of

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1. See, e.g., Lynne L. Dallas, *Short-Termism, the Financial Crisis and Corporate Governance*, 37 J. CORP. L. 265, 274–78 (2012) (proposing numerous financial reforms to address the short term orientation that the financial crisis revealed); Jeffrey N. Gordon & Christopher Muller, *Confronting Financial Crisis: Dodd-Frank's Dangers and the Case for a Systemic Emergency Insurance Fund*, 28 YALE J. ON REG. 151 (2011) (discussing the 2007–08 financial crisis and proposing the creation of a Systemic Emergency Insurance Fund); Kathryn Judge, *Fragmentation Nodes: A Study in Financial Innovation, Complexity, and Systemic Risk*, 64 STAN. L. REV. 657, 662 (2012) (recommending reforms to reduce finance's complexity).

equilibrium between costs and benefits, captured by the microeconomic concept of allocative efficiency.<sup>2</sup> This Article argues that at least for these dynamic systems, this ideal proves both unattainable and not terribly important.

It rests these conclusions primarily on two grounds. First, in a dynamic system with significant discontinuities and true uncertainties, complexity defeats optimality as a goal for legal decisions because optimality becomes impossible to calculate and relatively unimportant.<sup>3</sup> Furthermore, the financial crisis teaches us that the CBA substitutes neoclassical law and economics employs to cope with intractable problems of complexity and uncertainty—assumptions of rationality and perfect information—work very badly as guides to major policy decisions.

The second ground for doubting allocative efficiency's utility as a guide to law in this context is more institutional in nature. Law is not a transaction. Law by its nature provides a framework that influences, but usually does not control, resource allocation. Accordingly, most law is neither efficient nor inefficient. It simply provides the framework under which market actors seek to achieve efficient outcomes. Hence, it is often not possible to determine whether a law is efficient. Because law provides a framework, it should be thought of as more closely analogous to macroeconomic policy (which likewise influences but does not control resource allocation) than to the transactions that microeconomics typically focuses on.

These insights have profound implications for legal theory. They mean that law and economics' problems run deeper than the debate about whether to use neoclassical assumptions or assumptions from behavioral and institutional economics to "predict" which legal rules will prove efficient. Instead, these two problems—the dynamic nature of many regulated systems and the institutional place of law—undermine the use of efficient transactions as a legal model at least in the many areas of law that regulate complex irregular phenomena.

One can imagine a unifying role for legal theory combining law and economics to address complex systems that avoids these problems, but this new role would substantially change law and economics' focus, goals, and methods to make it more macroeconomic and less transaction-oriented, at least when it addresses the law of complex systems. Policymakers and scholars should focus on the shape of change over time, treating legal reform as an effort to countervail negative long-term trends, adopt a goal of avoiding systemic risks while keeping open a robust set of economic opportunities, and employ economic dynamic analysis, a method for bringing institutional economic insights to bear on legal problems. To be sure, no theory of law and economics captures all important legal goals. But, I argue that this approach, which I call an economic dynamic approach, does a much better job of focusing on important problems and addressing complex dynamic systems than the microeconomic approach to law and economics.

Although legal scholars have said little about the financial crisis' implications for legal theory, economists such as Paul Krugman and Joseph Stiglitz saw the financial crisis as a major challenge to the neoclassical microeconomic model, which underlies Chicago

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2. See RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 8–9 (7th ed. 2007) (discussing the concept of a competitive equilibrium as the goal of a set of transactions).

3. See generally Alex Rosenberg & Tyler Curtin, *What is Economics Good For?*, N.Y. TIMES (Aug. 24, 2013), [http://opinionator.blogs.nytimes.com/2013/08/24/what-is-economics-good-for/?\\_php=true&\\_type=blogs&\\_r=0](http://opinionator.blogs.nytimes.com/2013/08/24/what-is-economics-good-for/?_php=true&_type=blogs&_r=0) (pointing out that economics does not have a track record of successful prediction).

School law and economics.<sup>4</sup> Although obviously concerned about government economic policy, these Nobel Prize winning economists did not address what changes this challenge to the neoclassical model might portend for legal theory. Their work, however, strongly suggests a macro, rather than micro, economic focus, an emphasis quite congruent with the approach I advocate here.<sup>5</sup>

Richard Posner, who has addressed the crisis' implications for legal theory, acknowledges the central role of macroeconomics in thinking about responses to the economic crisis, but does not treat macroeconomics as useful for the theory of law and economics more generally.<sup>6</sup> He goes on to highlight the need for law and economics to address uncertainty, not just in the sense of risk (cases of known probabilities), but also in cases of true Knightian uncertainty (where probabilities are unknown).<sup>7</sup> And his writing acknowledges that this need to address uncertainty reaches beyond the domain of financial regulation.<sup>8</sup> Yet, his writing on the financial crisis sees uncertainty as a technical problem in understanding "efficient responses" to the business cycle, thus keeping the focus on the microeconomic goal of efficiency and preserving neoclassical assumptions about human behavior.<sup>9</sup> This Article argues that Posner's acknowledgment that uncertainty defeats CBA leads to the conclusion that allocative efficiency does not work as a central goal for regulation of complex dynamic systems.

This Article's first part provides relevant background by discussing traditional law and economics and how neoclassical law and economics contributed to the financial crisis. The second part explains why the complex nature of many systems that law must regulate makes efforts to achieve efficient outcomes futile and relatively unimportant. The third part focuses upon the institutional role of law, showing that law usually provides a long-term framework that typically influences, but does not control, resource allocation, thereby undermining the transaction-focused microeconomic theory of law. The fourth part argues for the economic dynamic approach that I briefly summarized above.

Because I have written a book on economic dynamics, this fourth part offers only a brief sketch of that alternative.<sup>10</sup> Furthermore, the validity of the lessons I draw from the financial crisis about the triviality and uselessness of an "optimality" goal for law addressing complex systems does not depend on the full acceptance of the economic dynamic alternative I sketch out in the fourth part.

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4. See Paul Krugman, *How Did Economists Get it So Wrong?*, N.Y. TIMES MAGAZINE (Sept. 2, 2009), <http://www.nytimes.com/2009/09/06/magazine/06Economic-t.html?pagewanted=all> (blaming "neoclassical purists" for economists' "blindness to the very possibility of catastrophic failures in a market economy"); JOSEPH E. STIGLITZ, *FREEFALL: AMERICA, FREE MARKETS, AND THE SINKING OF THE WORLD ECONOMY* xi–xvii (2010) (blaming the crisis in part on "free market fundamentalism" supported by flawed economic theories).

5. See PAUL KRUGMAN, *THE RETURN OF DEPRESSION ECONOMICS AND THE CRISIS OF 2008* 189–90 (2009) (arguing for regulation of essential financial institutions to avoid excessive risks that could produce a macroeconomic crisis); STIGLITZ, *supra* note 4, at xiii–xvii (describing the task ahead as avoiding a new crisis and drawing on experience in macroeconomic policy).

6. See Richard A. Posner, *On the Receipt of the Ronald H. Coase Medal: Uncertainty, the Economic Crisis, and the Future of Law and Economics*, 12 AM. L. & ECON. REV. 265, 268 (2010) (suggesting the need for macroeconomics to inform financial reform).

7. See *id.* at 272–74 (distinguishing risk from uncertainty with examples).

8. See RICHARD A. POSNER, *CATASTROPHE: RISK AND RESPONSE* 149–50, 171 (2004) (discussing terrorist attacks and catastrophic climate disruption as examples of phenomena characterized by Knightian uncertainty, not probabilistic risk).

9. See Posner, *supra* note 6, at 274 (discussing "efficient responses" to the business cycle).

10. DAVID M. DRIESEN, *THE ECONOMIC DYNAMICS OF LAW* (2012).

## I. TRADITIONAL LAW AND ECONOMICS AND THE FINANCIAL CRISIS

This part begins by discussing the basics of neoclassical law and economics and how its assumptions tend to support deregulation. It then shows that these ideas helped support the deregulation that set the stage for the financial crisis. It closes with a discussion of Richard Posner's defense of the neoclassical model in the aftermath of the crisis.

## A. Law and Microeconomics

When scholars write about law and economics they mean law and microeconomics.<sup>11</sup> Law and economics neglects the entire field of macroeconomics.<sup>12</sup> Microeconomics addresses the behavior of particular market actors or of discrete groups of market actors.<sup>13</sup> By contrast, macroeconomics concerns itself with the economy as a whole, including such key concerns as economic growth, depressions, and job creation.<sup>14</sup> The individual transaction serves as the archetypical unit of analysis in microeconomics.<sup>15</sup> The microeconomic model tends to focus on achievement of equilibrium, rather than the questions of growth and decline at the heart of macroeconomics.<sup>16</sup>

Law and economics' creators established allocative efficiency as legal analysis' principal goal.<sup>17</sup> This idea flows from the transactional model that underlies microeconomics.<sup>18</sup> Use of the allocative efficiency concept to guide law implies that we should test legal reform's efficiency by asking whether a proposed reform generates benefits commensurate with its cost. An efficiency goal therefore leads to invocation of CBA as a methodology for evaluating the desirability of legal changes.

In some fields, such as government regulation protecting the environment, health, or safety, CBA has played a major role in evaluating legal decisions. Since Ronald Reagan's presidency, a series of executive orders have called for application of CBA to significant proposed regulations.<sup>19</sup> The prestige that CBA has gained through the elevation of the efficiency concept as a guide to legal decision-making has empowered a part of the White

11. See Mark Kelman, *Could Lawyers Stop Recessions? Speculations on Law and Economics*, 45 STAN. L. REV. 1215, 1216 (1993) (stating that legal scholars "invariably" think about microeconomics when they discuss economics' impact on law).

12. See Douglas A. Kysar, *Sustainability, Distribution, and the Macroeconomic Analysis of Law*, 43 B.C. L. REV. 1, 64 (2001) (noting that the study of law and economics traditionally excludes macroeconomics).

13. See Michael J. Zimmer, *Inequality, Individualized Risk, and Insecurity*, 2013 WIS. L. REV. 1, 40 (2013) (stating that microeconomics looks at the economy from the viewpoint of the individual "rational actor").

14. See Kelman, *supra* note 11, at 1223 (noting that issues of aggregate growth and periodic underemployment of labor and capital "dwarf" issues of "static allocative efficiency").

15. See RICHARD POSNER, *THE ECONOMIC ANALYSIS OF LAW* 3-11 (2nd ed. 1977) (making a voluntary transaction the efficiency model and examining various voluntary and involuntary transactions).

16. See Kysar, *supra* note 12, at 64 (distinguishing microeconomics' concern for optimality from macroeconomics' concern with the economy's scale).

17. C. Edwin Baker, *The Ideology of the Economic Analysis of Law*, 5 PHIL. & PUB. AFF. 3, 5-6 (1975) (showing that even in Posner's early work, law and economics treated efficiency as its goal); John F. Berry, *The Economics of Outside Information and Rule 10B-5*, 129 U. PA. L. REV. 1307, 1316 n.45 (1983) (identifying Pareto optimality as economic analysis and policy's "ultimate goal").

18. POSNER, *supra* note 15, at 11 (stating that a voluntary transaction occurs when both parties expect it to make them better off).

19. See, e.g., Exec. Order No. 12,291, 3 C.F.R. 127, 128 (1980-82), *reprinted in* 5 U.S.C. § 601 (1988) (providing that an agency shall consider a regulatory impact analysis, including a description of a rule's costs and benefits, when proposing a rule).

House, the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget, to review regulations, ostensibly to help ensure that a regulation's costs do not exceed its benefits.<sup>20</sup> OIRA, however, does not limit itself to application of an efficiency test, but instead engages in a rather free-ranging attempt to weaken regulation, even in cases where no CBA exists.<sup>21</sup> So, even in this field, where an executive order commands CBA, it often serves as a justificatory metaphor for actions taken on other deregulatory grounds.

In many fields, however, CBA works only as a justificatory metaphor without any actual CBA, in the sense of an analysis that quantifies costs and benefits in dollar terms. Instead, law and economics scholars often use neoclassical economic assumptions as a proxy for CBA, because they recognize that reasonably reliable CBA of many legal decisions addressing complex dynamic problems proves impossible.

A prototypical example of this use of neoclassical assumptions as a CBA substitute comes from Richard Posner and Robert Bork's pioneering work on antitrust. They argue for making efficiency antitrust law's primary goal.<sup>22</sup> But they also appreciate that mergers create uncertainty and work unpredictably, so they do not recommend CBA to evaluate a proposed merger's efficiency.<sup>23</sup> Instead, they assume that market actors contemplating mergers are rational and possess perfect information (or at least very good information).<sup>24</sup> Because of these assumptions, they find it likely that mergers will generate benefits exceeding their costs much more often than not because the firms proposing them would only do so if the proposed mergers were efficient.<sup>25</sup> In other words, neoclassical assumptions become a functional substitute for carrying out actual CBA.

In general, if one assumes that market actors are rational and possess perfect information, it would follow that they act efficiently very often. These assumptions suggest

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20. See Sandra Zellmer, *Treading Water While Congress Ignores the Nation's Environment*, 88 NOTRE DAME L. REV. 2323, 2392 (2013) (noting that OIRA's economic efficiency test has frequently been a "choke point" for proposed regulations).

21. See CASS R. SUNSTEIN, SIMPLER: THE FUTURE OF GOVERNMENT 7 (2013) (stating that OIRA frequently rejected rules in order to "reduce cumulative burdens" and to reduce complexity); David M. Driesen, *Is Cost-Benefit Analysis Neutral?*, 77 U. COLO. L. REV. 335, 370-76 (2006) (discussing OIRA's support for significant changes having nothing to do with CBA with some examples); Cass R. Sunstein, *The Office of Information and Regulatory Affairs: Myths and Realities*, 126 HARV. L. REV. 1838, 1869-71 (2013) (stating that costs and benefits "are not the key issue" in the OIRA process but mentioning staff recommendations to reduce paperwork and other burdens); see, e.g., Claudia O'Brien, *White House Review of Regulations Under the Clean Air Act Amendments of 1990*, 8 J. ENVTL. L. & LITIG. 51, 60 (1993) (claiming that OIRA review during the first Bush administration "focused primarily on political and policy issues" and CBA was "rarely mentioned").

22. ROBERT H. BORK, THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF 90-91 (1978) (stating "the whole task of antitrust" revolves around "improv[ing] allocative efficiency without" disproportionately "impairing productive efficiency"); RICHARD A. POSNER, ANTITRUST LAW: AN ECONOMIC PERSPECTIVE 4 (1976) (arguing efficiency should be antitrust law's sole goal).

23. See BORK, *supra* note 22, at 124, 219 (stating that the trade-off between output restriction and enhanced efficiency cannot be measured); POSNER, *supra* note 22, at 112 (characterizing efficiency measurement as an "intractable subject for litigation").

24. See, e.g., BORK, *supra* note 22, at 120 (relying on the assumption that firms behave as if rationally maximizing profits with perfect information).

25. See *id.* at 206-07 (suggesting a firm that chooses a merger over internal growth must be acting efficiently).

very little need for government regulation.<sup>26</sup> Accordingly, Bork and Posner favor much less stringent antitrust enforcement than prevailed at the time they began writing about these issues.<sup>27</sup> More generally, practitioners of neoclassical law and economics have been at the forefront of advocating deregulation in a host of fields, including, as we shall see, the area of financial regulation.<sup>28</sup>

The perfect information assumption has led to refinements in financial economics furthering neoclassical law and economics' tendency to support deregulation.<sup>29</sup> In particular, the efficient market hypothesis teaches us, in its most commonly used form, that after a short while financial assets reflect all publicly available information.<sup>30</sup> Belief in the efficient market hypothesis has led Chicago School law and economics scholars, especially those studying financial markets, to conclude that markets are self-correcting and therefore in little need of regulation.<sup>31</sup>

This does not mean that economic theory always supports deregulation. On the contrary, economic theory recognizes that markets often fail to incorporate all relevant costs.<sup>32</sup> For example, factory owners do not typically consider the harms pollution causes residents of surrounding communities. Economic theory recognizes that at least in some circumstances, such "external" (to the market) costs justify government regulation.<sup>33</sup> But neoclassical law and economics scholars regularly argue for no regulation or less regulation and the assumptions they use tend to lead to deregulatory outcomes.<sup>34</sup>

Even before the financial crisis, the project of basing law and economics on neoclassical assumptions generated controversy among law and economics scholars. From the beginning of modern law and economics the New Haven school, led by Guido Calabresi, assumed, in keeping with the teachings of new institutional economics, that

26. See, e.g., John B. McArthur, *Anti-trust in the New [De]Regulated Natural Gas Industry*, 18 ENERGY L.J. 1, 49–51 (1997) (pointing out the Chicago School's assumptions of "perfect information" and "other approximations to perfect competition" lead to the conclusion that "no regulation is the best regulation" in the area of anti-trust).

27. See Richard A. Posner, *The Chicago School of Antitrust Analysis*, 127 U. PA. L. REV. 925, 925 (1979) (summarizing some of the Chicago School's chief results).

28. See, e.g., Linda N. Edwards & Franklin R. Edwards, *A Legal and Economic Analysis of Manipulation in Futures Markets*, 4 J. FUTURES MARKETS 333, 351–58 (1984) (finding legal rules to prohibit manipulation in futures markets "unnecessary"); David R. Fischel & David J. Ross, *Should the Law Prohibit "Manipulation" in Markets*, 105 HARV. L. REV. 503, 547–50 (1991).

29. See Donald C. Langevoort, *Forward: Revisiting Gilson and Kraakman's Efficiency Story*, 28 J. CORP. L. 499, 501 (2003) (stating that the SEC highlighted the efficient market hypothesis as a justification for deregulation in a "handful" of rule adoptions).

30. See Eugene F. Fama, *Efficient Capital Markets: II*, 46 J. FIN. 1575, 1575 (1991) (defining the efficient market hypothesis as "security prices fully reflect[ing] all available information").

31. See generally Lynn A. Stout, *Are Securities Markets Costly Casinos?: Disagreement, Market Failure, and Securities Regulation*, 81 VA. L. REV. 611, 648–50 (1995) (describing the efficient market hypothesis as an article of faith in legal circles of the 1970s and 1980s).

32. See James E. Krier, *Risk and the Legal System*, 545 ANNALS AM. ACAD. POL. & SOC. SCI. 176, 179 (1996) (stating that economists often discuss externalities or "costs and benefits of activities that . . . a relevant actor fails to take into account").

33. See CLIVE L. SPASH, GREENHOUSE ECONOMICS: VALUE AND ETHICS 5 (2002) (explaining that economics views pollution as an externality that the market should be made to internalize).

