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Spring 2011

The Coming Extinction of Homo Economicus and the Eclipse of the Chicago School of Antitrust: Applying Evolutionary Biology to Structural and Behavioral Antitrust Analyses

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The Coming Extinction of *Homo Economicus* and the Eclipse of the Chicago School of Antitrust: Applying Evolutionary Biology to Structural and Behavioral Antitrust Analyses

Thomas J. Horton*

“[I]f we should surrender our genetic nature to machine-aided ratiocination, and our ethics and art and our very meaning to a careless discursion in the name of progress, imagining ourselves godlike and absolved from our ancient heritage, we will become nothing.”

— Edward O. Wilson¹

I. INTRODUCTION

Evolutionary biology has much to teach us about antitrust regulation in our complex, free-market economy.² Why should we look to

* Assistant Professor, University of South Dakota School of Law. The author wishes to thank Tom Geu, Steven Benz, Maurice Stucke, Spencer Weber Waller, Eleanor Fox, Bob Lande, Bernie Hollander, and Dr. Mariano Garcia-Blanco for their helpful comments and inspiration; and Stephannie Bonaiuto, Teresa Carlisle, and Jessica Fjerstad for their able and assiduous efforts. The author wishes to additionally thank Dean Vickrey and the University of South Dakota School of Law for their summer research grant.

1. EDWARD O. WILSON, *CONSILIENCE: THE UNITY OF KNOWLEDGE* 298 (1998).

2. See, e.g., Gregory T. Gundlach & Albert A. Foer, *Complexity, Networks and the Modernization of Antitrust: The American Antitrust Institute's Roundtable on the Science of Complexity and Antitrust*, 51 ANTITRUST BULL. 1, 2 (2006) (“Incorporating insights and relying on metaphors from population ecology, evolutionary biology, systems theory, chaos theory, and the study of networks, the science of complexity attempts to describe and explain how systems and their occupants, including industries and firms, evolve and compete against one another over time through adaptation, coevolution and other dynamic processes.”); Thomas J. Horton, *Competition or Monopoly? The Implications of Complexity Science, Chaos Theory, and Evolutionary Biology for Antitrust and Competition Policy*, 51 ANTITRUST BULL. 195, 213 (2006) (“Complexity science, chaos theory, and evolutionary biology help us understand that competition and the diversity it spawns through increased adaptability are fundamental to increasing the overall productivity and stability of both biological ecosystems and complex business networks.”); Ian F. Wilkinson, *The Evolvability of Business and the Role of Antitrust*, 51 ANTITRUST BULL. 111, 114 (2006) (“I believe that ideas from complexity theory and theories of cultural evolution can help enrich and advance our understanding of the key processes driving the evolution of firms, markets, and industries and provide a more coherent focus for antitrust policy.”).

evolutionary biology for guidance?³ Within the evolutionary biology literature, we find a well-documented and researched record of millions of years of head-to-head structural and behavioral competition, adaptation, and evolution in the most complex systems imaginable: the living ecosystems throughout our planet.⁴ This article argues that the models and lessons learned from evolutionary biology can provide fresh and useful insights regarding structural and behavioral economic competition and antitrust policy.⁵

The question of how evolutionary biology can help us seems especially relevant when one considers that “[t]he interaction between

3. See, e.g., Horton, *supra* note 2, at 197 (“We should continue to look at the teachings of complexity science, chaos theory, and evolutionary biology to better understand our complex competitive economic system and to identify emergent forms of order. In so doing, we will gain a greater appreciation for the importance of diversity and ongoing competition at all levels of our economic system.”); Manfred D. Laubichler & Jane Maienschein, *Evolution and Society*, in *EVOLUTION: THE FIRST FOUR BILLION YEARS* 330, 344 (Michael Ruse & Joseph Travis eds., 2009) (“The merging of economic theory with evolutionary theory benefits both fields.”); Egbert Giles Leigh, Jr. & Geerat Jacobus Vermeij, *Does Natural Selection Organize Ecosystems for the Maintenance of High Productivity and Diversity?*, *PHIL. TRANSACTIONS ROYAL SOC’Y LOND. B* 709, 713 (2002) (“Economics studies relationships within a single species; ecology, relationships among many species. . . . Nonetheless, economists and ecologists ask similar questions. Both are concerned with productivity.”); see also William F. Shughart II, *Public-Choice Theory and Antitrust Policy*, in *THE CAUSES AND CONSEQUENCES OF ANTITRUST: THE PUBLIC-CHOICE PERSPECTIVE* 7, 9–11 (Fred S. McChesney & William F. Shughart II eds., 1995) (“The model of public choice insists that the same rational, self-interest seeking motives that animate human action in ordinary markets be applied to decision making in the public sector as well. . . . In short, *homo politicus* and *homo economicus* are the same. . . . To public-choice scholars, economic markets and political markets are one and the same in the sense that the individuals who interact in these markets are motivated by similar goals and their behavior can be analyzed with the same set of tools.”).