34. See David Campbell, *The End of Posnerian Law and Economics*, 73 MOD. L. REV. 305, 305 (2010) (reviewing RICHARD A. POSNER, A FAILURE OF CAPITALISM: THE CRISIS OF '08 AND THE DESCENT INTO DEPRESSION (2009) (showing that Richard Posner's work almost always points toward regulating less rather than more)).

individuals and institutions manifest “bounded rationality,” meaning that they do not have perfect information and process information through a lens created by their habits, routines, and identity.<sup>35</sup> As law and economics increased its influence many legal scholars found that perfect information and rationality assumptions “assumed away” the most interesting problems in the fields they were studying.<sup>36</sup> The simplistic assumptions of neoclassical economics, however useful in constructing a theory of markets, seemed useless or even misleading in addressing many legal problems.<sup>37</sup> For example, Guido Calabresi’s pioneering work recognizes that people may engage in risky behavior because they lack perfect information about the risk involved.<sup>38</sup> Hence, a lot of law and economics began to adopt, often without explicitly mentioning institutional economics, assumptions congruent with that school of thought.

Cass Sunstein has championed behavioral economics as a guide to legal policy.<sup>39</sup> Behavioral economics replaces the rational actor model with more accurate models of human behavior based on empirical observation.<sup>40</sup> Behavioral economics has given rise to schools of behavioral finance and antitrust law, which focus on financial actors’ behavior.<sup>41</sup> Behavioral antitrust scholars sometimes explain empirical findings that mergers often destroy shareholder value by suggesting that mergers may often reflect the egos of empire building executives and therefore not prove efficient.<sup>42</sup>

Neoclassical, neoinstitutional, and behavioral economics, however, remain united (to a degree) in making efficiency legal theory’s primary goal. They might vary in their

35. See Herbert A. Simon, *Rational Choice and the Structure of the Environment*, in *MODELS OF MAN: SOCIAL AND RATIONAL* 261, 270–71 (1957); see, e.g., GUIDO CALABRESI, *THE COST OF ACCIDENTS* 148–49 (1970) (explaining that “the cheapest cost avoider” might have insufficient information about the risk of accidents).

36. See Eric Posner, *Economic Analysis of Contract Law After Three Decades, Success or Failure?*, 112 *YALE L.J.* 829, 865 (2002) (stating that if parties could foresee the future and contract accordingly “contract law would be simple and uninteresting”).

37. See Geoffrey Hodgson, *Reforming Economics After the Financial Crisis*, 2 *GLOBAL POL’Y* 190, 190, 194 (2011) (urging economists to replace “unrealistic assumptions” demonstrating markets are self-correcting with models “orient[ed] towards the real world they are trying to help explain”); Krugman, *supra* note 4, at 36–40 (linking neoclassical assumptions to an inability to see the possibility of financial meltdown); Susanna Kim Ripken, *The Dangers and Drawbacks of the Disclosure Antidote: Towards A More Substantive Approach To Securities Regulation*, 58 *BAYLOR L. REV.* 139, 146–47 (2006) (stating that the rational actor assumption leads to policies favoring financial disclosure, despite evidence showing “too much disclosure” can impair investors’ decisions).

38. See, e.g., CALABRESI, *supra* note 35, at 148–49 (explaining that externalization could occur because the cheapest cost avoider might have insufficient information about the risk of accidents).

39. See RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 6–8 (2008) (linking the book’s treatment of nudges to the insight that human behavior has predictable biases and does not conform to the rational actor model in many significant cases).

40. See Amanda P. Reeves & Maurice E. Stucke, *Behavioral Antitrust*, 86 *IND. L.J.* 1527, 1532 (2011) (defining behavioral economics); see, e.g., Jack L. Knetsch & J. A. Sinden, *Willingness to Pay and Compensation Demanded: Experimental Evidence of an Unexpected Disparity in Measures of Value*, 99 *Q. J. OF ECON.* 507, 516, 518 (1984) (describing this study as adding to past studies showing a “wide disparity” between willingness to pay and willingness to accept and describing this disparity as a “behavior pattern[.]”).

41. See generally ANDREI SHLEIFER, *INEFFICIENT MARKETS: AN INTRODUCTION TO BEHAVIORAL FINANCE* (2000) (challenging the efficient market hypothesis); *ADVANCES IN BEHAVIORAL FINANCE* (Richard H. Thaler ed., 1993); Reeves & Stucke, *supra* note 40 (discussing how behavioral economics can inform antitrust law).

42. See Reeves & Stucke, *supra* note 40, at 1562–63 (discussing studies showing that executives frequently overestimate their capacity to manage a merger to produce efficient results).

assumptions and therefore in their conclusions about what choices are efficient, but efficiency remains the goal they devote most of their attention to. Even though law and economics scholars recognize that other goals matter and a few even suggest that justice matters more than efficiency, the constant focus on efficiency in law and economics scholarship skews the field toward that goal.<sup>43</sup> In other words, the evolution of law and economics did not fundamentally change its transaction-focused microeconomic orientation.

This efficiency focus remains predominant even though scholars have cast doubt on allocative efficiency's normative value. Richard Posner sought to justify efficiency as a major goal for legal systems by linking efficiency to "wealth maximization," which he defended as a valuable normative goal for law.<sup>44</sup> In the 1980s, Ronald Dworkin responded to Richard Posner's claim that a wealth maximization goal justifies economic efficiency by asking if wealth is a value.<sup>45</sup> Dworkin's suggestion that wealth maximization is not a normative value for law led even Posner to doubt his primary normative defense of efficiency as a major goal for legal systems.<sup>46</sup> More recently, scholars have cast doubt on the relationship between wealth maximization and well-being.<sup>47</sup> An extensive psychological literature claims that increased wealth, past a basic minimum level, does not increase people's happiness.<sup>48</sup> Hence, scholars have cast grave doubt on efficiency's normative value.

Efficiency seems to live on as a legal ideal because of its image as a neutral goal (which I have questioned elsewhere) and because legal scholars claim that economists can

43. See Richard A. Posner, *Cost-Benefit Analysis: Definition, Justification, and Comment on Conference Papers*, 29 J. LEGAL STUD. 1153, 1154 (2000) (suggesting that efficiency is a social value, but "not the only social value"); Guido Calabresi, *First Party, Third Party, and Products Liability Systems: Can Economics of Law Tell Us Anything About Them*, 69 IOWA L. REV. 833, 834 (1984) (claiming that economic efficiency is part of common notions of justice); Guido Calabresi, *About Law and Economics: A Letter to Ronald Dworkin*, 8 HOFSTRA L. REV. 553, 554 (1980) (articulating a subtle position tending to value efficiency, but making justice the ultimate test of law); cf. Ronald Dworkin, *Why Efficiency?: A Response to Calabresi and Posner*, 8 HOFSTRA L. REV. 563, 563–73 (1980) (challenging Calabresi's efforts to reconcile justice and efficiency).

44. See Richard A. Posner, *The Value of Wealth: A Comment on Dworkin and Kronman*, 9 J. LEGAL STUD. 243, 243–44 (1980) [hereinafter Posner, *The Value of Wealth*] (arguing that efficiency advances wealth maximization, and that efficiency therefore is an ethically attractive goal for law); Richard A. Posner, *The Ethical and Political Basis for the Efficiency Norm in Common Law Adjudication*, 8 HOFSTRA L. REV. 487 (1980) [hereinafter Posner, *Ethical and Political Basis*] (arguing that a wealth maximization goal is ethically attractive).

45. See Ronald M. Dworkin, *Is Wealth a Value?*, 9 J. LEGAL STUD. 191 (1980) (addressing this question); see also Jules L. Coleman, *Efficiency, Utility and Wealth Maximization*, 8 HOFSTRA L. REV. 509, 526–40 (1980) (challenging the ethical basis for wealth maximization as a paramount value of society).

46. See POSNER, *supra* note 2, at 11–15 (explaining why efficiency has "grave limitations" as an "ethical criterion for social decisionmaking"); cf. Richard A. Posner, *Wealth Maximization Revisited*, 2 NOTRE DAME J. L. ETHICS & PUB. POL'Y 85, 90 (1985) (characterizing wealth maximization as a "reasonable goal" for society); Louis Kaplow & Steven M. Shavell, *Fairness Versus Welfare*, 114 HARV. L. REV. 961, 966 (2001) (taking a much more militant position on efficiency's primacy in legal ethics).

47. See Ed Diener & Robert Biswas-Diener, *Will Money Increase Subjective Well-Being?: A Literature Review and Guide to Needed Research*, 57 SOC. INDICATORS RES. 119, 121 (2002) (reviewing studies that cast doubt on the idea that having more money makes people happier).

48. See ROBERT H. FRANK, *LUXURY FEVER: WHY MONEY FAILS TO SATISFY IN AN ERA OF SUCCESS* 6 (1999) (arguing that after a certain threshold is reached increases in material wealth do not increase well-being); Richard A. Easterlin, *Will Raising the Incomes of All Increase the Happiness of All?*, 119 J. ECON. BEHAV. & ORG. 35, 35 (1995) (stating that acquiring wealth past a basic level does not increase people's happiness); cf. Matthew Adler & Eric A. Posner, *Happiness Research and Cost-Benefit Analysis*, 37 J. LEGAL STUD. 253, 271–72 (2008) (pointing out that money can be spent on things having objective value).



tell us what measures are efficient, but that economists cannot do anything else.<sup>49</sup> This Article questions the claim that economists can tell us what legal measures are efficient in a significant class of cases, and the entire fields of macroeconomics and game theory show that economists do other things.<sup>50</sup> Although scholars have sharply questioned efficiency's normative value as an ideal for government, and economists have been known to do things other than predict efficient outcomes, law and microeconomics has influenced the law in a variety of fields.<sup>51</sup>

### B. Deregulation and the Financial Crisis

Leading economists such as Joseph Stiglitz blame neoclassical economics for the financial crisis.<sup>52</sup> They do so, in part, because neoclassical economics led to excessive confidence in financial institutions' ability to police themselves and therefore provided the "intellectual armor" justifying deregulation that set the stage for a disaster.<sup>53</sup> The activities creating the financial crisis became legal because of deregulation that began in the 1980s.<sup>54</sup> Indeed, nearly everything that financial firms did to create the financial crisis was illegal under the regulatory regime put in place in the wake of the Great Depression.<sup>55</sup>

This deregulation seemed sensible to policy-makers in both political parties in part because they tended to view markets as self-regulating, a view that appears to make sense if one sees market actors as rational actors possessed of perfect information and accepts the efficient market hypothesis.<sup>56</sup> In particular, the efficient market hypothesis cast doubt on the Keynesian view of markets as prone to wild vacillations from time to time and therefore on the need for structural regulation.<sup>57</sup> The translation of this hypothesis in the

49. See Driesen, *supra* note 21, at 390–92 (showing that an efficiency test is not neutral relative to other potential tests even in theory).

50. See Don Fullerton & Robert N. Stavins, *How Economists See the Environment*, in *ECONOMICS OF THE ENVIRONMENT* 1, 8 (Robert N. Stavins ed., 5th ed. 2005) (pointing out that "many economists" analyze distributional issues).

51. See, e.g., THOMAS PIKETTY, *CAPITAL IN THE TWENTY-FIRST CENTURY* (2014) (providing a book-length treatment of the economics of inequality).

52. See STIGLITZ, *supra* note 4, at xi (blaming the crash in part on the efficient market hypothesis).

53. *Id.* at xi, xvi–xvii (claiming that many economists provided the intellectual armor that the policymakers invoked in the movement toward deregulation after identifying the belief that markets are "efficient" and self-correcting as a core problem).

54. See DRIESEN, *supra* note 10, at 36–45 (listing the specific actions creating the financial crisis and the deregulatory decisions that made them legal).

55. See *id.*

56. See Brooksley Born, *Foreword: Deregulation: A Major Cause of the Financial Crisis*, 5 HARV. L. & POL'Y REV. 231, 232 (2013) (discussing the many actors who believed that markets self-regulate and how that belief supported deregulation); see, e.g., NATIONAL COMMISSION ON THE CAUSES OF THE FINANCIAL AND ECONOMIC CRISIS IN THE UNITED STATES, *THE FINANCIAL CRISIS INQUIRY REPORT* 170–74 (2011) [hereinafter NATIONAL COMMISSION] (attributing the failure of regulators to vigorously address insufficient capital and declines in mortgage underwriting standards in part to the belief that "markets will always self-correct"); GILLIAN TETT, *FOOL'S GOLD: HOW THE BOLD DREAM OF A SMALL TRIBE AT J.P. MORGAN WAS CORRUPTED BY WALL STREET GREED AND UNLEASHED A CATASTROPHE* 31–32 (2009) (explaining that the banking industry's leading lobbyist against derivatives regulation and other key people admired the creators of the efficient market hypothesis, and regarded it as showing the value of self-regulation).

57. James R. Hackney, Jr., *On Markets and Regulation: Posner's Conservative Pragmatist Evolution*, 3 L. & FIN. MARKETS REV. 539, 540 (2012) (book review); see, e.g., RICHARD A. POSNER, *THE CRISIS OF CAPITALIST DEMOCRACY* 29–30 (2010) (noting that Eugene Fama, a creator of the efficient markets hypothesis, does not believe that the increase in housing leading to the financial crisis constituted a bubble).

political sphere and to a large extent among academic lawyers steeped in microeconomics simply held that a transaction's existence usually proved its goodness.<sup>58</sup> The ideological climate that neoclassical law and economics helped create led to a dismantling of the regulatory regime put in place to prevent another Great Depression.

The Glass–Steagall Act of 1933, a major part of this regime, erected a wall between commercial and investment banking.<sup>59</sup> Thus, during a long period of post-World War II prosperity, no institution could both carry out commercial lending and underwrite securities.<sup>60</sup> This separation seems to have limited systemic risk by making it likely that a failure in one banking sector would not contaminate the entire economy.<sup>61</sup> Although some major financial institutions collapsed during this period, these collapses did not lead to a global catastrophe rivaling the Great Depression.<sup>62</sup>

The ideological climate of the 1980s led the government agencies implementing Glass–Steagall to erode this separation.<sup>63</sup> This erosion paved the way for expanding the securitization of loans that led to the financial crisis. Lehman Brothers, Bear Sterns, Merrill Lynch, Citibank, and Goldman Sachs—large financial institutions at the heart of the financial crisis—persuaded the Federal Reserve Board to allow bank holding companies to both originate and securitize mortgages.<sup>64</sup> The key regulatory decision expressed faith in free market actors' ability to self-police by rejecting arguments that securitization would create incentives for making unsound loans, which is precisely what happened during the financial crisis.<sup>65</sup>

Congress consummated the tearing down of the wall between commercial and investment banking by repealing key aspects of Glass–Steagall outright, thereby paving the way for a great expansion in the securitization of poor quality loans.<sup>66</sup> This repeal also allowed the growth of too-big-to-fail institutions—institutions so large that their demise would threaten the entire economy—which often combined both commercial and

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58. See, e.g., BORK, *supra* note 22, at 206–07 (suggesting a firm will only make efficient decisions).

59. See *Sec. Indus. Ass'n v. Bd. of Governors*, 468 U.S. 137, 147 (1984) (stating that Glass–Steagall sought to “separate as completely as possible commercial from investment banking”).

60. See *id.* at 148–49 (describing how the prohibitions in Sections 16 and 21 of Glass–Steagall effectively insulated commercial banks' activities from investment banks' activities).

61. See *id.* at 144–48 (stating that Glass–Steagall responded to the widespread perception that commercial banks' involvement in investment banking had caused much of the commercial banks' financial problems precipitating the Great Depression); cf. Peter J. Ferrara, *The Regulatory Separation of Banking from Securities and Commerce in the Modern Financial Marketplace*, 33 ARIZ. L. REV. 583, 586–88 (1991) (claiming that the creation of small banks, not the mingling of disparate activities, caused the Great Depression).

62. See KRUGMAN, *supra* note 5, at 157 (pointing out that Glass–Steagall “protected the economy from financial crises for almost seventy years”).

63. See Jonathan R. Macey, *The Business of Banking: Before and After Gramm-Leach-Bliley*, 25 J. CORP. L. 691, 691–92 (2000) (characterizing the separation as a “dead letter” because of regulatory evisceration by the time Congress formally repealed it).

64. See Roberta S. Karmel, *An Orderly Liquidation Authority Is Not the Solution to Too-Big-To-Fail*, 6 BROOK. J. CORP. FIN. & COM. L. 1, 7–8, 11 (2011) (explaining how banks' pressure on regulators ultimately led to Glass–Steagall's dismantling).

65. See *Sec. Indus. Ass'n v. Clarke*, 885 F.2d 1034, 1046 (2d Cir. 1989) (explaining that the Comptroller had determined that a bank “will not be tempted to make unsound loans to improve the success of [its] securities offerings”). The Comptroller expressed confidence in the market's self-policing abilities by stating that the Bank would have difficulty marketing poor quality loans. *Id.*

66. See Ferrara, *supra* note 61, at 616 (explaining that regulatory erosion of Glass–Steagall made the restrictions that remained ineffective in separating sectors).

investment banking under one roof.<sup>67</sup> Repeal of traditional restrictions on interstate banking and the decline of antitrust enforcement also helped set the stage for waves of mergers that caused enormous growth in the size of the largest institutions.<sup>68</sup>

Deregulation of mortgage lending itself also played a key role. Most of the subprime loans at the heart of the crisis were adjustable rate mortgages (ARMs), consisting of a low introductory teaser rate that later reset at a higher rate determined by an index.<sup>69</sup> As part of President Reagan's "comprehensive program of financial deregulation" Congress and the Comptroller of the Currency made the deregulatory decisions that legalized these hitherto illegal risky loans in the early 1980s.<sup>70</sup>

In the years prior to 2008, issuing of ARMs to subprime borrowers took off.<sup>71</sup> Numerous institutions, including many of the too-big-to-fail institutions, packaged these subprime loans into derivative securities, including collateral debt obligations (CDOs), which were frequently derived from mortgages along with other forms of debt, and collateral mortgage obligations (CMOs), derived from mortgages alone.<sup>72</sup> Two government-sponsored entities (GSEs), Fannie Mae and Freddie Mac, pioneered securitization in the 1970s as a way to enable low income borrowers to purchase homes.<sup>73</sup> Private financial institutions competed with them vigorously in the 1990s, partially by securitizing subprime loans that could not meet the GSEs' underwriting standards.<sup>74</sup>

When derivatives began to take off the enormous financial institutions with an interest in derivatives' growth lobbied to prevent their regulation.<sup>75</sup> They succeeded, first in dissuading the Commodity Future Trading Commission (CFTC) from regulating

67. See William Spencer Topham, *Re-regulating "Financial Weapons of Mass Destruction," Observations on Repealing the Commodity Futures Modernization Act and Future Derivative Regulation*, 47 WILLAMETTE L. REV. 133, 139 (2010) (noting that many regulators attribute the creation of too-big-to-fail institutions to Glass-Steagall's repeal).

68. See Geoffrey P. Miller, *Legal Restrictions on Bank Consolidation: An Economic Analysis*, 77 IOWA L. REV. 1083, 1084 (1992) (mentioning the dismantling of legal restrictions that limited banks' territory as spurring consolidation within the industry); Peter S. Carstensen, *Public Policy Toward Bank Mergers: The Case for Concern*, 49 OHIO ST. L.J. 1397, 1397-98 (1989) (mentioning the increase in interstate combinations in light of the decline of legal prohibitions on interstate banking); Robert DeYoung et al., *Mergers and Acquisitions of Financial Institutions: A Review of the Post-2000 Literature*, 36 J. FIN. SERV. RES. 87, 88 (2009) (describing the consolidation of banking in the 1980s as in part a product of deregulation); Simon H. Kwan & James A. Wilcox, *Hidden Cost Reductions in Bank Mergers*, in 19 RESEARCH IN FINANCE 109 (2002).

69. MARK ZANDI, *FINANCIAL SHOCK: A 360° LOOK AT THE FINANCIAL CRISIS* 42 (2009) (describing teaser rates).

70. See SIMON JOHNSON & JAMES KWAK, *13 BANKERS: THE WALL STREET TAKEOVER AND THE NEXT FINANCIAL MELTDOWN* 72 (2010) (discussing Congress's passage of the Garn-St. Germain Depository Institutions Act in 1982 and the Office of the Comptroller of the Currency's move to lift restrictions on loan-to-value ratios, maturities, and amortization schedules in 1983).

71. See Janice K. McClendon, *The Perfect Storm: How Mortgage Backed Securities, Federal Deregulation, and Corporate Greed Provide a Wake-Up Call for Reforming Executive Compensation*, 12 U. PA. J. BUS. L. 131, 147 (2009) (noting a 292% increase in the number U.S. subprime mortgages issued from 2003 to 2007).

72. See Richard E. Mendales, *Fitting an Old Tiger With New Teeth: Protecting Public Employee Funds Investing in Complex Financial Instruments*, 96 MARQ. L. REV. 241, 256-62 (2012) (defining these instruments and discussing their history).

73. See NATIONAL COMMISSION, *supra* note 56, at 39 (noting that Fannie and Freddie held or securitized mortgages that they purchased).

74. *Id.* at 68; see also Born, *supra* note 56, at 234 (noting that the Fed "was well aware" of declining underwriting standards but did nothing about it).

75. See TETT, *supra* note 56, at 29-40 (describing the genesis of the industry lobbying effort against derivatives regulation).

derivatives and then in cementing their victory by persuading Congress to generally strip the CFTC of its authority to regulate derivatives in the future and to preempt a centuries old common law rule preventing the enforcement of speculative derivatives contracts.<sup>76</sup>

All of this deregulation set the stage for a debacle.<sup>77</sup> Subprime lenders ramped up their practice of offering risky and expensive ARMs to those least able to pay, knowing that they could sell them to larger financial institutions, who would bundle them into derivatives securities for sale around the world.<sup>78</sup> Underwriting standards began to decline, since subprime lenders off-loaded much of the default risk onto investors through securitization.<sup>79</sup> The derivatives sector had a value of about \$36 trillion in 2007, about 259% of GDP, a size that makes the entire economy dependent on this one sector's continuing economic health.<sup>80</sup>

In 2007, high default rates in the subprime lending sector caused a collapse of that sector.<sup>81</sup> This collapse occurred in part because housing prices declined, making banks reluctant to refinance ARMs given to low-income buyers.<sup>82</sup> Accordingly, their loans reset at high rates, which they often could not pay when the teaser rate expired.<sup>83</sup> This collapse did not immediately cause a major decline in the United States or the global economy because the subprime sector by itself was not large enough to have a very great impact.<sup>84</sup> The transmission of risk through securitization and the involvement of too-big-to-fail institutions, however, caused a financial meltdown on a global scale in 2008.<sup>85</sup> The largest financial institutions had become big players in creating, buying, and selling derivative securities.<sup>86</sup> Indeed, some of them had purchased subprime lenders in order to have a ready

76. See *Inv. Co. Inst. v. U.S. Commodity Futures Trading Comm'n (CFTC)*, 891 F. Supp. 2d 162, 171 (2013) (explaining that the Commodity Futures Modernization Act generally stripped the CFTC and the SEC of authority to regulate derivatives); NATIONAL COMMISSION, *supra* note 56, at 46–48 (noting the CFTC's 1993 decision to exempt over-the-counter derivatives from various requirements and the swift congressional response when the CFTC proposed to revisit that decision in 1998); Lynn A. Stout, *Derivatives and the Legal Origin of the 2008 Credit Crisis*, 1 HARV. BUS. L. REV. 1, 3–4 (2011) (explaining that the CFMA removed centuries old restraints on derivatives trading); see also Born, *supra* note 56, at 235–36 (discussing failure to impose and enforce disclosure requirements on securitizers).

77. See *CFTC*, 891 F. Supp. 2d at 172, 192 (explaining that the unchecked growth of derivatives trading in the wake of deregulation produced a fivefold increase in the derivatives market's size and contributed to the "unraveling of [the] . . . financial sector").

78. See NATIONAL COMMISSION, *supra* note 56, at 12 (discussing the largest subprime lenders' reliance on fraudulent loans in light of the ability to sell them off); ZANDI, *supra* note 69, at 38 (pointing out that ARMs make up three-quarters of subprime loans).

79. See ZANDI, *supra* note 69, at 33, 97–99 (describing the decline in underwriting standards for home loans and other types of loans).

80. JOHNSON & KWAK, *supra* note 70, at 59.

81. See NATIONAL COMMISSION, *supra* note 56, at 22 (pointing out that by the end of 2007 most of the subprime lenders had failed or been acquired).

82. See Steven L. Schwarcz, Essay, *Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown*, 93 MINN. L. REV. 373, 378 nn.27–28 (2008) (noting the difficulties encountered by subprime borrowers who sought to refinance in 2007).

83. See Steven L. Schwarcz, *Understanding the Subprime Financial Crisis*, 60 S.C. L. REV. 549, 551–52 (2009) (stating that subprime borrowers who could not refinance were "more likely" to default on their loans).

84. See KRUGMAN, *supra* note 5, at 180 (describing the economic decline through 2007 and most of 2008 as "fairly modest").

85. See Brooksley Born, *Financial Reform and the Causes of the Financial Crisis*, 1 AM. U. BUS. L. REV. 1, 3 (2011) (citing too-big-to-fail institutions and systemic risk as causes of the financial crisis).

86. See, e.g., Ferrara, *supra* note 61, at 601 (pointing out that Merrill Lynch offers mortgages as well as securities underwriting).

source of loans to securitize.<sup>87</sup> As a result of securitization, the collapse of the subprime lending sector threatened the existence of absolutely enormous financial institutions in 2008.<sup>88</sup> Regulators became acutely aware of this when asset prices sharply declined after Lehman Brothers' collapse.<sup>89</sup> That collapse generated a global credit freeze threatening the entire economy, as financial institutions recognized that they could not count on their counterparts to repay their loans.<sup>90</sup> After that, regulators became dedicated to ensuring that no systemically important financial institution failed.<sup>91</sup> This policy, adopted in varying forms around the world, helped prevent a serious financial debacle from becoming much worse.<sup>92</sup>

Thus, deregulation provided an essential prerequisite for the crisis.<sup>93</sup> Without it, subprime loans in the form of ARMs, too-big-to-fail institutions, and a huge unregulated derivatives market would not have been possible.<sup>94</sup>

Neoclassical law and economics scholars actively sought this deregulation with arguments that combined law and economics precepts with the ideological view they support: markets regulate themselves. For example, William Shuggart, writing in the *Cato Journal*, supported Glass–Steagall's repeal on the grounds that it imposes costs with “no

87. See Patricia McCoy et al., *Systemic Risk Through Securitization: The Result of Deregulation and Regulatory Failure*, 41 CONN. L. REV. 1327, 1354 (2009) (discussing Citibank's purchase of the subprime lender Argent Mortgage as an example of major banks' “heavy inroads” into the low and no-documentation loan business).

88. See, e.g., JOHNSON & KWAK, *supra* note 70, at 168 (noting Bank of America's survival was jeopardized when it purchased Merrill Lynch's subprime lending risk).

89. See KRUGMAN, *supra* note 5, at 178 (describing the fall of Lehman Brothers as the “triggering event” for a rapid decline in asset prices and a freeze-up of credit); POSNER, *supra* note 57, at 41–42 (noting that the government had thought the financial system stable in early September of 2008, but that a collapse followed the failure to save Lehman Brothers).

90. See Mendales, *supra* note 72, at 282 (acknowledging the global credit freeze and financial institutions' reluctance to deal with one another).

91. See JOHNSON & KWAK, *supra* note 70, at 167.

92. See C.M.A. McCauliff, *Didn't Your Mother Teach You to Share?: Wealth, Lobbying and Distributive Justice in the Wake of the Economic Crisis*, 62 RUTGERS L. REV. 383, 429 (2010) (noting the U.S. government bailout “averted” a “financial crisis”); see also Editorial, *Closing the Gaps, The Cautionary Tale of AIG's Downfall*, WASH. POST (Jan. 1, 2009), <http://www.washingtonpost.com/wp-dyn/content/article/2008/12/31/AR2008123102771.html> (indicating that a failure to bail out American International Group would “cause its giant web of credit-default swaps” to collapse bringing the “entire world economy” down with it); Jerry W. Markham, *Merging the SEC and CFTC—A Clash of Cultures*, 78 U. CIN. L. REV. 537, 546, 546 n.43 (2009) (stating that the U.K. government nationalized and rescued several banks to prevent widespread panic). *But cf.* Colleen Baker, *The Federal Reserve as Last Resort*, 46 U. MICH. J.L. REFORM 69, 77 (2012) (arguing that bailouts create “moral hazards” which undermine stability and create risks of future financial crises).

93. See John C. Coffee, Jr. & Hillary Sale, *Redesigning the SEC: Does the Treasury Have a Better Idea?*, 95 VA. L. REV. 707, 782 (2009) (concluding that deregulation was the “principal cause” of the 2008 financial crisis); Brett McDonnell, *Dampening Financial Regulatory Cycles*, 65 FLA. L. REV. 1597, 1626 (2013) (suggesting deregulation was a “major cause” of the 2008 financial crisis).

94. See Shah Gilani, *How Deregulation Eviscerated the Banking Sector Safety Net and Spawned the U.S. Financial Crisis*, MONEYMORNING.COM (Jan. 13, 2009), available at <http://www.istockanalyst.com/article/viewarticle/articleid/2948569> (stating that deregulation spawned the subprime mortgage market, the accumulation of bad assets in enormous financial institutions, and ultimately, the financial crisis); Stout, *supra* note 76, at 3–4 (arguing that the CFMA, which removed constraints on derivatives trading, caused the 2008 Financial Crisis).

apparent benefits for depositors.”<sup>95</sup> He reached the conclusion that separation of commercial banking from investment banking generates no benefits through traditional neoclassical assumptions of rationality.<sup>96</sup> For example, he dismissed the argument that combining these functions encourages financial institutions to invest in risky securities that they underwrite or make unnecessarily risky loans (both of which led to the crisis of ‘08) by assuming that “a profit maximizing commercial bank undertakes investments in such a way that the ex ante risk adjusted rate of return . . . is at a maximum.”<sup>97</sup>

Similarly, Geoffrey Miller, a University of Chicago Law Professor, defended bank consolidation and the demise of interstate banking restrictions, which paved the way to consolidation.<sup>98</sup> He predicted (wrongly) that “geographically diversified banking . . . would enhance the safety and soundness of the banking industry.”<sup>99</sup> But he focused on a case for mergers as “efficient,” predicated on the assumption that if banks favor mergers they are likely to be efficient, thus echoing Posner and Bork’s pioneering law and economics antitrust work.<sup>100</sup> He concluded that nobody has shown that the costs of “nationwide branch banking” outweigh the benefits.<sup>101</sup> Although this Article constitutes a thoughtful analysis by a very informed academic, it ends up blending technocratic argument based on efficiency-based thinking with the free market ideology this sort of thinking often supports. He chided Arthur Wilmarth for “distrust of markets” and pointed out that “market forces together with technological innovation” drive banking’s geographic expansion.<sup>102</sup> Then, in a declaration of the true faith, he wrote: “For too long the regulatory system has impeded” market forces.<sup>103</sup> “[I]f interstate branching is economically efficient, it will benefit banking consumers and survive the rigors of competition; if not, it will not flourish.”<sup>104</sup> He concluded: “Markets, not politicians or bureaucrats, should decide the future structure of the banking . . . industry.”<sup>105</sup> In other words, markets self-correct, so no need for regulation exists.

Daniel R. Fischel, then the director of the University of Chicago Law and Economics Program, echoed these views in supporting the demise of Glass–Steagall in 1987.<sup>106</sup> He (with two co-authors) argued that the concerns about conflicts of interest that underlay Glass–Steagall were misguided, because reputational concerns would lead banks to police

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95. See William F. Shughart II, *A Public Choice Perspective of the Banking Act of 1933*, 7 CATO J. 595, 612 (1988).

96. *Id.* at 612–13.

97. *Id.* at 605.

98. See Miller, *supra* note 68, at 1086 (characterizing the case for eliminating geographic restrictions on banking as clear cut).

99. *Id.*

100. See *id.* at 1097–1102 (arguing that markets will self-correct if mergers prove inefficient). He does, however, predicate his claim that large banks are not prone to failure on empirical evidence. See *id.* at 1102–05 (discussing past failure rates of different sized banks, other countries’ experience, and some anecdotal evidence).

101. See *id.* at 1108 (stating that Professor Wilmarth, an opponent of financial consolidation, has not shown that the costs outweigh the benefits).

102. *Id.* at 1131.

103. Miller, *supra* note 68, at 1131.

104. *Id.*

105. *Id.*

106. See Daniel R. Fischel et al., *The Regulation of Banks and Bank Holding Companies*, 73 VA. L. REV. 301, 305 (1987) (articulating a thesis opposed to many of the restrictions in Glass–Steagall).

themselves.<sup>107</sup> Once again, a rational actor assumption leads to the conclusion that markets regulate themselves.

After derivatives trading took off and bankrupted Orange County, California and Barings Bank, neoclassical economists rushed to defend derivatives against calls for their regulation. A Cato Institute policy analysis from a time when the CFTC showed some interest in regulating derivatives, for example, made the case for derivatives as a tool increasing market efficiency and then advocated “greater reliance on market forces” and self-regulation rather than on government restrictions of derivatives trading.<sup>108</sup> A year later, Congress followed this advice and instituted a moratorium on regulation soon followed by the permanent stripping of authority mentioned earlier.<sup>109</sup>

Neither I nor the economists who list neoclassical economics (or in my case, neoclassical law and economics) as *a* cause of the economic crisis claim that it is the *only* cause.<sup>110</sup> For example, lobbying by financial firms certainly contributed to the deregulation that sparked the crisis.<sup>111</sup> But one cannot completely separate lobbying from neoclassical law and economics. The Glass–Steagall regime, when it was in place, divided the special interests.<sup>112</sup> Some had a financial interest in keeping Glass–Steagall in place and others had an interest in eroding its strictures.<sup>113</sup> So lobbying’s existence cannot constitute a sufficient explanation for Glass–Steagall’s erosion. As we have seen, neoclassical economic thinking’s optimism about markets undergirded the erosion. Once Glass–Steagall eroded and then fell, large financial institutions became much wealthier and much more unified in supporting deregulation.<sup>114</sup> Furthermore, as many scholars have pointed out, public choice theory—which emphasizes the role of special interest lobbying—cannot by itself provide a complete explanation for public policy choices.<sup>115</sup> We know that ideas and popular interests sometimes matter; scholars often cite environmental law, civil rights

107. See *id.* at 324–25 (finding that reputational concerns would minimize incentives to offer customers misleading information in order to promote other lines of business).

108. Thomas F. Siems, *Cato Policy Institute Analysis No. 283: 10 Myths About Financial Derivatives*, CATO INSTITUTE (Sept. 11, 1997), <http://www.cato.org/pubs/pas/pa-283.html>.

109. See Markham, *supra* note 92, at 581–82 (describing the regulatory moratorium and the CFMA’s effects).

110. See, e.g., STIGLITZ, *supra* note 4, at 12 (blaming deregulation on a combination of special interest lobbying and “ideas that said regulation was not necessary”).

111. See Sewell Chan, *The Financial Crisis was Avoidable*, N.Y. TIMES, Jan. 26, 2011, at A3 (noting that the financial sector invested \$2.7 billion between 1999 and 2008 in lobbying); Stavros Gadinis, *From Independence to Politics in Financial Regulation*, 101 CAL. L. REV. 327, 349 (2013).

112. See Macey, *supra* note 63, at 715–17 (discussing the “political equilibrium” that kept Glass–Steagall in place for many years, including litigation by the securities industry opposing Glass–Steagall’s erosion).

113. See Fischel et al., *supra* note 106, at 333 (noting that bank holding companies and local banks lobbied “for and against interstate banking proposals”).

114. See Karmel, *supra* note 64, at 7–8 (stating that deregulation paved the way for massive institutions, like Citigroup, to challenge Congress to get rid of Glass–Steagall once and for all).

115. See, e.g., Donald C. Langevoort, *The SEC as a Bureaucracy: Public Choice, Institutional Rhetoric, and the Process of Policy Formulation*, 47 WASH. & LEE L. REV. 527, 529 (1990) (stating that public choice theory’s emphasis on “external stimuli” does not adequately explain the SEC’s behavior); Jonathan R. Macey, *Administrative Agency Obsolescence and Interest Group Formation: A Case Study of the SEC at Sixty*, 15 CARDOZO L. REV. 909, 917–18 (1994) (arguing that the SEC acts with the goal of preserving the organization in the face of obsolescence).

law, and the 1986 tax reforms as examples of laws that defy a public choice explanation.<sup>116</sup> Financial firms' lobbying proved successful in part because the deregulation they advocated seemed sensible to many policymakers.<sup>117</sup> The top people in many regulatory agencies come from Wall Street, a place where the efficient market hypothesis and the kind regard for markets it supports has some influence.<sup>118</sup> Neoclassical law and economics certainly contributed to the acceptance of the deregulatory measures that made the crisis possible.<sup>119</sup>

### C. The Posner Defense

Richard Posner's post-crisis work seeks to separate neoclassical law and economics from deregulatory ideology. He characterizes the financial crisis as involving a depression and acknowledges that it constitutes a failure of capitalism.<sup>120</sup> He even states that deregulation played a role in establishing the preconditions for that failure, as I have argued, and calls for at least somewhat stricter financial regulation.<sup>121</sup>

But he blames deregulation on free market ideology, specifically the belief that markets self-regulate, a belief, he argues, that many leading economists share with policymakers and business leaders.<sup>122</sup> At the same time, he defends rational actor assumptions and CBA.<sup>123</sup> In this way, he tries to decouple neoclassical law and economics from deregulatory ideology.

The material provided above shows why Posner's effort to decouple free market ideology from neoclassical law and economics fails. The ideas that neoclassical law and economics rests upon, namely, the assumptions of perfect information and rational market actors, support a presumption in favor of unfettered markets and therefore provide intellectual support for free market ideology, including the notion that markets self-

116. See David M. Driesen, *Purposeless Construction*, 48 WAKE FOREST L. REV. 1, 130–32 (2013) (describing public choice theory's limits); William N. Eskridge, Jr., *Politics Without Romance: Implications of Public Choice Theory for Statutory Interpretation*, 74 VA. L. REV. 275, 321 (1988) (finding that public choice theory does not explain the Civil Rights Act of 1964, environmental law, or the 1986 Tax Reform Act); Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 571 (2001) (finding it difficult to square environmental law's existence with public choice theory).