4. As noted by eminent sociobiologist Edward O. Wilson:

The greatest challenge today, not just in cell biology and ecology, but in all of science, is the accurate and complete description of complex systems. . . . Organisms and their assemblages are the most complex systems known. They are also self-assembling and adaptive. Living systems in general, by constructing themselves from molecule to cell to organism to ecosystem, surely display whatever laws of complexity and emergence lie within our reach.

WILSON, *supra* note 1, at 85–87; see also STUART A. KAUFFMAN, *THE ORIGINS OF ORDER: SELF-ORGANIZATION AND SELECTION IN EVOLUTION*, at xii–xv (1993) (“Selection achieves and maintains complex systems poised on the boundary or edge, between order and chaos. . . . The typical, or generic, properties of such poised systems emerge as potential ahistorical universals in biology.”).

5. See also ERIC D. BEINHOCKER, *THE ORIGIN OF WEALTH: EVOLUTION, COMPLEXITY, AND THE RADICAL REMAKING OF ECONOMICS* 187 (2006) (“Businesspeople, journalists, and academics all gravitate naturally to using images of ecosystems and evolution when they talk about the economy. One of the strongest claims of Complexity Economics is that this language is no mere metaphor—organizations, markets, and economies are not just like evolutionary systems; they truly, literally are evolutionary systems.”).

antitrust and economics is increasingly intimate.”⁶ By looking to evolutionary biology, we can begin to extricate ourselves from the suffocating straitjacket of neoclassical economics and its unrealistically static models, which “while elegant cabinet specimens of applied mathematics, largely ignore human behavior, as understood by contemporary psychology and biology. Lacking such a foundation, they often describe abstract worlds that do not exist.”⁷ Indeed, numerous scholars have recommended a more interdisciplinary approach to economic issues.⁸

Part II of this article examines the various models and lessons from evolutionary biology and analyzes their potential applicability to the field of antitrust.⁹ It first admonishes us to be wary of “misapplying

6. Lawrence A. Sullivan, *Economics and More Humanistic Disciplines: What Are the Sources of Wisdom for Antitrust?*, 125 U. PA. L. REV. 1214, 1214 (1977); see also Eleanor M. Fox, *The Politics of Law and Economics in Judicial Decision Making: Antitrust as a Window*, 61 N.Y.U. L. REV. 554, 555 (1986) (“It is often assumed that antitrust law is a function of economics . . .”); Michael S. Jacobs, *An Essay on the Normative Foundations of Antitrust Economics*, 74 N.C. L. REV. 219, 221–22 (1995) (“[B]y 1987, Chicago partisans could proudly proclaim that ‘antitrust law has become . . . a branch of economics’; and by 1993, a non-aligned scholarly observer could plausibly conclude that ‘today we tend to view antitrust in technocratic terms.’ Drained of its vitality, the old debate between Chicago’s exclusively economic viewpoint and the socio-political perspective of its Modern Populist critics has lately ceded priority of place to an intramural dispute between antitrust economists.”).

7. WILSON, *supra* note 1, at 290; see also ROALD HOFFMAN, *THE SAME AND NOT THE SAME* 20–21 (1995) (“[E]ven in two ‘hard natural science’ fields as close to each other as chemistry and physics, even *there* there are concepts in chemistry which are not reducible to physics. . . . [Many] constructs have a tendency to wilt at the edges as one tries to define them too closely. They cannot be mathematicized, they cannot be defined unambiguously. . . . The world out there is refractory to reduction, and if we insist that it must be reducible, all that we do is put ourselves into a box.”).