117. NATIONAL COMMISSION, *supra* note 56, at xviii (concluding that financial regulators chose a "hands-off approach" due to their "widely accepted faith in the self-correcting nature of the markets").

118. See TETT, *supra* note 56, at 39–40 (linking the success of industry lobbying on derivatives to Clinton Administration officials' Wall Street ties and their own belief in the desirability of avoiding regulation); Topham, *supra* note 67, at 141–42 (attributing the "deregulatory zeal" of President Clinton's working group that recommended exemption of derivatives to Wall Street ties and to the efficient market hypothesis).

119. See Topham, *supra* note 67, at 133 (characterizing Glass–Steagall's repeal and ending derivatives regulation as results of the efficient market hypothesis and the capital asset pricing model).

120. RICHARD A. POSNER, *A FAILURE OF CAPITALISM: THE CRISIS OF '08 AND THE DESCENT INTO DEPRESSION IX*, 236 (2009).

121. See *id.* at 106–07, 242–43 (arguing for financial regulation and stating that government "inaction" contributed to the crisis); POSNER, *supra* note 57, at 13 (stating that deregulation helped cause the economic collapse by making banking "unsafe"); *cf.* POSNER, *supra* note 120, at 116 (worrying that financial crisis may cause a "swing to excessive regulation"); POSNER, *supra* note 57, at 193–209 (arguing against proposals to make originators of mortgages maintain a minimum equity interest after securitization, oversee credit rating agencies, and establish a consumer financial protection agency).

122. See POSNER, *supra* note 120, at 243, 248, 259, 270–71.

123. See *id.* at 100 (summarizing Posner's account of crisis' causes as dependent on "no psychological factors" but on a story of rational responses to uncertainty).



regulate. The efficient market hypothesis provides additional (and related) support for the belief in markets' capacity to self-regulate. Furthermore, we saw that some regulatory decisions, like the decision to allow banks to simultaneously originate and securitize loans, relied on the neoclassical model. In short, neoclassical law and economics has a close relationship to the belief that markets self-regulate often enough to create a presumption against regulation.<sup>124</sup> Finally, we have seen that law and economics scholars recommended deregulation, combining the sort of technocratic efficiency arguments Posner has advocated throughout his career with endorsements of the ideological stance the technocratic arguments support. Although Posner himself may not be an ideologue, the neoclassic theory of law and economics played a key role in providing intellectual support for free market ideologues and other policymakers carrying out a disastrous campaign of deregulation. Free market ideology and technocratic law and economics have a very close relationship. In any case, much of this deregulation enjoyed support too widespread to be blamed wholly on non-technocratic ideologues.<sup>125</sup> Glass-Steagall's repeal, for example, enjoyed the support of President Clinton and a nearly unanimous Congress.<sup>126</sup>

Much of Posner's work on the financial crisis, however, distracts the reader from neoclassical law and economics' failure as a legal theory, by focusing on neoclassical economics' value as a tool for describing market behavior. He does this by adopting a very capacious view of rationality and by shifting his focus institutionally to create an apparently plausible case for a rational actor model as a predictive tool where none appears to exist. Jonathan Macey and James Holdcroft describe the large banks' tendency to mimic each other's pursuit of profits from derivatives in the face of mounting evidence of rising default rates as "lemming"-like, thereby suggesting irrationality or at least bounded rationality.<sup>127</sup> Richard Posner, however, recasts this same behavior as an example of rational behavior by focusing primarily upon actors within the firm.<sup>128</sup> He cites the problem of inexperienced traders having too much enthusiasm for the newfangled securities, even while conceding that at least in some cases (and perhaps many) the direction to ramp up risk came from "senior management."<sup>129</sup> He says that firms tend to pay more attention to their traders'

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124. See C. Edwin Baker, *Starting Points in the Economic Analysis of Law*, 8 HOFSTRA L. REV. 939, 960 n.71 (1980) (discussing the law-and-economic literature's "consistent tendency to favor private property, free contract legal responses").

125. See Eric A. Posner & E. Glen Weyl, *An FDA for Financial Innovation: Applying the Insurable Interest Doctrine to 21<sup>st</sup>-Century Financial Markets*, 107 NW. U. L. REV. 1307, 1309 (2013) (claiming that a political and scholarly consensus supported deregulation of financial markets prior to the financial crisis); cf. Arthur E. Wilmarth, Jr., *The Transformation of the U.S. Financial Services Industry 1975-2000: Competition, Consolidation, and Increased Risks*, 2002 U. ILL. L. REV. 215, 476 (finding that in the wake of deregulation, financial institutions became too complex and large and have not been effectively regulated).

126. Lawrence G. Baxter, *Betting Big: Value, Caution and Accountability in an Era of Large Banks and Complex Finance*, 31 REV. BANKING & FIN. L. 765, 794 (2012) (noting that President Clinton signed the law repealing Glass-Steagall and that politicians on "both sides of the aisle" applauded this result).

127. See Jonathan R. Macey & James F. Holdcroft, Jr., *Failure Is an Option: An Ersatz-Antitrust Approach*, 120 YALE L.J. 1368, 1383 (2011) (describing large banks as like lemmings because of their tendency to mimic each other's "bad bets").

128. See POSNER, *supra* note 120, at 77 (expressing skepticism that financial managers' rationality failures explain the crisis and substituting a "narrative" of "intelligent businessmen rationally responding to their environment").

129. See *id.* at 80-81 (describing a situation where senior management of Citigroup made the decision to increase risk).

views than to those of their risk managers because trading serves as a profit center.<sup>130</sup> He does not explain why paying more attention to the views of people generating profits than to those who help one avoid losses is rational in the face of mounting evidence pointing toward pending losses; indeed, some firms did adjust their behavior to avoid losses or realize profits from the subprime lending debacle.<sup>131</sup> He also suggests that communication problems may have prevented the word from reaching senior management, a point surely at odds with the perfect information assumption in neoclassical economics and seemingly at odds with his own assumption that managers must have known about the potential for a housing bubble to burst.<sup>132</sup> He discusses the problems of properly understanding complex derivatives, a problem that seems to suggest a model of bounded rationality, accepting that people do not have enough time or capacity to understand overly complex financial instruments.<sup>133</sup> He characterizes the tendency to “follow the herd” as rational behavior and therefore sees bubbles as “rational responses to uncertainty.”<sup>134</sup> He also treats the panicked reaction of investors in economic collapses as a rational response to uncertainty.<sup>135</sup> Charles Kindleberger, one of the leading economic historians of bubbles, expressed very different views, seeing the herd-like tendencies that tend to create excessive optimism as bubbles develop and panic precipitating crashes as examples of irrationality, which economists assume away by employing neoclassical models.<sup>136</sup> Posner may be correct to claim that his arguments show that the line between rationality and irrationality blurs.<sup>137</sup> But the world he describes fits the new institutionalist model of bounded rationality and limited information very well. He has to stretch the rational actor model beyond its typical bounds to make it fit his observations.<sup>138</sup> Indeed, his view makes any human behavior short of outright insanity fit the rational actor model.<sup>139</sup>

This capaciousness, however, destroys the arguments that Posner and others have typically used to support the idea that they can predict the efficiency of legal rules when

130. *Id.*

131. See TETT, *supra* note 56, at 140 (explaining that Jamie Dimon, JPMorgan Chase’s CEO, backed staff who believed that derivatives of mortgages were too risky).

132. POSNER, *supra* note 120, at 77–78, 80–81 (claiming that managers must have been aware of the housing bubble discussed in the financial press and elsewhere, but that problems of “communication and control” may have contributed to taking on additional risk anyway).

133. See *id.* at 81–82 (describing the effect of complex instruments on financial organizations); see also Steven L. Schwarcz, *Rethinking the Disclosure Paradigm in a World of Complexity*, 2004 U. ILL. L. REV. 1, 11–13 (explaining that disclosure fails because people cannot understand complex structures).

134. See POSNER, *supra* note 120, at 84–85 (describing the tendency to follow the herd as “risky but not irrational” and bubbles as “rational responses to uncertainty”).

135. See Posner, *supra* note 6, at 275 (describing the tendency to “freeze” in response to a sharp downward trajectory as a “rational response”).

136. See CHARLES KINDLEBERGER, *MANIAS, PANICS, AND CRASHES: A HISTORY OF FINANCIAL CRISIS* xiii (1989) (decrying neoclassical economists’ tendency to dismiss conventional descriptions of bubbles’ dynamics as inconsistent with neoclassical economics’ fundamental assumptions); see also Lynn A. Stout, *Why the Law Hates Speculators: Regulation and Private Ordering in the Market for OTC Derivatives*, 48 DUKE L.J. 701, 755–56 (1999) (explaining the tension between bubbles and the predominant microeconomic theories); cf. Posner, *supra* note 6, at 276 (acknowledging that characterizing herd behavior as rational constitutes at least slightly revisionist economics).

137. See POSNER, *supra* note 120, at 85 (describing the “line between the rational and the irrational” as “unclear”).

138. See Zachary J. Gubler, *Public Choice Theory and the Private Securities Market*, 91 N.C. L. REV. 745, 773 (2013) (characterizing Richard Posner as backing off “rational actor” assumptions in response to the crisis).

139. See POSNER, *supra* note 57, at 31 (noting that his approach accepts the teachings of behavioral finance).

lacking the data necessary to conduct a reliable CBA. That idea, as we have seen, is that market actors' rationality will generally lead to bargains producing efficient outcomes. If, however, our conception of rationality expands to embrace the full range of human conduct that might arise among people not demonstrably insane, such as exuberance in the face of rising asset prices and panic as they fall, then we cannot predict that private bargains will prove efficient.<sup>140</sup> Rational actors' bargains will often prove inefficient under Posner's capacious rational actor assumption. Inefficient bargains are especially likely in complex contexts where transactions involve difficult predictions about future events, as in the context of investment, intellectual property, national security, and the natural environment.<sup>141</sup> The financial crisis taught us that private transactions often produce inefficient, indeed disastrous, results.

Although Posner supports some modest near-term regulation, he calls for waiting to enact major structural reforms.<sup>142</sup> Posner wants to wait until we have the information needed to properly assess the costs and benefits of restructuring.<sup>143</sup> When will that day come? My answer is never. We will never know the costs and benefits of any major proposal to restructure the financial industry, for reasons that are important not just to financial regulation, but to the law and economics of complex systems more generally.

## II. COMPLEXITY AND THE IMPOSSIBILITY OF PREDICTING A MEANINGFUL EQUILIBRIUM

Complex systems make it impossible to predict whether a particular legal rule will approximate optimality.<sup>144</sup> Such systems also change so often and unpredictably that any equilibrium would prove temporary and therefore trivial.<sup>145</sup> This section demonstrates these points primarily through discussion of the financial system prior to the crash of 2008, and then explains that other complex systems share the characteristics that defeat optimality, relying on analyses cited in the margins to support my characterizations of non-financial examples more fully than a single Article can.

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140. See, e.g., John C. Coffee, Jr., *Systemic Risk After Dodd-Frank: Contingent Capital and the Need for Regulatory Strategies Beyond Oversight*, 111 COLUM. L. REV. 795, 822–23 (2011) (pointing out that bounded rationality suggests that both private market actors and regulators can misperceive risks and therefore “one needs failsafe remedies”).

141. See SUNSTEIN, *supra* note 21, at 54–57 (discussing findings about people's shortcoming in thinking about the future).

142. See POSNER, *supra* note 120 (describing some “piecemeal reforms” that “may be . . . helpful” but characterizing them as “pretty small beer”).

143. See POSNER, *supra* note 120, at 296 (saying that we “should wait” to adopt major regulatory reforms until “we get a clear idea” of “what the costs would be” after explaining that we do not know how to value the benefits of major reforms).

144. See Bruce Kraus & Connor Raso, *Rational Boundaries for SEC Cost-Benefit Analysis*, 30 YALE J. ON REG. 289, 322–24 (2013) (stating that the financial market's complexities makes quantifying the future costs and benefits of proposed SEC regulations a futile exercise); see also Henry T.C. Hu, Essay, *Misunderstood Derivatives: The Causes of Informational Failure and the Promise of Regulatory Incrementalism*, 102 YALE L.J. 1457, 1480 (1993) (pointing out that financial markets' complexities “overwhelm” experts called upon to make predictions).

145. See generally Kelman, *supra* note 11, at 1220 (suggesting that allocative efficiency may be “relatively trivial” and that its pursuit may “interfere with social welfare gains”).

The financial crisis reminds us that our financial markets are complex, dynamic systems.<sup>146</sup> Lending to subprime borrowers involves a lot of uncertainty.<sup>147</sup> The use of ARMs for this purpose means that the amount of money that our least economically capable borrowers must pay can go up by an unpredictable amount when a teaser rate expires. Neither the lender nor the borrower can predict the precise interest rate that will govern the majority of the loan's term (absent refinancing), which creates risks that either or both will underestimate a loan's cost and therefore overestimate the buyer's capacity to repay the loan.<sup>148</sup> On the other hand, if housing prices rise, borrowers often can refinance, for a fee, and get a new teaser rate.<sup>149</sup> This possibility, however, creates a risk that borrowers and lenders will not take the problem of paying more when an ARM resets to a higher rate seriously enough and therefore agree to imprudent loans.<sup>150</sup> Borrowers' ability to pay can also vary depending on whether they keep their jobs, retain their health, and other variables.<sup>151</sup> Hence, financial markets are complex both in the sense of containing many uncertainties and of having a large number of potentially relevant (and often uncertain) variables influence outcomes.<sup>152</sup>

Financial markets also contain many feedback loops, so that one part of the system can produce an effect in another part that exacerbates the problem in part one.<sup>153</sup> So, for example, declining housing prices make refinancing impossible, thereby causing ARMs to reset at a higher rate, triggering more defaults.<sup>154</sup> The defaults produce abandoned and foreclosed homes, creating a glut of houses for sale causing further price declines.<sup>155</sup> Thus, price declines create a feedback loop that causes additional price declines.<sup>156</sup>

This sort of complex system often operates in a non-linear fashion rather than in a smooth predictable manner.<sup>157</sup> Financial markets, for example, can spike upward or drop

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146. See Baxter, *supra* note 126, at 867 (characterizing the financial markets as “dynamic” and “complex”).

147. See Kathleen C. Engel & Patricia A. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 *FORDHAM L. REV.* 2039, 2048–54 (2007) (listing subprime lending's inherent uncertainties).

148. See William N. Eskridge, Jr., *One Hundred Years of Ineptitude: The Need for Mortgage Rules Consonant with the Economic and Psychological Dynamics of the Home Sale and Loan Transaction*, 70 *V.A. L. REV.* 1083, 1132 (1984) (stating that nobody knows what the future interest rate will be under an ARM and suggesting that the teaser rate confuses homebuyers); Jo Carillo, *Dangerous Loans: Consumer Challenges to Adjustable Rate Mortgages*, 5 *BERKELEY BUS. L.J.* 1, 21 (2008) (stating that teaser rates lure customers with the promise of lower initial monthly payments); cf. Peter W. Salsich, *National Affordable Housing Trust Fund Legislation: The Subprime Mortgage Crisis Also Hits Renters*, 16 *GEO. J. ON POVERTY L. & POL'Y* 11, 22 (2009) (claiming that lenders knew the interest rates ARM borrowers would have to pay when their teaser rates expired).

149. See Jonathan Macey et al., *Helping Law Catch Up to Markets: Applying Broker-Dealer Law to Subprime Mortgages*, 34 *J. CORP. L.* 789, 802 (2009) (pointing out that prior to 2008 rising housing prices allowed borrowers to refinance and thus shielded them from skyrocketing rates).

150. See Oren Bar-Gill & Elizabeth Warren, *Making Credit Safer*, 157 *U. PA. L. REV.* 1, 53–54 (2008) (suggesting that borrowers enter into ARMs without fully understanding refinancing and its “complexity”).

151. See *id.* at 53 (stating that borrowers frequently misestimate the costs of refinancing and overestimate their ability to refinance).

152. See J.B. Ruhl, *Managing Systemic Risk in Legal Systems*, 89 *IND. L.J.* 559, 567 (2004) (defining complexity in part by the existence of a multitude of interacting components).

153. See Judge, *supra* note 1, at 710 (explaining the feedback loop that caused the 2008 financial crisis).

154. *Id.* at 709–10.

155. See *id.* at 710 (explaining that foreclosed homes cause prices to fall further).

156. *Id.*

157. See POSNER, *supra* note 57, at 2–3 (noting that markets move in “irregular, unpredictable fashion” not in a “smooth wavelike motion”).

precipitously owing to irrational exuberance or panic in response to evolving financial conditions.<sup>158</sup> These movements prove difficult to predict.<sup>159</sup>

This complexity makes reasonably reliable quantitative prediction impossible.<sup>160</sup> Financial models helped convince financial institutions, wrongly as it turns out, that they could manage subprime lending risks.<sup>161</sup> Using historical data about default rates, they could estimate how high an interest rate they should charge in order to compensate themselves for default risks.<sup>162</sup> Any mathematical model makes simplifying assumptions in order to make prediction appear possible.<sup>163</sup> A very common assumption is that the future will closely resemble the present.<sup>164</sup> This assumption makes it possible to use data, which exist (if they exist at all) for the past only, not for the future. In the case of mortgage lending some financial institutions modeled deviations from the immediate past, namely the possibility of localized declines in housing prices.<sup>165</sup> But none of the modelers looked at a nationwide decline in housing prices because we have no data about such a rare event.<sup>166</sup> Nor did any of the models consider the possibility of declining underwriting standards because this problem developed fairly late in the game and did not yield statistical data.<sup>167</sup> Data about the past rarely yield mathematically accurate predictions of the future for complex systems.<sup>168</sup> Although minor variations do not necessarily make

158. See generally GEORGE A. AKERLOF & ROBERT J. SHILLER, *ANIMAL SPIRITS: HOW HUMAN PSYCHOLOGY DRIVES THE ECONOMY, AND WHY IT MATTERS FOR GLOBAL CAPITALISM* 3–4 (2009) (arguing that “animal spirits,” as opposed to rationality, influence decisions and drive financial events).

159. See Erik F. Gerding, *Code, Crash, and Open Source: The Outsourcing of Financial Regulation to Risk Models and the Global Financial Crisis*, 84 WASH. L. REV. 127, 177 (2009) (stating that a “lack of defined boundaries to behavioral biases” injects uncertainty into risk modeling).

160. See *id.* at 178–79 (noting that financial markets’ “nonlinear behavior . . . bouts of disequilibrium, and unpredictable swings” set predictive models up for “spectacular failures”); Richard A. Posner, *Keynes and Coase*, 54 J.L. & ECON. S31, S36 (2013) (characterizing “[t]he interrelations of money, interest rates, savings, investment, employment, public finance, and production” as “too complex to be modeled fruitfully”).

161. See Kathleen C. Engel & Patricia A. McCoy, *A Tale of Three Markets: The Law and Economics of Predatory Lending*, 80 TEX. L. REV. 1255, 1284–85 (2002) (explaining how financial models derived from the capital asset pricing model helped persuade the largest financial institutions to participate in selling ARMs to subprime borrowers).