8. See, e.g., Thomas Earl Geu, *Policy and Science: A Review Essay of Wilson’s Consilience: The Unity of Knowledge*, 44 S.D. L. REV. 612, 624 (1999) (“The importation and uses of sciences, social sciences, and philosophies from outside law should not surprise us.”); Richard A. Posner, *Decline of Law as an Autonomous Discipline: 1962–1987*, 100 HARV. L. REV. 761, 777 (1987) (“I do think, though, that the law was too parochial twenty-five years ago and that despite all of the false starts and silly fads that have marred its reaching out to other fields, the growth of interdisciplinary legal analysis has been a good thing, which ought to (and will) continue.”); Sullivan, *supra* note 6, at 1214 (“My thesis is that antitrust scholarship could usefully explore the styles of analysis and some of the material from the humanistic disciplines of history and philosophy, and that it might be useful to draw upon social sciences other than economics, particularly on sociology and political science.”); *id.* at 1243 (“The scholarly agenda is a large one, and transcends, I think, the adaptation of conventional economic analysis, however important that task may be.”).

9. See, e.g., BEINHOCKER, *supra* note 5, at 18–19 (“[M]any biologists have come to view evolutionary systems as just one particular type, or subclass, of complex adaptive systems. Social scientists following this work increasingly began to wonder whether economics too might be a type of complex adaptive system. The most obvious characteristic of economics is that they are collections of people interacting with each other in complex ways, processing information, and adapting their behaviors. . . . Interest and research in understanding the economy as a

scientific theories and erroneous assumptions to support” what are really implied values.¹⁰ It then describes how the Chicago School of antitrust’s (“Chicagoans”) economic models are aligned with the misguided tenets of Social Darwinism, and recommends applying the large and growing body of updated evolutionary biology literature as a more appropriate lens for examining economic competition, cooperation, and evolutionary success and failure.¹¹ It may “be years—decades, most likely—before these new beginnings in borrowing from biology come together to give a better understanding of the overarching processes of economic growth.”¹² Nevertheless, the time is ripe “to broaden our approach, to incorporate ecological thinking and ecological values with market thinking and values.”¹³

Part III applies current principles of evolutionary biology to structural issues in antitrust such as concentration and monopolies.¹⁴ Using an

complex adaptive system has grown rapidly over the past decade”); GEERAT J. VERMEIJ, *NATURE: AN ECONOMIC HISTORY* 4 (2004) (“Humans are without question the most powerful economic entity that has yet evolved on earth. . . . Yet, in spite of all these unique qualities and institutions, our species and the economic and social system we have created follow all the same fundamental rules that govern other life forms and their economic structures. Like other living things, we too are ruled by conflicts of interest, cooperative behavior, adaptation, unequal outcomes of trade, the disproportionate influence of the rich and powerful, and the vagaries of resource supply that dictate when and where opportunities are created and constraints are imposed.”); Thomas Earl Geu, *Chaos, Complexity and Coevolution: The Web of Law, Management Theory, and Law Related Services at the Millennium*, 65 TENN. L. REV. 925, 927 n.4 (1998) (citing a series of articles “on the subjects of chaos theory, complexity theory, [Complex Adaptive Systems] theory, and the law”).

10. Horton, *supra* note 2, at 206–07. This point is especially important because “personal implied values and assumptions [generally] drive the thinking about competition and antitrust regulation.” *Id.* at 205; *see also* Fox, *supra* note 6, at 556–57 (“[I]n the context of antitrust adjudication, the use of economics to define the questions and to derive their answers is subject to a wide range of indeterminacy and manipulation”); Jacobs, *supra* note 6, at 225–26 (“[T]he contemporary debate between antitrust economists demonstrates how efforts to base antitrust policy solely upon economic theory inevitably draw on political assumptions about the marketplace and the proper role of enforcement authorities.”).

11. *See, e.g.*, KIM STERELNY, *Philosophy of Evolutionary Thought*, in *EVOLUTION: THE FIRST FOUR BILLION YEARS*, *supra* note 3, at 313, 319 (“[T]he perspective of the biological sciences and the social sciences are both valid, and they need somehow to be part of a single unified framework for thinking about human agency”); VERMEIJ, *supra* note 9, at x (“Whether our field is natural history, human history, evolutionary biology, or economics, we grapple with similar phenomena. . . . We deal with stabilizing tradeoffs and destabilizing positive feedbacks, and the destructive effects of rare disturbances.”); *id.* at 3–4 (“[T]he human species and the human economy do not differ fundamentally from units encountered in the rest of the biosphere.”).

12. David Warsh, Op-Ed., *Borrowing from Biology to Explain the Economy*, WASH. POST, Jan. 1, 1991, at E2.

13. James Eggert, Op-Ed., *A Silence of Meadowlarks: Can A Songbird’s Demise Lead Us to a Better Economics?*, WASH. POST, Aug. 4, 1991, at C3.

14. By necessity, much of the interdisciplinary consilience between evolutionary biology,

evolutionary biology perspective, this article contends that large economic concentrations such as monopolies and oligopolies are vastly overrated in terms of their overall efficiency and positive impacts on the current economic system,¹⁵ and that their dangerous impacts are increasingly underrated.¹⁶

Part IV discusses competitive behavior from an evolutionary biology perspective.¹⁷ The evolution of ethics, morals, fairness, and justice in

complexity science and economics uses metaphors. "There is, however, a debate in legal scholarship as to how exactly metaphors work." Spencer Weber Waller, *The Law and Economics Virus*, 31 CARDOZO L. REV. 367, 371 n.14 (2009). Professor Waller observes that some "scholars and philosophers do not view metaphors in cognitive terms, but still recognize that they are powerful organizational devices that can give rise to surprising new meanings . . . [or] jolt one out of an unquestioning frame of reference." *Id.* Professor Tom Geu, for example, argues that "metaphors are the language of 'scientific' explanation because science (like law) 'is an attempt to explain phenomena that cannot be experienced directly by human beings, by reference to forces and processes that we cannot perceive directly.'" Thomas Earl Geu, *A Single Theory of Limited Liability Companies: An Evolutionary Analysis*, 42 SUFFOLK U. L. REV. 507, 509 (2009) (quoting RICHARD LEWONTIN, *THE TRIPLE HELIX: GENE, ORGANISM, AND ENVIRONMENT* 3 (2000)).

15. See, e.g., WALTER ADAMS & JAMES W. BROCK, *THE BIGNESS COMPLEX: INDUSTRY, LABOR AND GOVERNMENT IN THE AMERICAN ECONOMY* 303 (2004) ("[W]hen economic performance is actually examined, we have seen, it casts serious doubt on the assertion that bigness is the guarantor of operating efficiency, innovation efficiency, or social efficiency."); Richard Nelson et al., *The Concentration of Research and Development in Large Firms, in MONOPOLY POWER AND ECONOMIC PERFORMANCE: THE PROBLEM OF INDUSTRIAL CONCENTRATION* 45, 48–50 (Edwin Mansfield ed., 1968) ("[A]mong firms big enough to appear on Fortune's 1955 list, the largest firms supported inventive and innovative activity less intensively relative to their size than did small firms."); F. M. Scherer, *Antitrust, Efficiency, and Progress, in REVITALIZING ANTITRUST IN ITS SECOND CENTURY: ESSAYS ON LEGAL, ECONOMIC, AND POLITICAL POLICY* 130, 148 (Harry First et al. eds., 1991) ("[I]t is fairly certain that giant monopolistic enterprises are not superior engines of technological progress."); George J. Stigler, *The Case Against Big Business, in MONOPOLY POWER AND ECONOMIC PERFORMANCE: THE PROBLEM OF INDUSTRIAL CONCENTRATION, supra*, at 3, 8 ("[B]ig businesses are generally no more and no less efficient than medium-sized businesses even when the gains wrung by monopoly power are included in efficiency.").