162. See Gerding, *supra* note 159, at 146–47 (pointing out that regulators took a hands off approach when dealing with subprime mortgage lenders because regulators assumed lenders accurately managed risks using “advanced” models to maximize profits).

163. See Michael O. Finkelstein, *Regression Models in Administrative Proceedings*, 86 HARV. L. REV. 1442, 1444 (1973) (noting that all mathematical models are susceptible to criticism for utilizing simplified assumptions).

164. See, e.g., Wilmarth, *supra* note 125, at 343–44 (describing the Black–Sholes model’s assumptions that future volatility resembles past volatility as creating “potential for serious error”).

165. See, e.g., TETT, *supra* note 56, at 68 (explaining that modelers at JPMorgan Chase modeled the Texas housing market as a way of examining potential risks).

166. See *id.* at 67–68 (explaining that the lack of data on nationwide declines in housing prices imposed limits on modeling); cf. Geoffrey P. Miller & Gerald Rosenfeld, *Intellectual Hazard: How Conceptual Biases in Complex Organizations Contributed to the Crisis of 2008*, 33 HARV. J.L. & PUB. POL’Y 807, 821 n.38 (2010) (stating that modelers treated the disastrous results from a housing price decline as a negligible risk).

167. See TETT, *supra* note 56, at 251 (discussing the problem of originating too many subprime mortgages on “increasingly silly terms” while using models deemphasizing the “human issues”); Miller & Rosenfeld, *supra* note 166, at 822–23 (arguing that banks’ blind reliance upon academics’ models, which ignore strategic behavior, had disastrous consequences).

168. See TETT, *supra* note 56, at 252 (chiding bankers for “treat[ing] their mathematical models as if they were an infallible guide to the future, failing to see that these models were based on a ridiculously limited set of

them useless for traders, for legal decision makers models must capture unusual future events to be useful. And that is precisely where models fail.<sup>169</sup>

It is theoretically impossible for a functioning financial market to be in the equilibrium that the neoclassical model of perfect information imagines because financial markets depend on imperfect information for their very existence.<sup>170</sup> Trades arise precisely because buyers and sellers have different views of the future value of financial assets.<sup>171</sup> Thus, the notion of a perfectly efficient market, in this context, constitutes a mirage.

As Richard Posner concedes, in such a dynamic context, policymakers cannot carry out CBA of proposed legal reforms.<sup>172</sup> CBA can handle situations of risk, where probabilities are known, by multiplying potential future costs and benefits by the probability of their occurrence.<sup>173</sup> But where true uncertainty prevails—where probabilities are not known—we cannot calculate future benefits through a probability function.<sup>174</sup>

Posner also notes that economists use two techniques to address true uncertainty and finds neither satisfactory. One involves simply assuming that probabilities are low even when no evidence supports this view.<sup>175</sup> Many economists have done this in addressing the possibility of a climate catastrophe within integrated assessment models designed to model the costs and benefits of mitigating climate disruption.<sup>176</sup> As Posner explained, science provides no basis for assuming that the probability of a climate catastrophe is small.<sup>177</sup> Posner also seems skeptical of the second available technique: expert

data”); Miller & Rosenfeld, *supra* note 166, at 821–22 (indicating financial markets, much like weather systems, are “difficult” to model reliably). Financial institutions, knowing that lending involves some risk, (including some risks that models may miss) tried to reduce their risk by selling CDOs and CMOs to investors. *See ZANDI, supra* note 69, at 116 (noting that in the “originate-to-distribute” model banks “didn’t own the loans” and therefore “didn’t bear the risks” associated with the loans packaged into securities). These sales, of course, increased risks to investors. Securitization does not decrease overall systemic risk; indeed, derivatives trading spreads potentially confined risk throughout the global economy. We saw in the previous section that when housing prices broadly declined and default rates increased, the securitization spread the risks to central financial institutions throughout the world, thereby freezing global credit and reaching the rest of the economy.

169. *See* Wilmarth, *supra* note 125, at 345–46 (describing how financial models dangerously focus risk managers on the probability of loss thereby diverting attention from the “potential magnitude of loss”).

170. *See generally* Sanford J. Grossman & Joseph E. Stiglitz, *On the Impossibility of Informationally Efficient Markets*, 70 AM. ECON. REV. 393 (1980) (explaining that a competitive economy cannot be in equilibrium because information asymmetry and information costs defeat the equilibrium).

171. David M. Driesen & Shubha Ghosh, *The Function of Transaction Cost Minimization in a World of Friction*, 47 ARIZ. L. REV. 61, 86 (2005).

172. *See generally* POSNER, *supra* note 8.

173. Katherine A. Van Tassel & Rose H. Goldman, *The Growing Consumer Exposure to Nanotechnology in Light of Lessons from the Past*, 44 CONN. L. REV. 481, 528 n.251 (2011) (explaining the CBA formula for evaluating policies).

174. *See* Robert W. Hahn & Cass R. Sunstein, *A New Executive Order for Improving Federal Regulation? Deeper and Wider Cost-Benefit Analysis*, 150 U. PA. L. REV. 1489, 1499 n.37 (2002) (calling predictions where probabilities are unknown “stab[s] in the dark”).

175. *See, e.g.*, Miller & Rosenfeld, *supra* note 166, at 821–23 (stating that modelers assigned low probabilities to a declining housing market and other realistic risks in the years leading up to 2008).

176. DOUGLAS A. KYSAR, *REGULATING FROM NOWHERE: ENVIRONMENTAL LAW AND THE SEARCH FOR OBJECTIVITY* 95 (2010) (discussing the “seemingly irresistible tendency among policy analysts to treat radical uncertainty regarding a potentially catastrophic . . . outcome” as low probability).

177. POSNER, *supra* note 8, at 52–53 (explaining that “climatologists cannot . . . assess the probability” of a catastrophe).

elicitation.<sup>178</sup> Although his skepticism is justified, some defense of Posner’s view on expert elicitation seems in order in light of the increasing use of these techniques in recent years.<sup>179</sup> Simply put, where experts know very little, expert elicitation will rarely, if ever, yield a reliable and correct result.

One elicitation technique, called Monte Carlo analysis, merely pushes the uncertainty one step farther back: It assumes that, although nobody knows the true values of key parameters, experts know the probability distribution.<sup>180</sup> Then analysts can perform calculations repeatedly, drawing different values of uncertain parameters from their probability distributions.<sup>181</sup> For example, if you roll two dice once, the sum of the resulting numbers is uncertain; if you roll them many times, the sum of the two numbers averages seven. Monte Carlo analysis is the appropriate technique in cases where, as with a roll of the dice, the specific outcome is uncertain, but we know the probability distribution with certainty.<sup>182</sup> Unfortunately, such cases are quite rare; more often, Monte Carlo analysis hides the arbitrary judgment lurking below the surface of the analysis in the selection of a probability distribution in the teeth of unknown probabilities.<sup>183</sup>

Another expert elicitation technique, called Bayesian probability, is, like Monte Carlo analysis, appropriate under narrowly defined circumstances but vulnerable to abuse when used more broadly.<sup>184</sup> Bayesian analysis begins with the important observation that the best available estimate of the probability of an uncertain event often depends on the extent of relevant prior knowledge and goes on to develop methods for revising probability estimates as knowledge changes.<sup>185</sup> In practice, however, economists often use it to incorporate *ad hoc* estimates from experts in relevant fields.<sup>186</sup> Here the potential for arbitrary judgment enters in the construction of what is called the “Bayesian prior.”<sup>187</sup> At

178. *Id.* at 53.

179. The ensuing discussion of these techniques owes a great deal to Frank Ackerman’s advice.

180. See David M. Driesen, *Cost-Benefit Analysis and the Precautionary Principle: Can They Be Reconciled?*, 2013 MICH. ST. L. REV. 771, 781 (2013) (stating that Monte Carlo analysis assumes that the probability distribution is known even though key parameters are unknown); Douglas A. Kysar, *It Might Have Been: Risk, Precaution, and Opportunity Costs*, 22 J. LAND USE & ENVT’L L. 1, 20 (2006) (stating that Monte Carlo analysis’ dependence on “assumptions about the theoretical nature of unknown probabilities” makes it capable of generating “dramatically erroneous policy advice”); Susan R. Poulter, *Monte Carlo Simulation to Environmental Risk Assessment: Risk, Health, Safety, and the Environment*, 9 RISK 7, 10, 13 (1998) (noting the centrality of the “probability density function” in Monte Carlo Analysis and the possibility of controversy over its selection).

181. Driesen, *supra* note 180, at 781.

182. *Id.*

183. See KYSAR, *supra* note 176, at 93 (noting that applying Monte Carlo analysis to systems governed by the “laws of complexity” can “lead to dramatically erroneous policy advice”).

184. See Stephen Charest, *Bayesian Approaches to the Precautionary Principle*, 12 DUKE ENVTL. L. & POL’Y F. 265, 269–70 (2002) (suggesting that a Bayesian approach is a “sensible” approach to evaluating “a risk with a known probability distribution”).

185. See *id.* at 272–74 (explaining this approach in more detail).

186. See David E. Adelman, *Two Models for Scientific Transparency in Environmental Law*, in RESCUING SCIENCE FROM POLITICS: REGULATION AND THE DISTORTION OF SCIENTIFIC RESEARCH 193, 198 (Wendy Wagner & Rena Steinzor eds., 2006) (describing Bayesian methods as based on “subjective” judgment).

187. See Charest, *supra* note 184, at 201 (pointing out that environmental scientists often differ substantially in judgments about the appropriate Bayesian priors).

its best, this technique grounds a sophisticated statistical methodology; at its worst, it can amount to relabeling idle prejudice or uninformed guesses as “data.”<sup>188</sup>

Absent good data or a solid basis for extrapolation from data, expert calculation of future consequences’ timing and magnitude is unlikely to be very good.<sup>189</sup> Indeed, some economists and a mathematician have argued that for some important types of uncertainty, the Bayesian theory of decision-making may be neither realistic nor necessarily rational.<sup>190</sup>

In cases of true uncertainty, habitually calling probabilities low just because a plausible outcome is disastrous dangerously misleads policymakers.<sup>191</sup> In such cases, using expert elicitation to generate numbers for a CBA misleads policymakers by masking uncertainty with apparently precise numbers that better reflect the chosen expert’s proclivities or the framing of the questions posed than reality.<sup>192</sup>

This problem of complexity making identification of an efficient outcome impossible or arbitrary and unreliable exists not just in the area of finance (as we have seen), but in a lot of other areas as well. Climate disruption is one such area, partly because future warming depends on unpredictable economic growth rates and also because the physical system governing the climate is extremely complex and incompletely understood.<sup>193</sup>

188. See *id.* at 276 (pointing out that many find application of the Bayesian approach to true uncertainty arbitrary). Charest does not dispute this characterization of the Bayesian approach as arbitrary, but essentially argues that such arbitrariness is inevitable when confronting uncertainty. *Id.* at 277.

189. See Timothy M. Lenton et al., *Tipping Elements in the Earth’s Climate System*, 105 PNAS 1786, 1791 (2008) (characterizing the criticism of expert belief as not adding to scientific knowledge when not verified by data or theory as a “general criticism” from a natural science perspective).

190. Itzhak Gilboa et al., *Probability and Uncertainty in Economic Modeling*, 22 J. ECON. PERSP. 173, 186–87 (2008) (arguing that more general models may lead to more realistic results).

191. In fact, this is exactly what happened leading up to the financial crisis. In the face of true uncertainty, experts created financial models with simplistic assumptions. Miller & Rosenfeld, *supra* note 166, at 821–22. These models assigned a low probability to a declining housing market and many models failed to assign any probability to declining underwriting standards. See *id.* at 821–22 n.38; see also Uday Rajan et al., *The Failure of Models that Predict Failure: Distance, Incentives, and Defaults* 33–34 (Stephen M. Ross Sch. of Bus. at the Univ. of Mich., Research Paper No. 1122; Chi. Graduate Sch. of Bus., Research Paper No. 08-19, 2010), available at <http://ssrn.com/abstract=1296982> (concluding that bank’s declining underwriting standards undermined financial models). Banks deferred to the experts who created these models. See Miller & Rosenfeld, *supra* note 166, at 823. Regulators, in turn, deferred to the banks as rational actors when assigning capital requirements. See *id.* at 832.

192. See Miller & Rosenfeld, *supra* note 166, at 822 (listing several expert biases which may lead to assuming away realistic conditions); cf. Brian Dennis, *Should Ecologists Become Bayesians?*, 6 ECOLOGICAL APPLICATIONS 1095, 1099 (Nov. 1996) (stating that where true uncertainty exists policymakers should take responsibility for making a judgment rather than “pass off . . . beliefs disguised by fancy statistical analysis as science”).

193. See HUMAN-INDUCED CLIMATE CHANGE: AN INTERDISCIPLINARY ASSESSMENT 5–15, 59 (Michael E. Schlesinger et al. eds. 2007) (discussing various sorts of uncertainty in climate models); Richard B. Howarth & Patricia A. Monahan, *Economic, Ethics, and Climate Policy: Framing the Debate*, 11 GLOBAL & PLANETARY CHANGE 187, 189–90 (1996) (showing that CBA of climate disruption depends on “plausible yet arbitrary assumptions” which vary significantly among economists); Jonathan S. Masur & Eric A. Posner, *Climate Regulation and the Limits of Cost-Benefit Analysis*, 99 CALIF. L. REV. 1557, 1599 (2011) (finding climate disruption an unsuitable basis for agency action because of uncertainties about magnitudes of expected harm and its global nature). See generally Elisabeth J. Moyer et al., *Climate Impacts of Economic Growth as Drivers of Uncertainty in the Social Cost of Carbon* (RDCP Working Paper No. 13-02, 2013), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2312770](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2312770) (discussing uncertainties such as economic growth rates in climate modeling); Robert Pindyck, *Climate Change Policy: What do the Models Tell Us?*, 51 J. ECON. LIT. 860, 861–69 (2013) (explaining in detail why climate disruption’s complexity and other factors make



National security problems also exhibit sufficient complexity to defy reasonably reliable application of cost-benefit techniques to the estimation of physical outcomes.<sup>194</sup> For example, the Iraq invasion's costs depended in part on how Iraqis responded to the United States' presence. Sectarian violence, as it happens, greatly increased the invasion's cost to the United States and to the Iraqis.<sup>195</sup> Nobody could have accurately estimated the probabilities of such an outbreak and predicted the number of deaths sectarian violence would produce.

Intellectual property and telecommunications law have a similar dynamic defying CBA. An open internet architecture leaves space open for innovation.<sup>196</sup> But nobody can predict how much innovation such an architecture will stimulate or the dollar value of using a more closed architecture optimized for particular uses.<sup>197</sup> Accordingly, nobody can provide a CBA quantifying the costs and benefits of various architectural choices.<sup>198</sup> Similarly, we cannot know the optimal term of a copyright or patent.<sup>199</sup> For we cannot predict how much innovation the expiration of a term might facilitate by lowering the costs of access to works, or how much innovation the added incentive of a limited monopoly will generate for an initial innovator.<sup>200</sup>

I do not mean to claim that nobody ever predicts anything in areas of complexity. But the magnitude, probability, and timing of the most important consequences, which we must know in order to calculate an optimum, become impossible to specify in a complex system.<sup>201</sup> These consequences resisting quantification include catastrophes from climate

modeling of costs and benefits “close to useless” as policy tools); Martin L. Weitzman, *A Review of the Stern Review on the Economics of Climate Change*, 45 J. ECON. LIT. 703, 704 (2007) (pointing out that CBA fails to adequately account for small probabilities of very large consequences and depends heavily on discount rates chosen in the face of significant unresolved puzzles and ambiguities); KYSAR, *supra* note 176, at 73 (describing many environmental problems as characterized by complexity, uncertainty, nonlinearity, and feedbacks).

194. See DRIESEN, *supra* note 10, at 190–93 (explaining why we cannot calculate the costs and benefits of torture or of invading Iraq); see, e.g., Posner, *supra* note 160, at S36 (noting that the risk of “another major terrorist attack” cannot be assigned a “quantitative probability”).

195. See generally Daniel L. Byman, *Building the New Iraq: The Role of Intervening Forces*, 45 INT'L INST. FOR STRATEGIC STUD. 57, 58 (2003) (predicting that an invasion would unleash sectarian violence); CONRAD C. CRANE & W. ANDREW TERRILL, RECONSTRUCTING IRAQ: INSIGHTS, CHALLENGES, AND MISSIONS FOR MILITARY FORCES IN A POST-CONFLICT SCENARIO 2 (Strategic Stud. Inst., U.S. Army War Co. ed., 2003) (same).

196. See Lawrence B. Solum & Minn Chung, *The Layers Principle: Internet Architecture and the Law*, 79 NOTRE DAME L. REV. 815, 846–47 (2004) (noting the openness of the internet “commons” has “enabled the most powerful and diverse spur to innovation in modern times”).

197. See LAWRENCE LESSIG, THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD 88–89 (2001) (recommending “dumb” end-to-end design of the Internet because the Internet's creators could not predict what innovations it might spawn to calculate the costs and benefits of various architectural choices).

198. See Adam Candeub & Daniel McCartney, *Law and the Open Internet*, 64 FED. COMM. L.J. 493, 501 (2012) (characterizing economists' models quantifying the benefits from different types of internet infrastructure as “too immature” to guide policy makers).

199. See, e.g., Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyrights in Books, Pamphlets, and Computer Programs*, 84 HARV. L. REV. 281, 291–92 (1970) (purporting to carry out a CBA of copyright, but offering no quantitative estimates and therefore reaching a very “tentative” conclusion); see also DRIESEN, *supra* note 10, at 150–52 (analyzing Breyer's article cited above).

200. See Matthew J. Sag, *Beyond Abstraction: The Law and Economics of Copyright Scope and Doctrinal Efficiency*, 81 TUL. L. REV. 187, 202–04 (2006) (criticizing the Chicago School's CBA of copyright doctrine and pointing out that copyright's welfare effects are “extremely difficult” to assess).

201. Frank Ackerman, *Cost-Benefit Analysis of Climate Change: Where it Goes Wrong*, in ECONOMIC THOUGHT AND U.S. CLIMATE CHANGE POLICY 61, 63 (David M. Driesen ed., 2010) (characterizing climate models' results as “extremely sensitive to untestable . . . assumptions”).

disruption, the possibility of a crash leading to a financial depression, and how the innovation rates change when we alter the terms of intellectual property rights or change the internet's architecture—in short, matters of vital importance to economic growth on the one hand and possible calamity on the other.<sup>202</sup> Economists readily recognize that the models used to try to optimize complex systems often leave out or greatly underplay these crucial variables, which often make prediction subject to an enormous amount of uncertainty.<sup>203</sup> To the extent policymakers or lawyers treat probabilistic models of complex systems as reasonably reliable guides to regulatory decisions, they ignore the caveats of many responsible modelers.<sup>204</sup>

Furthermore, in a dynamic system any achievement of equilibrium would prove very short-lived, and hence, trivial.<sup>205</sup> For example, even if one somehow could spend the amount of money to ameliorate climate disruption that equals the value of the damages avoided in one time frame, one might encounter a “tipping point” that radically exacerbates climate impacts in the next time frame. Greenhouse gas emissions accumulate in the atmosphere and remain there for decades or even centuries, so that any amount of emissions in one time period increases the likelihood of crossing a critical threshold later on.<sup>206</sup> For dynamic phenomena, an optimal solution in one time frame will rarely prove optimal in another.<sup>207</sup>

Although law and economics tend to treat efficiency as static, economists themselves sometimes employ dynamic models.<sup>208</sup> Experts in antitrust, intellectual property scholars, and students of market-based environmental measures often employ the concept of dynamic efficiency—which economics does not define consistently—to try to take into account innovation's importance.<sup>209</sup> Although one can sometimes retrospectively model

202. See, e.g., Martin L. Weitzman, *On Modeling and Interpreting the Economics of Catastrophic Climate Change*, 91 REV. ECON. & STAT. 1 (2009) (explaining that the unknown probabilities of catastrophic climate disruption renders conventional CBA rather useless).