16. See, e.g., ESTES KEFAUVER, *IN A FEW HANDS: MONOPOLY POWER IN AMERICA* 3 (1965) ("Every day in our lives monopoly takes its toll. Stealthily it reaches down into our pockets and takes a part of our earnings. . . . Excessive prices constitute one important consequence of monopoly. . . . In addition, monopoly permeates the society and affects us in other diverse ways."); BARRY C. LYNN, *CORNERED: THE NEW MONOPOLY CAPITALISM AND THE ECONOMICS OF DESTRUCTION* 17–22 (2010) (discussing various ways large corporations achieve monopolies in the present economy); Maurice E. Stucke, *Should the Government Prosecute Monopolies?*, 2009 U. ILL. L. REV. 497, 500 (2009) (citing *United States v. Aluminum Co. of Am.*, 148 F.2d 416, 428 (2d Cir. 1945)); Geerat J. Vermeij, *Comparative Economics: Evolution and the Modern Economy*, 11 J. BIOECONOMICS 105, 128 (2009) ("[P]olicies of [economic] concentration are both risky and inconsistent with the lessons from the economics of nature."); Geerat J. Vermeij, *From Phenomenology to First Principles: Toward a Greater Theory of Diversity*, 56 PROC. CAL. ACAD. SCIS. 12, 20 (Supp. I 2005) ("Environments and regions in which competition and adaptation are least constrained produce the species with the highest competitive, defensive, and reproductive performance.").

17. The author wishes to acknowledge the influence of the growing body of superb research

human relationships, including economic relationships, has buttressed our long-term survival and evolutionary success.¹⁸ Reciprocity, fairness, and the laws of comparative advantage provide the foundation for successful long-term human interactions.¹⁹ To monitor reciprocity and fairness, humans have developed acute abilities to detect cheating, free-riding, and unfairness.²⁰ In treating *Homo economicus* as a rational

on the potential impacts of behavioral economics on antitrust. See generally Maurice E. Stucke, *Behavioral Economists at the Gate: Antitrust in the Twenty-First Century*, 38 LOY. U. CHI. L.J. 513 (2007); Avishalom Tor, *The Methodology of the Behavioral Analysis of Law*, 4 HAIFA L. REV. 237 (2008); Amanda P. Reeves & Maurice E. Stucke, *Behavioral Antitrust* (Univ. Tenn. Legal Studies Research Paper No. 106, 2010), available at <http://ssrn.com/abstract=1582720>. A review of these works is beyond the scope of this article.

18. See, e.g., ROBERT M. AXELROD, *THE EVOLUTION OF COOPERATION* 178–81 (1984) (noting that cooperation develops in business transactions without the need of a central authority due to the anticipation of mutually rewarding transactions in the future); BEINHOCKER, *supra* note 5, at 121 (“Humans have strongly ingrained rules about fairness and reciprocity that override calculated ‘rationality.’”); FRANS DE WAAL, *THE AGE OF EMPATHY: NATURE’S LESSONS FOR A KINDER SOCIETY* 196–200 (2009) (addressing the need for both kinds of fairness—the one that seeks to level the playing field and the other that connects reward and effort); STEPHEN S. HALL, *WISDOM: FROM PHILOSOPHY TO NEUROSCIENCE* 154 (2010) (“[A] sense of fairness is central to many of the decisions we make, including (but not limited to) economic behavior.”); STEVEN PINKER, *THE BLANK SLATE: THE MODERN DENIAL OF HUMAN NATURE* 193 (2002) (“Whatever its ontological status may be, a moral sense is part of the standard equipment of the human mind.”); MATT RIDLEY, *THE ORIGINS OF VIRTUE: HUMAN INSTINCTS AND THE EVOLUTION OF COOPERATION* 140–41 (1998) (“People care about fairness as well as self-interest. . . . The more you behave in selfless and generous ways the more you can reap the benefits of cooperative endeavor from society.”); VERMEU, *supra* note 9, at 55–57 (“Besides the capacity for intelligent design, humans have culturally evolved an elaborate system of ethics and morality, a code of individual and collective conduct The social contracts represented by legal codes and by systems of ethical and moral behavior enable humans to make decisions and policies with long-range benefits and not simply to favor short-term gains.”); Martin A. Nowak et al., *The Arithmetics of Mutual Help*, SCI. AM., June 1995, at 76–81 (arguing that cooperation is inherently present in all living organisms, including between the simplest molecules and humans, albeit with a varying degree of sophistication).