203. See *id.* at 2 (suggesting that conventional modeling does not account for the “fat tail” risks from climate disruption); Ackerman, *supra* note 201, at 72–74 (discussing uncertainties in climate disruption modeling generally, and the treatment of potential catastrophe in various models).

204. See, e.g., WILLIAM D. NORDHAUS & JOSEPH BOYER, *WARMING THE WORLD: ECONOMIC MODELS OF GLOBAL WARMING* 71, 98 (2000) (describing their model's damage function as extremely conjectural). See generally ORRIN H. PILKEY, & LINDA PILKEY-JARVIS, *USELESS ARITHMETIC: WHY ENVIRONMENTAL SCIENTISTS CANNOT PREDICT THE FUTURE* (2007) (discussing the flaws in models used by policy makers in forming environmental policies); Wendy Wagner et al., *Misunderstanding Models in Environmental and Public Health Regulation*, 18 N.Y.U. ENVTL. L.J. 293, 318 (2010) (explaining that models illuminate dynamics and uncertainties rather than generate answers).

205. See David M. Driesen, *The Economic Dynamics of Environmental Law: Cost-Benefit Analysis, Emissions Trading, and Priority-Setting*, 31 B.C. ENVTL. AFF. L. REV. 501, 508 (2004) (noting that equilibriums “come and go” quickly as the economy and technical states change).

206. See HOWARD A. LATIN, *CLIMATE CHANGE POLICY FAILURES: WHY CONVENTIONAL MITIGATION APPROACHES CANNOT SUCCEED* 160 (2012) (noting the urgency that comes from “‘tipping points’ and the persistence of greenhouse gases”).

207. See JESUS H. DE SOTO, *THE THEORY OF DYNAMIC EFFICIENCY* 29 (2009) (stating that “many behaviors” which may be inefficient in the short-run may prove efficient in the long-run).

208. See Richard J. Gilbert & Steven C. Sunshine, *Incorporating Dynamic Efficiency Concerns in Merger Analysis: The Use of Innovation Markets*, 63 ANTITRUST L.J. 569, 575–76 (1995) (citing studies employing dynamic efficiency models).

209. See DE SOTO, *supra* note 207, at 8 (defining dynamic efficiency as entrepreneurial capacity); Andrew B. Abel et al., *Assessing Dynamic Efficiency: Theory and Evidence*, 56 REV. ECON. STUD. 1, 2 (1989) (defining

dynamic efficiency,<sup>210</sup> doing so prospectively for a new set of rules proves very problematic.<sup>211</sup> Furthermore, dynamic and static efficiency frequently conflict making any general efficiency claim incoherent.<sup>212</sup>

Saying that government cannot calculate what legal rules will prove efficient in many contexts because of complexity does not imply that analysis is useless. Experts can give us important information to guide policy decisions. For example, a scientific consensus teaches us that greenhouse gases cause climate disruption and will produce serious problems in the future, even though science cannot tell us the precise magnitude, timing, and location of climate disruption's significant effects.<sup>213</sup> Similarly, several economists

an economy as dynamically efficient if it invests less than it earns in profit); Alice H. Amsden & Ajit Singh, *The Optimal Degree of Competition and Dynamic Efficiency in Japan and Korea*, 38 EUR. ECON. REV. 941, 949 (1994) (defining dynamic efficiency as that which induces investment); Gordon Anderson, *An Empirical Note on Assessing Dynamic Efficiency: Integration, Co-Integration, and the Long Run*, 4 STRUCTURAL CHANGE & ECON. DYNAMICS 345, 345 (1993) (defining dynamic efficiency as requiring that the marginal productivity of capital exceed the population growth rate); Jith Jayaratne & Philip E. Strahan, *Entry Restrictions, Industry Evolution, and Dynamic Efficiency*, 41 J.L. & ECON. 239, 271 (1998) (defining dynamic efficiency in terms of long term net social benefits); Christopher S. Yoo, *Beyond Network Neutrality*, 19 HARV. J.L. & TECH. 1, 19 (2005) (defining dynamic efficiency as a shifting out of the production possibility frontier); see, e.g., Thomas O. Barnett, *Interoperability Between Antitrust and Intellectual Property*, 14 GEO. MASON L. REV. 839, 864–66 (2007) (arguing that a rule requiring iTunes to operate with non-Apple devices would be dynamically inefficient because it would discourage innovation); Ian Hastings, *Dynamic Innovative Inefficiency in Pharmaceutical Patent Settlements*, 13 N.C. J.L. & TECH. 31, 51–57 (2011) (arguing that a law encouraging generic drug makers to compete with brand name drugs to reduce monopoly prices is dynamically inefficient because it would discourage innovation by the makers of brand name drugs); Yoo, *supra*, at 48, 65 (comparing the dynamic efficiency of network neutrality for the Internet with that of network diversity).

210. See, e.g., Abel et al., *supra* note 209, at 14 (finding the U.S. economy dynamically efficient between 1929 and 1984); Amsden & Singh, *supra* note 209, at 949 (finding Japan's economy from 1950–73 to be dynamically efficient); Neda Salehirad & Taraneh Sowlati, *Dynamic Efficiency Analysis of Primary Wood Producers in British Columbia*, 45 MATHEMATICAL & COMPUTER MODELING 1179, 1186 (2007) (providing a retrospective dynamic efficiency analysis of the wood industry in British Columbia).

211. See DE SOTO, *supra* note 207, at 35, 40 (describing the calculation of future costs and benefits as a futile exercise thereby rendering CBA “not viable”); OECD, DYNAMIC EFFICIENCIES IN MERGER ANALYSIS 10 (2007), available at <http://www.oecd.org/daf/competition/mergers/40623561.pdf> (finding quantification of dynamic efficiency “impossible” because of uncertainty in innovation's timing, cost, and commercial success, difficulties in measuring innovation, informational asymmetries, and difficulties in translating innovation into welfare metrics); Daniel A. Crane, *Optimizing Private Antitrust Enforcement*, 63 VAND. L. REV. 675, 689 (2010) (describing quantification of dynamic efficiency as “little more than guesswork”); Yoo, *supra* note 209, at 10 (arguing that we cannot make an *a priori* determination of whether short-term static losses from network diversity outweigh long-run dynamic efficiency); Steven Nadel & Andrew deLaski, *Appliance Standards: Comparing Predicted and Observed Prices* vi (July 2013), <http://www.aceee.org/research-report/e13d> (“modeling innovation is very difficult”); see, e.g., Abel et al., *supra* note 209, at 14 (assuming that since the United States was dynamically efficient in the past it will be in the future); Anderson, *supra* note 209, at 351 (rejecting Abel's conclusion and finding little evidence that the U.S. is dynamically efficient).

212. See Lewis A. Kornhauser, *A Guide to the Perplexed: Claims of Efficiency in Law*, 8 HOFSTRA L. REV. 591, 619–20 (1980) (finding a conflict between static and dynamic efficiency because maximization of wealth in the short-term may not coincide with adequate “investment in research and development”).

213. See IPCC, FIRST ASSESSMENT REPORT: CLIMATE CHANGE, THE IPCC SCIENTIFIC ASSESSMENT xii (1990) (stating that there are many “uncertainties” in predicting climate change with regard to “timing, magnitude, and regional patterns”); IPCC, FOURTH ASSESSMENT REPORT: CLIMATE CHANGE 2007: IMPACTS, ADAPTATIONS, AND VULNERABILITY 419 (2009) (warning the public to expect catastrophic climate events).

and academic lawyers predicted the financial crisis.<sup>214</sup> They too could not predict its magnitude or timing, but they did suggest it would occur (including, in the cases of Nouriel Roubini and Arthur Wilmarth, many details about what sorts of failures to expect).<sup>215</sup> Experts on Iraq could not predict the war's cost, but they emphasized a serious risk of sectarian and anti-U.S. violence and accurately predicted specific consequences from such an outbreak.<sup>216</sup> They also recommended specific steps to minimize the consequences that they accurately predicted.<sup>217</sup> In short, analysts often know a lot about the shape of change over time. Experts examining dynamic systems can often predict negative outcomes that we would want to avoid, at least qualitatively, and suggest steps to ameliorate or avoid negative outcomes. They cannot, however, quantitatively predict the magnitude and likelihood of predicted effects. Accordingly, their analysis becomes useless if we insist on viewing government as an optimizer because expert analysis accurately predicting trends in complex areas tends to be qualitative and therefore of little use in a cost-benefit framework. But such qualitative analysis can be quite useful if we have a more realistic and limited view of government's role, as we shall see.

In short, complexity makes optimality unachievable in practice for governments and trivial in principle. Adopting an efficiency goal in complex contexts provides a framework ill-suited to effective use of the type of information that knowledgeable experts can generate in spite of uncertainty.

Accordingly, Posner's suggestion that restructuring economic regulation should wait until we have sufficient information to calculate regulation's costs and benefits amounts to a call for indefinite postponement. This day will never come. We might identify a package of reforms that would help us avoid another economic collapse. But we can never guess the magnitude and probability of the collapse avoided or properly predict the dollar value of the reform's costs.<sup>218</sup> Reliance on an economic efficiency model predicated on CBA works well as a justification for never figuring out how to properly regulate financial

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214. See NATIONAL COMMISSION, *supra* note 56, at 17–19; see, e.g., Dean Baker, *The Menace of an Unchecked Bubble*, 3 THE ECONOMIST'S VOICE (2006) (noting the build-up of a housing bubble and predicting the housing sector's collapse with big consequences for the economy); Stout, *supra* note 136, at 709 (identifying derivatives as posing risks threatening the entire economy); Wilmarth, *supra* note 125, at 332–407 (describing the risks that created the financial crisis before it occurred in great detail and presciently discussing their potential consequences); Stephen Mihm, *Dr. Doom*, N.Y. TIMES (Aug. 17, 2008), [http://www.nytimes.com/2008/08/17/magazine/17pessimist-t.html?pagewanted=print&\\_r=0](http://www.nytimes.com/2008/08/17/magazine/17pessimist-t.html?pagewanted=print&_r=0) (describing Nouriel Roubini's prediction of the pending financial crisis).

215. See generally Wilmarth, *supra* note 125 (discussing the shift of large firms' borrowing from banks to capital markets, the decline of bank profit margins, and the creation of a two-tiered banking industry, among other things).

216. See Byman, *supra* note 195, at 58 (describing the possibility of Iraqi soldiers turning to banditry and the possible negative effects of the sudden release of several hundred thousands of young men into society); see also CRANE & TERRILL, *supra* note 195, at 1 (explaining American experiences with poor post-conflict planning and additional complications related to the cultural differences within Iraq).

217. See THOMAS E. RICKS, *FIASCO: THE AMERICAN MILITARY ADVENTURE IN IRAQ 102–04* (2006) (noting experts in the State and Defense departments were fired for not supporting the postwar policy).

218. See Hilary J. Allen, *A New Philosophy for Financial Stability Regulation*, 45 LOY. U. CHI. L.J. 173, 186–91 (2013) (noting that while compliance costs are susceptible to empirical analysis, the benefits of financial regulations are far more elusive).

markets and other complex systems.<sup>219</sup> But if our goal involves rational regulation of systemic risk, it is useless.<sup>220</sup> And the CBA-substitute used in many areas of financial regulation, the neoclassical assumptions of rationality (traditionally defined) and perfect information, dangerously misrepresent the complex dynamic world we live in. Indeed, they assume away the problem of bubbles leading to crashes, the problem at the very heart of any serious treatment of systemic risk.

### III. INSTITUTIONAL FACTORS MAKING EFFICIENCY AN ELUSIVE GOAL FOR GOVERNMENTS

Although neoclassical law and economics treat law as if it were a mere transaction, laws governing complex systems are not transactions. Enactment and reform of laws create rules, which usually remain in place for a long time. As such, they provide a framework. And market actors can carry out a variety of transactions, many of them unpredictable, under the framework that law provides.

A good example of this comes from the rule the Securities and Exchange Commission (SEC) recently promulgated to allow shareholders access to the proxy voting processes that corporations use to elect directors.<sup>221</sup> This rule, however, does not give the government control over who gets to run, let alone who gets elected. And nobody can predict in advance what decisions shareholders or managers will make with or without proxy access.<sup>222</sup> Nor can anybody predict how much value a corporation would gain or lose under one or another director.<sup>223</sup> The SEC cannot monetize the costs and benefits of proxy rules to predict whether any particular proxy regime will prove efficient or not, because the government influences but does not control shareholders and managers' choice of transactions.<sup>224</sup> That financial regulation usually has a very unpredictable and indirect influence on actual transactions allocating resources makes reliable CBA impossible for financial regulation generally, not just in the proxy context.<sup>225</sup>

219. See generally Mario J. Rizzo, *The Mirage of Efficiency*, 8 HOFSTRA L. REV. 641, 641–42 (1980) (arguing that once one takes third-party or spillover effects into account, information requirements needed to predict efficient outcomes become overwhelming).

220. See Allen, *supra* note 218, at 190–91 (explaining that regulators under a CBA framework emphasize immediate compliance costs and give short shrift to the avoidance of systematic risk).

221. See *Business Roundtable v. SEC*, 647 F.3d 1144, 1147 (D.C. Cir. 2011) (describing the SEC proposal to provide for inclusion of shareholder nominated directors on proxy ballots).

222. See Grant M. Hayden & Matthew T. Bodie, *The Bizarre Law and Economics of Business Roundtable v. SEC*, 38 J. CORP. L. 101, 124–25 (2012) (stating that, at best, predictions of the effects of proxy access rules will be “mixed”).

223. See *id.*; cf. Kraus & Raso, *supra* note 144, at 308–09 (discussing an economic literature on whether boards containing dissidents or potentially challenged by dissidents performed better).

224. See *Business Roundtable*, 647 F.3d at 1148 (noting that the SEC recognized that proxy contests offer “potential benefits of improved . . . company performance”). The *Business Roundtable* court found the SEC’s “potential benefits” finding arbitrary and capricious, because of mixed empirical evidence on the question of whether shareholder-chosen directors improve financial performance. See *id.* at 1150–51. Under normal principles of administrative law, courts allow agencies to make judgments when evidence is mixed and defer to those judgments. See Anthony W. Mongone, Note, *Business Roundtable: A New Level of Judicial Scrutiny and its Implications in a Post-Dodd-Frank World*, 2012 COLUM. BUS. L. REV. 746, 793 (2012) (concluding that the court wrongly substituted its view for that of the agency).

225. See Jonathan C. Coates, *Cost-Benefit Analysis of Financial Regulation: Case Studies and Implications*, 124 YALE L.J. 882, 887 (2014) (concluding that CBA constitutes “guesstimation”); Charles K. Whitehead, *The Goldilocks Approach: Financial Risk and Staged Regulation*, 97 CORNELL L. REV. 1267, 1274–75 (2012)

Antitrust law provides another example of how law typically provides a legal framework that does not control market actors' choices and therefore operates unpredictably with respect to efficiency. The antitrust approach that prevailed until the 1970s tended to restrict mergers.<sup>226</sup> But this law did not determine what innovations the relatively small companies this approach encouraged might pursue or how they would operate. Surely these companies would strive to please customers who would buy their goods only if the quality and price met their needs. So, the market would tend to pursue efficiency under this framework. When the antitrust law, in keeping with Posner and Bork's teachings, became more welcoming of oligopoly, this welcome mat did not determine how many companies would choose to merge or whether the mergers were wise.<sup>227</sup> Companies would make their own choices about mergers. And after they make these decisions, the companies make their own decisions about how to allocate resources—how and whether to innovate, how to make their products, and how to manage their workforce, thereby

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(pointing out that it can be difficult for regulators to observe private transactions that would have an influence on regulation's efficacy); Jonathan D. Guynn, Note, *The Political Economy of Financial Rulemaking After Business Roundtable*, 99 VA. L. REV. 641, 673–78 (2013) (describing alleged shortcomings in CBA of financial regulations); see, e.g., *American Equity Inv. Life Ins. Co. v. SEC*, 613 F.3d 166, 167 (D.C. Cir. 2009) (adjudicating the validity of a rule subjecting fixed index annuities to “the full panoply of requirements” set forth in the Securities Act of 1933); *Chamber of Commerce v. SEC*, 443 F.2d 890, 890, 896, 904 (D.C. Cir. 2005) (reviewing a rule requiring that a mutual fund board contain 75% independent directors and an independent chairman and not faulting the agency for unquantified benefits); *Inv. Co. Inst. v. U.S. Commodity Futures Trading Comm'n*, 891 F. Supp. 2d 162, 193 (D.D.C. 2013) (explaining that the benefits of registering companies engaged in derivatives trading “cannot be meaningfully quantified” because the “total benefit of risk mitigation” that might come from having adequate information is unknown); Kraus & Raso, *supra* note 144, at 332 (arguing that Dodd–Frank addresses absolute uncertainty rather than probabilities, and therefore CBA is not appropriate); Elizabeth Pollman, *Information Issues on Wall Street 2.0*, 161 U. PA. L. REV. 179, 230–31 (2012) (finding claims that insider trading produces benefits as plausible as claims that it produces costs); Morgan Ricks, *A Regulatory Design for Monetary Stability*, 75 VAND. L. REV. 1289, 1294, 1328 (2012) (characterizing calculation of systemic risk as “far beyond our . . . powers”); cf. Arthur Frass & Randall Lutter, *On the Economic Analysis of Regulations at Independent Regulatory Commissions*, 63 ADMIN. L. REV. 213, 234 (2011) (recognizing that “the evaluation of low-probability, high-consequence events poses a significant challenge” to CBA, but claiming that a “formal economic analysis” can help identify alternatives and evaluate their cost effectiveness). Eric Posner and E. Glen Weyl have made a start at permitting CBA of individual financial products. Eric A. Posner & E. Glen Weyl, *Benefit-Cost Analysis for Financial Regulation*, 103 AM. ECON. REV. 393, 393 (2013). Their approach does not overcome the problems I have identified in this discussion generally. They do not have a method to predict the likelihood of a particular financial product causing a crisis. See *id.* at 394 (conceding that agencies will have to estimate “the magnitude of risk reduction” associated with various options). They estimate the value of a crisis as between one percent and 20% of GDP, a range wide enough to permit a broad spectrum of results in a number of cases. *Id.* They also assume, contrary to recent experience, an efficient market in asset production and a linear supply. *Id.* at 395; cf. Eric A. Posner & E. Glen Weyl, *Benefit-Cost Paradigms in Financial Regulation* 10 (University of Chicago, Coase-Sandor Institute for Law and Economics Working Paper No. 660, 2014), available at [http://papers.ssm.com/sol3/papers.cfm?abstract\\_id=2346466](http://papers.ssm.com/sol3/papers.cfm?abstract_id=2346466) (assuming that demand for CBA from financial regulators will lead to the creation of adequate empirical methods); Hester Peirce, *Economic Analysis by Federal Financial Regulators*, 9 J. L. ECON. & POL'Y 569, 612 (2013) (characterizing CBA as “practical” for financial regulation without a word of justification for that conclusion).