19. See, e.g., GEORGE A. AKERLOF & ROBERT J. SHILLER, *ANIMAL SPIRITS: HOW HUMAN PSYCHOLOGY DRIVES THE ECONOMY AND WHY IT MATTERS FOR GLOBAL CAPITALISM* 20–23 (2009) (“However many articles there have been on fairness, and however important economists may consider fairness, it has been continually pushed into a back channel in economic thinking. . . . But fairness may be just as important as the economic motivations that are given prime time. . . . [Studies] demonstrate that considerations of fairness can override rational economic motivation.”); Paul J. Zak, *Introduction*, in *MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY*, at xvii (Paul J. Zak ed., 2008) (“Our research revealed that most economic exchange, whether with strangers or known individuals, relies on character values such as honesty, trust, reliability, and fairness.”).

20. As observed by sociobiologist Edward O. Wilson, in humans, one capacity, the detection of cheating, is developed to exceptional levels of sharpness and rapid calculation. . . . More than error, more than good deeds, and more even than the margin of profit, the possibility of cheating by others attracts attention. It excites emotion and serves as the principal source of hostile gossip and moralistic aggression by which the integrity of the political economy is maintained.

WILSON, *supra* note 1, at 186–87; see also HALL, *supra* note 18, at 160–65 (“[A]n emotional part

self-interested utility and profit maximizer, neoclassical economists have gone against the most basic principles of humanness, and our attendant inborn and cultural standards of reciprocity, justice, and fairness.²¹

Building on the critique of neoclassical economics, this article predicts that *Homo economicus* will become extinct. As *Homo sapiens* replaces *Homo economicus* in antitrust analysis,²² the Chicago School's antitrust dominance²³ will come to a timely end.²⁴ Evolutionary biology refutes the Chicagoans' attempts to justify monopolies and

of our brains (the insula) discerns unfairness . . . while a more cognitive part of the brain (the [prefrontal cortex]) wheels into action to redress the social injustice . . . [;] the cognitive part of the brain is necessary to override selfishness, economic self-interest, and, if we want to be blunt about it, greed.”); BARBARA OAKLEY, *EVIL GENES: WHY ROME FELL, HITLER ROSE, ENRON FAILED, AND MY SISTER STOLE MY MOTHER’S BOYFRIEND* 259–60 (2008) (“[I]maging results have shown that we feel disgust (as evidenced by significant activation of the interior insula) when faced with the behavior of cheaters, and very real satisfaction (that is, activation of the caudate nucleus), when we punish those cheaters.”); ROBERT WRIGHT, *THE MORAL ANIMAL: EVOLUTIONARY PSYCHOLOGY AND EVERYDAY LIFE* 338–42 (1994) (“The new paradigm strips self-absorption of its noble raiment. . . . For the first time, we understand clearly how humans came to have this feeling that the desserts they dish out are just. . . . At the root of this feeling is the retributive impulse, one of the basic governors of reciprocal altruism.”).

21. FRANCIS FUKUYAMA, *THE GREAT DISRUPTION: HUMAN NATURE AND THE RECONSTITUTION OF SOCIAL ORDER* 160–62 (1999) (“[T]he fact that biology shares a great deal methodologically with economics has obscured the fact that the new evolutionary biology’s substantive conclusions are more supportive of *homo sociologus* than *homo economicus*. That is, it tends to show that humans are by nature political and social creatures, and not isolated and selfish individuals.”); see DE WAAL, *supra* note 18, at 222 (arguing that supply-side economists’ references to Adam Smith “are selective. They leave out an essential part of his thinking . . . ; namely that reliance on greed as the driving force of society is bound to undermine its very fabric. Smith saw society as a huge machine, the wheels of which are polished by virtue, whereas vice causes them to grate. The machine just won’t run smoothly without a strong community sense in every citizen. Smith frequently mentioned honesty, morality, sympathy, and justice, seeing them as essential companions to the invisible hand of the market.”).

22. See HALL, *supra* note 18, at 207 (“[A]lthough *Homo economicus* insists by definition on a narrow and material definition of ‘preference,’ *Homo sapiens* ultimately juggle a much more complicated set of values.”).

23. See, e.g., Waller, *supra* note 14, at 385 (“[M]any commentators argue we are all Chicago School now and that the Chicago School has absorbed most of the competing approaches Judge Posner and other commentators have forcefully continued to press the theme of convergence and Chicago School triumphalism in a wide variety of other writings and speeches.”). On the “near-total victory of the Chicago School approach to analyzing public regulation of price and entry,” see William F. Shughart II, *Retrospect and Prospect, in THE CAUSES AND CONSEQUENCES OF ANTITRUST: THE PUBLIC-CHOICE PERSPECTIVE*, *supra* note 3, at 319, 319–20.

24. Paul Krugman, Op-Ed., *How Did Economists Get It So Wrong?*, N.Y. TIMES, Sept. 6, 2009, at MM36 (“Brad DeLong of the University of California, Berkeley, writes of the ‘intellectual collapse’ of the Chicago School, and [Paul Krugman] ha[s] written that comments from Chicago School economists are the product of a Dark Age of macroeconomics in which hard-won knowledge has been forgotten.”).

ongoing predatory behavior.²⁵ Instead, it vindicates the antitrust laws' framers' laudable efforts to flexibly regulate human ethics and economic behavior.²⁶ Only by focusing on ethics, morals, and fairness²⁷ can society hope to build and sustain the flexible organizations and economic relationships that will enable corporations and businesses to thrive in today's global economy.²⁸

25. See Horton, *supra* note 2, at 214 (claiming that the Chicagoans' theory is divorced from reality and is inadequate in keeping dangerous anticompetitive acts and practices in check).

26. The framers of the Sherman Act intuitively understood and appreciated the evolutionary norms of fairness, trust, and reciprocity, as well as the barren ahistorical sterility of neoclassical economics. See, e.g., Eleanor Fox & Lawrence A. Sullivan, *Retrospective and Prospective: Where Are We Coming From? Where Are We Going?*, in REVITALIZING ANTITRUST IN ITS SECOND CENTURY: ESSAYS ON LEGAL, ECONOMIC, AND POLITICAL POLICY, *supra* note 15, at 2, 18 (“[T]he producer-plus-consumer welfare paradigm . . . is static and outcome-oriented, while the antitrust laws are dynamic and process-oriented. They protect not an outcome, but a process-competition. Antitrust laws set fair rules of the game. They give rights of access and opportunity. The antitrust laws preserve and foster dynamic interactions among those in the market. They deal not with aggregate national wealth, but with the expectations and behavior of the people who participate in the markets.”); John B. Kirkwood & Robert H. Lande, *The Chicago School's Foundation is Flawed: Antitrust Protects Consumers, Not Efficiency*, in HOW THE CHICAGO SCHOOL OVERSHOT THE MARK 89, 90 (Robert Pitofsky ed., 2008) (noting that the Sherman Act's intent was singular: to enhance economic efficiency); Paul J. Zak, *Values and Value: Moral Economics*, in MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY, *supra* note 19, at 259, 276 (“[T]he kinds of market institutions that create wealth and enable happiness and freedom of choice are those that resonate with the social nature of human beings who have an innate sense of shared values of right, wrong, and fair.”).

27. Frans de Waal, one of the world's best-known primatologists, argues that two “kinds of fairness—the one that seeks a level playing field and the one that links rewards to effort—are essential.” He further contends that “stressing one fairness ideal at the expense of the other” is a “false choice.” DE WAAL, *supra* note 18, at 198.

28. A considerable array of recent literature questions the long-term health and sustainability of our economic system under the Chicagoans' free-market theories in light of the financial collapse of 2008. See, e.g., YVES E. SMITH, ECONNED: HOW ENLIGHTENED SELF-INTEREST UNDERMINED DEMOCRACY AND CORRUPTED CAPITALISM 93 (2010) (“[T]he epitome of individualistic market behavior in fact has a social structure, an unwritten code of conduct, and moral guidelines . . . that runs counter to the predominant theory, namely that of neoclassical economics, of how markets operate.”); JOSEPH E. STIGLITZ, FREEFALL: AMERICA, FREE MARKETS, AND THE SINKING OF THE WORLD ECONOMY 260 (2010) (arguing that economics is a predictive science, and the Chicago School—and their free-market approach—failed to predict the recession or offer any real solution besides keeping government out of the way). To his credit, Chicagoan and Seventh Circuit Judge Richard A. Posner has been a leader of the current critics. See RICHARD A. POSNER, A FAILURE OF CAPITALISM: THE CRISIS OF '08 AND THE DESCENT INTO DEPRESSION, at xiv (2009) (asserting that ideology driven by self-interested decisions from the business community can distort economic policy and give rise to depression).