226. See Jesse W. Markham, Jr., *Lessons for Competition Law from the Economic Crisis: The Prospect for Antitrust Responses for the “Too-Big-To-Fail” Phenomenon*, 16 FORDHAM J. CORP. & FIN. L. 261, 278–80 (2011) (stating the 1970s ushered in a new era of economic thought that viewed trust-busting as “costly” and “error prone”); Robert Pitofsky, *The Political Content of Antitrust*, 127 U. PA. L. REV. 1051, 1058–59 (1979) (indicating that a driving force behind the pre-1970s antitrust laws was preserving competition).

227. See F.M. SCHERER, *INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE* 131–32 (1970) (confessing that economists could not predict market actors' choices as laws tended to permit oligopolies).

pursuing efficiency within a more permissive antitrust framework. Hence, government choices do not determine the transactions private parties would carry out.

These examples reveal a hidden truth about regulation: Regulatory decisions rarely *control* resource allocation. Yet, the entire rationale for treating regulatory decisions as microeconomic transaction-analogues rests on viewing them as resource allocating.<sup>228</sup> To be sure, rules can often *influence* resource allocation.<sup>229</sup> But the transactions that market actors freely choose within a legal framework usually *determine* efficient outcomes, not the rules establishing the framework under which these choices take place. Therefore, one cannot reliably say what legal rules will prove efficient.

The major exception to this rule that regulations do not allocate resources comes from a declining form of regulation: price controls for regulated industries. In many cases, the government did control resource allocation in these regimes, for example, by choosing what sorts of investments utilities could make with the support of government bonding or compensation through public utility commission rate-setting.<sup>230</sup>

Furthermore, in non-regulatory spheres, government decisions sometimes do control resource allocation. Government procurement, for example, controls resource allocation and an efficiency ideal should inform such decisions; knowledgeable government purchasers should be able to gather enough information to make efficient procurement decisions in most cases. When government becomes a market actor, the efficiency norms economists have developed to model markets become an appropriate and reasonably tractable guide to government action.

Similarly, taxing and spending allocates resources and one can analyze tax efficiency.<sup>231</sup> Still, analysis of taxing and spending often takes the form of macroeconomic analysis.<sup>232</sup> Indeed, in the wake of the financial crisis many analysts evaluated fiscal decisions in terms of their capacity to provide economic opportunities leading to growth, not in terms of their efficiency.<sup>233</sup>

But regulatory decisions rarely determine resource allocation. And hence, especially in complex contexts, demanding that the government refrain from acting until it knows whether its actions are efficient or not often constitutes an impossible demand. Indeed, a

228. See Baker, *supra* note 17, at 4–5 (indicating Posner’s view that determining whether a law is efficient or inefficient depends upon the law’s distributive properties).

229. For instance, when there are high transaction costs the choice to impose a property rule, as opposed to a liability rule, will influence resource allocation. See James E. Krier & Stewart J. Schwab, *Property Rules and Liability Rules: The Cathedral in Another Light*, 70 N.Y.U. L. REV. 440, 451 (1995) (describing the effects of a judge’s assignment of entitlement when private bargaining is likely to fail).

230. See Richard J. Pierce, Jr., *The Regulatory Treatment of Mistakes in Retrospect: Canceled Plants and Excess Capacity*, 132 U. PA. L. REV. 497, 508–14 (1984) (stating that some state utility commissions must grant approval before a utility can construct a new nuclear plant and suggesting that many have authority to decide whether to reimburse a utility for its costs through a rate increase).

231. See Yair Listokin, *Equity, Efficiency, and Stability: The Importance of Macroeconomics for Evaluating Income Tax Policy*, 29 YALE J. ON REG. 45, 48–49, 58 (2012) (arguing that a “widespread consensus” for examining tax policy from a microeconomic perspective led to a tax code which, in many instances, tends to destabilize the economy); cf. Alex Raskolnikov, *Accepting the Limits of Tax Law and Economics*, 98 CORNELL L. REV. 523, 534–36 (2013) (characterizing taxation as a transfer payment analogous to theft and arguing that this prevents using conventional law and economics to arrive at an optimum).

232. See, e.g., Listokin, *supra* note 231, at 59 (stating that macroeconomic considerations led to tax cuts in 2001 and in 2003).

233. See *id.* at 47–48 (stating that the Great Recession motivated the government to take stabilizing action in 2008, 2009, and 2010).

major rationale for capitalism involves government's inability to amass sufficient information to make efficient resource allocation decisions.<sup>234</sup> We rely on markets precisely because government cannot determine whether its actions are efficient, except in very narrowly defined contexts. Insisting that governments regulate efficiently, therefore, often constitutes an impossible and therefore frequently inappropriate demand.

Indeed, the Coase theorem shows that absent transaction costs, legal rule choices are wholly irrelevant to economic efficiency.<sup>235</sup> For in such a world, Coase tells us private parties would make deals to create efficient outcomes no matter what legal rule we impose.<sup>236</sup> Ironically, a demonstration of efficiency's irrelevance to law helped create the field of law and microeconomics.

Of course, we live in a world that has positive transaction costs.<sup>237</sup> As a result, legal rules influence resource allocation.<sup>238</sup> But unless we can predict what private bargains will arise under a given legal framework, we cannot predict whether those outcomes will prove efficient. And we usually cannot predict private bargains well for complex systems.<sup>239</sup>

Law's inability to dictate resource allocation to ensure efficient outcomes becomes even clearer in *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral* and the vast body of work to which it gave rise.<sup>240</sup> In the *Cathedral* article,

234. See F.A. HAYEK, III LAW, LEGISLATION, AND LIBERTY: A NEW STATEMENT OF THE LIBERAL PRINCIPLES OF JUSTICE AND POLITICAL ECONOMY, RULES AND ORDER 66–72 (1973) (explaining in detail why competitive markets make use of information to approximate efficient outcomes in a way that a government cannot); Frederick A. Hayek, *The Use of Knowledge in Society*, 4 AM. ECON. REV. 519, 519–529 (1945); (explaining that the government does not possess the knowledge needed to optimal resource allocation, because that knowledge is dispersed throughout society); Richard A. Posner, *Hayek, Law, and Cognition*, 1 N.Y.U. J.L. & LIBERTY 147, 159 (2005) (describing the ability to collect the knowledge of millions of economically active persons as a major advantage of the price system).

235. See Richard A. Epstein, *The Clear View of The Cathedral: The Dominance of Property Rules*, 106 YALE L.J. 2091, 2092 (1997) (pointing out that without transaction costs the choice between property and liability rules would have no influence on outcomes in keeping with the Coase theorem). See generally Guido Calabresi, *Transaction Costs, Resource Allocation and Liability Rules—A Comment*, 11 J.L. & ECON. 67 (1968) (accepting that the Coase theorem would hold true in the long as well as short run); R. H. Coase, *The Problem of Social Costs*, 3 J.L. & ECON. 1 (1960) (arguing that problems of pollution are reciprocal and that in a world without transaction costs polluters and pollution victims would always bargain to achieve optimal resource allocation).

236. See Coase, *supra* note 235, at 5–8 (illustrating why bargaining to efficient results would occur with an example of cattle interfering with crop raising).

237. Epstein, *supra* note 235, at 2092 (stating that we live in a world of “positive and large” transaction costs).

238. See Krier & Schwab, *supra* note 229, at 451 (describing the effects of a judge's assignment of entitlement when private bargaining is likely to fail).

239. See John Mixon & Kathleen McGlynn, *A New Zoning and Planning Metaphor: Chaos and Complexity Theory*, 42 HOUS. L. REV. 1221, 1225 n.17 (2006) (drawing the conclusion that it is “both practically and theoretically impossible to predict the long-run state of a complex system”).

240. See Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972); Ian Ayres & Paul M. Goldbart, *Optimal Delegation and Decoupling in the Design of Liability Rules*, 100 MICH. L. REV. 1 (2001); Richard Craswell, *Property Rules and Liability Rules in Unconscionability and Related Doctrines*, 60 U. CHI. L. REV. 1 (1993); Robert C. Ellickson, *Alternatives to Zoning: Covenants, Nuisance Rules, and Fines as Land Use Controls*, 40 U. CHI. L. REV. 681 (1973); Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules in Economic Analysis*, 109 HARV. L. REV. 713, 732–37 (1996); Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Organizations*, 84 CALIF. L. REV. 1293 (1996); A. Mitchell Polinsky, *Resolving Normal Nuisance Disputes: The Simple Economics of Injunctive and Damage Remedies*, 32 STAN. L. REV. 1075 (1980);



Guido Calabresi and Douglas Melamed unified tort and property theory by discussing the choice between protecting rights with property rules (i.e. with injunctions) and protecting them with liability rules (payment of damages).<sup>241</sup> This framework, while developed in the context of nuisance law, provides a broad metaphor for a wide variety of areas of law.<sup>242</sup> The *Cathedral* article and the vast literature that followed in its wake recognize that judges often cannot allocate resources efficiently, because they lack sufficient information.<sup>243</sup> Hence, the literature growing up in the shadow of the *Cathedral*<sup>244</sup> tended to imagine that a judge issues an order that does not itself produce an efficient outcome and asks whether a property or liability rule would best support private bargaining to reach an efficient solution by rearranging the judge's allocation of rights.<sup>245</sup> This way of understanding the problem at least implicitly recognizes that private parties can compensate for inefficient decisions even when the legal decision only influences two parties.<sup>246</sup> It thus recognizes that legal decision-makers, even in an individual case not characterized by the complexity of the systems this Article focuses on, often cannot get enough information to make efficient choices but instead provide a framework against which parties can seek efficient bargains.<sup>247</sup>

Many scholars writing in the *Cathedral*'s shadow claim that they can predict which rules lead to efficient outcomes, not because they imagine judges have enough information to create efficient rules, but because they believe that scholars can predict which rules will lead to private bargaining or adjustment of entitlements to produce an efficient outcome.<sup>248</sup>

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Symposium, *Property Rules, Liability Rules, and Inalienability: A Twenty-Five Year Retrospective*, 106 YALE L.J. 2081 (1997).

241. Calabresi & Melamed, *supra* note 240, at 1089, 1116 (describing a framework of “property, liability, or alienability rules” as unifying property and torts and making it clear that a property rule implies a right protected by injunction whereas a liability rule only protects by creating a right to damages).

242. *See id.* at 1124–27 (suggesting that it applies to many areas of law and applying it to laws prohibiting theft and rape).

243. *See id.* at 1096, 1119 (assuming an absence of certainty as to whether a benefit is worth its costs to society); Krier & Schwab, *supra* note 229, at 453–55 (in light of high transaction costs and high damage assessment costs there is “no *a priori* basis” for favoring liability rules over property rules).

244. *See* Carol Rose, *The Shadow of The Cathedral*, 106 YALE L.J. 2175, 2176 (1997) (coining this metaphor but using it to refer to the examples motivating analysis of property and liability rules).

245. *See, e.g.*, Krier & Schwab, *supra* note 229, at 448–49 (discussing trading of entitlements after judgment); Craswell, *supra* note 240, at 21–22 (finding the literature on optimal default rules inconclusive because of informational difficulties).

246. *Cf.* Ward Farnsworth, *Do Parties to Nuisance Cases Bargain After Judgment? A Glimpse Inside the Cathedral*, 66 U. CHI. L. REV. 373, 384 (1999) (showing that litigants in a sample of simple nuisance cases do not bargain after judgment to produce efficient outcomes); Gideon Parchomovsky & Peter Siegelman, *Selling Mayberry: Communities and Individuals in Law and Economics*, 92 CALIF. L. REV. 75, 82 (2004) (suggesting that nuisance law may not influence outcomes even when relevant).

247. *See* Ayres & Goldblart, *supra* note 240, at 19 (noting that “judicial selection of an initial entitlement holder does not determine allocative efficiency”); Craswell, *supra* note 240, at 21–26 (discussing how courts rarely possess sufficient information to dictate efficient results in contract cases); Epstein, *supra* note 235, at 2093 (favoring property rules because judges cannot determine the correct level of damages to efficiently compensate the loser of a property right); Polinsky, *supra* note 240, at 1080 (stating that under realistic assumptions about imperfect information one cannot determine whether a property or liability rule is superior).

248. *See, e.g.*, Ayres & Goldbart, *supra* note 240, at 8 (proposing assigning liability to the party who is the most efficient chooser of whether to pay or give up a right); Epstein, *supra* note 235, at 2093–94 (arguing that private bargaining should work fine absent a monopoly position leading to a holdout problem and therefore commending reliance on property rules in most situations); *cf.* Kaplow & Shavell, *supra* note 240, at 720 (stating

But their beliefs about which rules lead to efficient outcomes often diverge rather sharply.<sup>249</sup> Furthermore, even in the simple contexts central to the *Cathedral* literature (relative to the cases this Article focuses on), many scholars recognize that judges will have trouble getting enough information to predict which rule will lead to efficient private bargains after judgment.<sup>250</sup> In more complex contexts, they recognize that the informational burdens limiting efficient outcomes become extremely formidable.<sup>251</sup> In particular, they recognize that bargaining, which this literature usually treats as the means of reaching efficient outcomes, often becomes impossible in such contexts.<sup>252</sup>

In saying that complexity and institutional considerations defeat efforts to achieve efficiency in practice, I mean only to say that they defeat efforts to achieve allocative efficiency. Law and economics scholars sometimes can identify the most cost effective means of achieving a regulatory goal.<sup>253</sup> In other words, even when law and economics cannot identify optimal goals for law, it can determine the cheapest way of meeting any particular legal goal.

Furthermore, lawyers can sometimes show that a particular measure achieves nothing and therefore cannot be efficient because it imposes costs with no benefits.<sup>254</sup> These cases, however, are rare. The run-up to the financial crisis shows that a lot of people argued for destructive deregulation by claiming that under standard neoclassical assumptions, the regulation delivered no benefits.<sup>255</sup> That kind of argument is incorrect and dangerous, since neoclassical assumptions, while sometimes useful for scholars, can prove very misleading in describing market actors' behavior. In rare cases, however, empirical studies of causal

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that when bargaining is possible but not always successful because of misunderstandings it is impossible to determine whether liability or property rules are best).

249. See Rose, *supra* note 244, at 2189 (noting a disagreement between Kaplow and Shavell on the one hand and Ayres and Talley with respect to the efficiency of competing rules applicable to externality problems); see also Merges, *supra* note 240, at 1304 (characterizing his conclusions as "counter to much of the contemporary scholarly work in the contemporary entitlements literature"); cf. Epstein, *supra* note 235, at 2092–94 (strongly favoring property rules absent a holdout problem as efficient); Kaplow & Shavell, *supra* note 240, at 719 (disagreeing with prior commentators' conclusion that liability rules are inferior to property rules when damages are uncertain).

250. See James E. Krier & Stewart J. Schwab, *The Cathedral at Twenty-Five: Citations and Impressions*, 106 YALE L.J. 2121, 2135 (1997) (arguing that the choice of liability over property rules should hinge on a comparison between judicial assessment costs associated with assigning liability and the costs of private bargaining under a property rule, but determining which is higher is very difficult in the context of litigation); Kaplow & Shavell, *supra* note 240, at 732–37 (finding that when externalities are present but private bargaining is possible, the choice between property and liability rules is a wash).

251. See Ayres & Goldbart, *supra* note 240, at 64–66 (commending a weighing of numerosity and informational advantages pointing in opposite directions in choosing liability rules and conceding that in some contexts adding one additional party makes it very hard for a court to implement an efficient liability regime); Merges, *supra* note 240, at 1306 (noting the difficulty of establishing an efficient liability rule for intellectual property because of valuation problems).

252. See Kaplow & Shavell, *supra* note 240, at 749 (explaining that there are a lot of pollution victims so coordination among them is difficult); cf. Merges, *supra* note 240, at 1302–04 (noting that collective private associations sometimes provide proxies for private bargaining where transaction costs make individual bargains prohibitively expensive in the intellectual property context).

253. See Driesen, *supra* note 180, at 15–16 (indicating the cost-effective principle tends to favor environmental benefit trading as the least costly measure for achieving abatement targets).

254. See, e.g., Breyer, *supra* note 199, at 323–39 (showing that a very long copyright term creates no benefits).

255. See, e.g., Shughart, *supra* note 95, at 612 (arguing for Glass–Steagall's repeal because it imposed costs with "no apparent benefits for depositors").

relationships can show that a particular proposal delivers no benefits but imposes costs.<sup>256</sup> In such cases, however, one does not need either a CBA or an efficiency framework to show that the proposal merits rejection. Nor do I necessarily mean to deny that we have made some progress in the literature growing up in the shadow of the *Cathedral* in evaluating the relative theoretical efficiency of different forms of rules.<sup>257</sup> But in complex contexts, those choices often amount to choices among two rules that are likely to be far off the mark with respect to efficiency. Complexity makes the calculation of costs and benefits of both property and liability rules deeply problematic, while usually ruling out the kind of bargaining that might lead to efficient results in a simpler context.<sup>258</sup>

#### IV. TOWARD LAW AND MACROECONOMICS

Since laws create frameworks influencing resource allocation in complex ways, they operate like macroeconomic decisions (e.g. monetary policy), which likewise influence but do not control resource allocation. They also resemble macroeconomic policy in the sense of having only indirect and difficult to calculate impacts on markets even in contexts where they only influence *part* of the economy, rather than the whole.<sup>259</sup> Hence, a macroeconomic legal theory might work better than the microeconomic approach, especially in complex contexts.<sup>260</sup>

I wrote a book—*The Economic Dynamic Analysis of Law*—developing a specific macroeconomic approach to law, which I call an economic dynamic approach.<sup>261</sup> I confine myself here to a brief sketch of the main ideas leaving further defense of this approach to the book. But since one cannot optimize the regulation of a dynamic system that makes frequent changes anyway, and even if one could, the achievement would prove temporary and therefore trivial, we need to create a law and economics that works for law, not just markets. My main goal here involves suggesting that a plausible alternative to law and microeconomics exists.

A good macroeconomic approach must make appropriate use of the information that experts provide by focusing on the shape of change over time. Legal change frequently counteracts negative economic dynamics.<sup>262</sup> So, we need to analyze what direction we are

256. See Breyer, *supra* note 199, at 323–39 (discussing empirical information about the incentives of copyright terms extending beyond an author’s lifetime).

257. See Kaplow & Shavell, *supra* note 240, at 751, 774 (arguing that pollution taxes are more efficient than tradable permits and claiming that their article clarifies “conceptual understanding of property rules versus liability rules”).

258. See, e.g., *id.* at 750 (pointing out that in the pollution context difficulties in assessing harm pose as great a problem for calibration of property rules as for calibration of liability rules).

259. See, e.g., Gary Yohe, *Lessons for Mitigation from the Foundations of Monetary Policy in the United States*, in HUMAN-INDUCED CLIMATE CHANGE, 294–302 (Michael E. Schlesinger et al. eds. 2007) (proposing that climate policy should be based on the foundational principles underlying U.S. monetary policy).

260. By a macroeconomic legal theory, as will become evident below, I mean something different from simple application of existing monetary policy to law. Cf. Kelman, *supra* note 11 (explaining why existing macroeconomics focused primarily on monetary policy does not help legal theory very much). Rather, I advocate use of macroeconomic goals to reorient law and economics combined with techniques aimed at enhancing our ability to have law contribute something to these goals’ realization apart from the monetary policy that has dominated conventional macroeconomics.

261. DRIESEN, *supra* note 10.

262. See, e.g., *id.* at 50 (showing that policymakers implemented policies shifting the direction in which our economy was headed—“straight down”—following the start of the financial crisis).

headed in and counter important negative developments when a government response has promise.<sup>263</sup> This contrasts with a focus on law as a mere transaction.

The goal of a macroeconomic approach useful for a variety of areas of law involves avoiding systemic risks while keeping open a reasonably robust set of economic opportunities.<sup>264</sup> I argue below that these goals are both more meaningful and more achievable than the goal of economic efficiency.

Finally, in analyzing trends potentially meriting legal remedies we should employ economic dynamic analysis—a form of institutional economic analysis used by leading scholars but not yet formally recognized. This approach, as we shall see, can help us see and avoid systemic risks while giving us meaningful information about a legal rule's consequences. The material below first discusses the changes in focus, goals, and methods sketched above and then closes with some general comments about the economic dynamic theory's limits and possible objections (which receive more thorough treatment in *The Economic Dynamics of Law*).

#### A. Focusing on the Shape of Change Over Time

Analysts should focus their attention on the shape of change over time, rather than on near term costs and benefits.<sup>265</sup> The economists and law professors who predicted the financial crisis focused on the direction of changes they were observing and recommended policy measures that would have ameliorated or avoided the crisis.<sup>266</sup> Similarly, policymakers prevented the crisis from being worse by bailing out or nationalizing banks. In doing this, they did not calculate the costs and benefits of bank rescues. They could not calculate the economic benefits of preventing large financial institutions' failure or foresee the ultimate cost (after potential repayments) of financial rescues. They did, however, observe that we were headed in the wrong direction and that absent some kind of intervention, we were headed toward a drastic depression. This is but one example of cases where understanding the dynamics of systems proves better than treating legal decisions as if they are ordinary transactions. Law exists in part to correct market actors' myopia, not to mimic it. So, focusing on the shape of change over time provides us with an appropriate focus for designing legal reforms.

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263. See *id.* at 51 (defining the institutional economic concept of “path dependence,” which focuses on evaluating the direction of the path that society is on, and stressing the concept's importance).

264. See *id.* at 6–7; DOUGLAS C. NORTH, INSTITUTIONS, INSTITUTIONAL CHANGE, AND ECONOMIC PERFORMANCE 81 (1990) (arguing for the goal of “adaptive efficiency”—maximizing our future flexibility to enable growth and experimentation); cf. CASS R. SUNSTEIN, WORST CASE SCENARIOS 10 (2007) (suggesting that societies will likely reach “incompletely theorized agreements” to take action when facing likely catastrophes).

265. See JED RUBENFELD, FREEDOM AND TIME: A THEORY OF CONSTITUTIONAL SELF-GOVERNMENT 85 (2001) (pointing out that law exists “*over time*,” because law implies that after a rule is established it is followed).

266. See, e.g., NATIONAL COMMISSION, *supra* note 56, at 17–19; Baker, *supra* note 214 (noting the build-up of a housing bubble and predicting the housing sector's collapse with big consequences for the economy); Mihm, *supra* note 214 (describing Nouriel Roubini's prediction of the pending financial crisis); Stout, *supra* note 136, at 709 (recommending regulation of derivatives); Wilmarth, *supra* note 125, 454–75 (describing inadequacies in the legal structure created through deregulation).

*B. Avoiding Systemic Risk While Keeping Open a Reasonably Robust Set of Economic Opportunities*

We cannot expect government to magically produce a static equilibrium in a complex world. But we do expect governments to avoid man-made disasters. That basic minimum expectation justifies attention to national security, but it also plays a role in financial regulation, climate disruption law, and much else.<sup>267</sup> Hence, a basic economic goal of government involves avoiding systemic risk.

Economists typically use the term “systemic risk” to denote risks of serious economy-wide problems—those producing widespread major declines in output and employment.<sup>268</sup> But the term literally refers to other kinds of systems as well. Hence, the goal of avoiding systemic risks refers to avoiding risks of the collapse of key ecological, political, and social systems as well.<sup>269</sup>

This goal of avoiding systemic risk matters a lot more than the goal of achieving a static equilibrium. A model of an optimal market may prove very useful in the study of markets. But equilibria come and go as technology and other factors change, and therefore make achievement of optimality an elusive and relatively unimportant goal for laws regulating complex systems. Richard Posner has defended economic efficiency as a cause of “wealth maximization.”<sup>270</sup> But economic change through innovation matters far more to economic growth than efficiency.<sup>271</sup> This move of claiming that efficiency maximizes wealth conflates the macroeconomic goal of growth with the microeconomic goal of efficiency.<sup>272</sup> In any event, absent collapse of a major system, people can innovate and carry out activities that make things better. Once a major system collapses, however, their options become very limited. By contrast, inefficiency exists all the time in the economy and, while undesirable, this inefficiency does not constitute an insurmountable impediment to needed growth and change.<sup>273</sup>

Indeed, inefficiency plays an important role in the creative process that produces innovations increasing wealth.<sup>274</sup> Amazon, for example, engaged in numerous inefficient

267. See DRIESEN, *supra* note 10, at 59.

268. See Stefan Gerlach, *Defining and Measuring Systemic Risk* 3–4 (November 23, 2009), <http://www.europarl.europa.eu/document/activities/cont/200911/20091124ATT65154/20091124ATT65154EN.pdf>. I do not mean to imply that economists have agreed upon a definition of the term. See Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 196–98 (2008) (discussing competing definitions).

269. See Ruhl, *supra* note 152, at 563 (describing a systemic risk as “cascading” failures in a network leading to catastrophe).

270. See Posner, *Value of Wealth*, *supra* note 44, at 244; Posner, *Ethical and Political Basis*, *supra* note 44; cf. Posner, *supra* note 46, at 90 (characterizing wealth maximization as a “reasonable goal” for society).

271. See ROBERT D. COOTER, *THE FALCON’S GYRE: LEGAL FOUNDATIONS OF ECONOMIC INNOVATION AND GROWTH* 1.6 (2014) (attributing most of the growth of the last 100 years to innovation); MICHAEL A. CARRIER, *INNOVATION FOR THE 21<sup>ST</sup> CENTURY: HARNESSING THE POWER OF INTELLECTUAL PROPERTY AND ANTITRUST LAW* 31–33 (2009) (discussing the impact of economic growth versus economic efficiency on innovation in economic theory).

272. See Robert H. A. Ashford, *Socioeconomics and Professional Responsibilities in Teaching Law-Related Economic Issues*, 41 SAN DIEGO L. REV. 133, 150–52 (2004) (pointing out that efficiency theory is not a theory of general growth or wealth maximization).

273. See Gregory Scott Crespi, *Exploring the Complicationist Gambit: An Austrian Approach to the Economic Analysis of Law*, 73 NOTRE DAME L. REV. 315, 329 (1998) (indicating some economists’ belief that the economy is constantly in “disequilibrium”).

274. See DE SOTO, *supra* note 207, at 10 (arguing that inefficiency drives entrepreneurship and innovation).

money-losing transactions in order to establish e-commerce as a viable business.<sup>275</sup> Other innovations require experimentation producing horrific losses before they prove successful.<sup>276</sup> A willingness to experiment, which plays an important role in innovation, implies the possibility of inefficient business ventures producing failures. Not only does success often depend upon failure, but the whole theory of a perfect market is in some tension with the dynamics of innovation that produce economic growth. Economists debating market structure have pointed out that a perfectly efficient economy would not produce the profits necessary to fund research and development.<sup>277</sup> One need not settle the debate between proponents of large business and advocates of more competitive markets with many small players as innovation drivers to see that the lack of profit in a perfectly efficient economy would hinder capital formation needed for research and development.

That said, in choosing how to avoid systemic risks, we must try to keep open a reasonably robust set of economic opportunities. We would not want to create one catastrophe as we sought to avoid another. And, in some areas of law, intellectual property and antitrust, for example, the goal of keeping open a robust set of economic opportunities will matter more than systemic risk avoidance. Law cannot achieve perfectly efficient outcomes in regulatory areas of great complexity, but it usually can help us avoid systemic risk while keeping open a reasonably robust set of economic opportunities.

### *C. Economic Dynamic Analysis*

An economic dynamic approach not only involves macroeconomic goals and a focus on change over time, but also development of methods appropriate for future-oriented economic analysis useful for legal decision-making. The method I have identified builds on a key insight of traditional law and economics, namely that economic incentives are important.<sup>278</sup> This insight has been so widely accepted that nobody thinks about it much. This inattention often produces primitive analysis that simply points out that law *X* creates an incentive to do *Y* and stops there. But really good analysts do not usually stop there; they carry out what I call an economic dynamic analysis of law. This approach provides a systematic way to both detect trends requiring countervailing measures and to appreciate the potential consequences of proposed legal reforms.

An example will help make economic dynamic analysis more concrete. The United States tax code often taxes married couples at a higher rate than the two spouses would pay if they remained single.<sup>279</sup> The standard “analysis” simply points out that the “tax on marriage” creates an incentive to remain single and stops there.

An economic dynamic approach, however, demands that we take into account the bounded rationality of the institutions or individuals a given law regulates in order to see if they will pay attention to the incentives law creates. Nobody has enough time to pay attention to all nominally relevant incentives, so individuals and institutions usually only

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275. See DAVID M. DRIESEN, *THE ECONOMIC DYNAMICS OF ENVIRONMENTAL LAW* 93–94 (2003).

276. *Id.* at 94–95 (discussing the examples of FedEx and Dow Chemical).

277. See F.M. SCHERER, *SCHUMPETER AND PLAUSIBLE CAPITALISM*, reprinted in *THE ECONOMICS OF TECHNOLOGICAL CHANGE* 83 (Edwin & Elizabeth Mansfield eds., 1993) (noting that “the incentives for innovation are almost surely inadequate in . . . competitive markets”).

278. See POSNER, *supra* note 15, at 4 (deriving “fundamental” economic concepts from “the proposition that people respond to incentives”).

279. See generally Lawrence Zelenak, *Doing Something About Marriage Penalties: A Guide for the Perplexed*, 54 *TAX. L. REV.* 1 (2000) (explaining the so-called tax on marriage).

pay attention to the information that their habits, routines, and identities make relevant. So, in this example, an analyst should ask whether couples contemplating marriage consider the tax code. If not, then the law will not discourage marriage.

Even if it turns out that couples study the tax code carefully before deciding whether to tie the knot, one would want to ask if countervailing incentives would ameliorate or even cancel out the law's effects. Perhaps love and desire (in this example) countervail the tax codes enticements to remain single. Thus, consideration of countervailing incentives helps predict the actual effect of economic incentives.

These core elements of considering the precise bounds of rationality influencing discrete groups of regulated actors and countervailing incentives offer a coherent approach to improving a lot of law and economic analysis. I have explained elsewhere that Ian Ayres and Robert Gertner tacitly employ such an approach in order to develop widely admired insights into default rules in corporate and contract law.<sup>280</sup> I have also shown that the economic dynamic approach lies at the heart of the most insightful analysis of very complex laws governing new source review under the Clean Air Act.<sup>281</sup> These elements seem simple, but their deployment constitutes a major improvement over much economic analysis of law.

I have also shown that the analysts who predicted the financial crisis, including the economists Nouriel Roubini and Dean Baker and the legal scholars Arthur Wilmarth and Lynn Stout, basically used an analysis of economic dynamics to see this.<sup>282</sup> I do not mean to suggest that this method's use ensures prescience. But focusing on the shape of change over time and systematically examining the economic dynamics of a system with attention to institutional considerations greatly increases the likelihood of spotting significant problems. Conversely, putting a lot of energy into quantitative modeling can create an inordinate focus on good data sets that make it easy to miss qualitatively important information.

Richard Posner's effort to retrospectively cast market behavior creating a crisis as rational only heightens the defects of a flat rational actor model as a guide to legal reform. One can, if one likes, call exuberance during a bubble and fear during a panic rational after the fact. But unless one actually builds these specific behaviors into models seeking to map out the consequences of developing trends (or responses to proposed laws) before they have played out, the model will miss them. After the crisis, Posner endorsed Keynes, a macroeconomist who wrote about the effects of "animal spirits" on markets.<sup>283</sup> But that concession implies that analysts must consider which behaviors Posner considers rational will likely prevail in varying circumstances and take them into account. In other words, defining the bounds of rationality for relevant groups matters.<sup>284</sup>

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280. See David M. Driesen, *Contract Law's Inefficiency*, 6 VA. L. & BUS. REV. 301, 336–39 (2012) (discussing Ayres and Gertner's work on default rules); Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87, 87–105 (1990).

281. See DRIESEN, *supra* note 275, at 187–192.

282. See DRIESEN, *supra* note 10 at 81–82; see also Stout, *supra* note 136, at 709, 735–62; Wilmarth, *supra* note 125, at 392–407, 414–28.

283. See generally Richard A. Posner, *How I Became a Keynesian*, NEW REPUBLIC (Sept. 23, 2009), <http://www.newrepublic.com/article/how-i-became-keynesian>.

284. Cf. DRIESEN, *supra* note 10, at 197–98, 205–06 (commending the use of scenario analysis to supplement this method for very important legal changes).

*D. Economic Dynamics' Limits and Some Potential Objections*

One might think that economic dynamic theory has nothing at all to say outside of the complex areas I addressed here. I am here focused on areas characterized by complexity where regulations often address a large number of potential transactions at one blow—like financial regulation, intellectual property, and environmental law. But I explained elsewhere that the economic dynamic approach can apply to common law areas like property and contract.<sup>285</sup> Dynamic problems do arise in these areas. For example, contract enforcement cases usually arise because something happens after contract formation that makes contemplated performance unattractive.<sup>286</sup> In other words, enforcement occurs when a transaction that both parties once thought would prove Pareto optimal ceases to be so. In that case, the typical role of courts involves enforcement of *inefficient* transactions.<sup>287</sup> I argued that for that reason we might understand contract law as an effort to provide a robust set of economic opportunities, rather than as an effort to achieve efficient outcomes at the time a case is decided.<sup>288</sup> Even if law and microeconomics illuminates some common law issues, the economic dynamic approach still casts fresh light on some old problems and calls our attention to some new ones.

The economic dynamic approach has value even in cases where we must make economic efficiency a goal, such as in regimes regulating the delivery of essential services (e.g. regulation of utilities). It helps us see and critically evaluate questions about tradeoffs between static efficiency and economic growth, like whether we have found the right balance between cheap telecommunication services and support for adequate investment in innovation.<sup>289</sup> In evaluating questions like these, we need both careful empirical studies that go beyond simply assuming that “competition” ensures good outcomes (especially in industries characterized by limited competition). We need to look at the economic dynamics of relevant systems and whether specific reforms might help make those systems perform better.

My argument that even in avoiding systemic risks society must keep open a robust set of economic opportunities opens up some questions about how to take into account the collateral negative consequences of avoiding systemic risk. By questioning the efficiency goal for law in complex contexts, I do not mean to imply that law should not take into account the advantages and disadvantages of competing legal reforms. I just mean to claim that equating costs and benefits at the margin does not work for reforms addressing complex matters subject to change over time.

My previous work on economic dynamics points to several possible techniques for responding to potential negative collateral consequences. One involves choosing alternatives that effectively address systemic risk without shutting off crucial economic

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285. See generally *id.* at 99–136 (applying economic dynamic theory to contract and property); Driesen, *supra* note 280 (applying economic dynamic theory to contract).

286. See Driesen, *supra* note 280, at 308 (discussing this problem).

287. See *id.* at 304.

288. See *id.* at 311–15 (arguing for viewing contract in this more macroeconomic light); see also Alan O. Sykes, *The Doctrine of Commercial Impracticability in a Second-Best World*, 19 J. LEGAL STUD. 43, 44, 75 (1990) (finding no judicial interest in efficiency in impracticability cases).

289. See BRETT M. FRISCHMANN, *INFRASTRUCTURE: THE SOCIAL VALUE OF SHARED RESOURCES* 184–86 (2012) (discussing the tension between encouraging incumbent firms to invest in innovation and policies that promote network access to facilitate competition).



opportunities when possible.<sup>290</sup> Another involves building exceptions into legal reforms to eliminate potential disadvantages.<sup>291</sup> I also argue that in those few cases when all available methods of avoiding significant systemic risk creates other systemic risks, one can sometimes make judgments based on the relative likelihood of the risk manifesting itself, even though the magnitudes of consequences or of probabilities are unknown.<sup>292</sup>

*The Economic Dynamics of Law* works through potential objections to the economic dynamic approach in greater detail.<sup>293</sup> My primary goal in this Article, however, involves calling attention to how complexity and institutional considerations defeat allocative efficiency as a predominant goal for laws governing complex systems. The economic dynamic approach described shows that we can adapt macroeconomic thinking, where we counter negative trends and try to create economic opportunity, to legal reform. This means that we can have a theory that focuses on important and often achievable goals.

#### V. CONCLUSION

In a host of legal areas, complex dynamics defeat efforts to achieve optimality. They do so both because the phenomena under analysis defy quantitative analysis and because government regulation usually provides a general framework yielding uncertain results. At least in these areas, we need to abandon as unrealistic and myopic the habit of treating law as if it were a mere transaction controlling allocation of a set of resources.

Instead, we need to focus law and economics on the important goals of avoiding systemic risk while keeping open a reasonably robust set of economic opportunities. I have proposed an economic dynamic approach that fleshes out what such a macroeconomic approach might look like if adapted to law's needs. The financial crisis teaches us that the old approach to regulating complex systems failed. We desperately need an approach to law and economics that treats law as an institution that addresses the complex problems that society actually confronts in an appropriate and realistic way.

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290. DRIESEN, *supra* note 10, at 72–73.

291. *See id.* at 71 (explaining that the law creates exceptions in order to avoid collateral negative consequences).

292. *See id.* at 71–72 (using the example of the choice between deploying nuclear power and facing climate disruption to illustrate this problem).

293. *See id.* at 68–78 (discussing some potential objections and providing additional detailed support).