II. THE POTENTIAL APPLICABILITY OF EVOLUTIONARY BIOLOGY TO ANTITRUST

Analogies between biological and economic systems are nothing new.²⁹ Economists have long been fascinated by evolutionary and biological competition theories. “From Darwin’s³⁰ time onward, [economists] have been drawn to evolutionary ideas, and have often emphasized parallels between capitalism and the evolutionary struggle for life.”³¹ Studying complex social systems and their evolution presents “a paradigmatic case for interdisciplinary research.”³² Such disparate scholars as Iowa antitrust law professor Herbert Hovenkamp and the late Harvard paleontologist Stephen Jay Gould have gone so far as to claim that “Darwin’s theory of natural selection was an economic theory, not a biological one.”³³

Over the past thirty years, there have been increasing calls to join together the lessons from evolutionary biology and economics in a “consilience.”³⁴ “[M]any economists are trying to absorb lessons learned by [evolutionary biologists], psychologists, neuroscientists, and sociologists.”³⁵ As stated by Harvard sociobiologist Edward O. Wilson:

29. Niall Ferguson, *Economies Evolve, Too*, HOOVER DIGEST (Apr. 18, 2008), <http://www.hoover.org/publications/hoover-digest/article/5712>. Ferguson observes, “The notion that Darwinian processes may be at work in the economy was raised by Thorstein Veblen. . . . An academic journal has been devoted to the subject for the past 16 years.” *Id.*

30. It should be noted that Alfred Russel Wallace “independently discovered natural selection” and catalyzed Darwin’s publication of *On the Origin of Species* (after a twenty-year delay) by sending Darwin a short essay revealing his independent discovery. PHILOSOPHY AFTER DARWIN: CLASSIC AND CONTEMPORARY READINGS 17 (Michael Ruse ed., 2008).

31. VERMEIJ, *supra* note 9, at 43.

32. Laubichler & Maienschein, *supra* note 3, at 330, 343; *see also* David Quammen, *Was Darwin Wrong? No. The Evidence for Evolution is Overwhelming*, NAT’L GEOGRAPHIC MAG., Nov. 2004, at 2, 8, *available at* <http://ngm.nationalgeographic.com/2004/11/darwin-wrong/quammen-text> (“Evolution is both a beautiful concept and an important one, more crucial nowadays to human welfare, to medical science, and to our understanding of the world than ever before.”).

33. Herbert Hovenkamp, *Evolutionary Models in Jurisprudence*, 64 TEX. L. REV. 645, 653 (1985); *see also* ROBERT AXELROD & MICHAEL D. COHEN, HARNESSING COMPLEXITY: ORGANIZATIONAL IMPLICATIONS OF A SCIENTIFIC FRONTIER 29 (1999) (explaining that Darwin’s theory of biological evolution, read in conjunction with Adam Smith’s theory of decentralized markets, illuminates how “economic, social, and political processes actually function and change”); STEPHEN JAY GOULD, THE PANDA’S THUMB: MORE REFLECTIONS IN NATURAL HISTORY 66 (1980) (“I believe that the theory of natural selection should be viewed as an extended analogy—whether conscious or unconscious on Darwin’s part I do not know—to the laissez-faire economics of Adam Smith.”).

34. *See, e.g.*, WILSON, *supra* note 1, at 8–14 (describing consilience—the unity of knowledge derived from a synthesis of different sciences—as an interdisciplinary tool that can increase diversity and depth of knowledge through an underlying cohesion).

35. David Brooks, Op-Ed., *The Return of History*, N.Y. TIMES, Mar. 26, 2010, at A27. In an earlier Op-Ed piece, Brooks noted, “The hard sciences are interpenetrating the social sciences.”

“Given that human action comprises events of physical causation, why should the social sciences and humanities be impervious to consilience with the natural sciences? And how can they fail to benefit from that alliance?”³⁶ These calls have generated scores of excellent interdisciplinary papers seeking to meld evolutionary biology, ethics, complexity science, and economics.³⁷

Despite these noble efforts, “a substantial gulf remains between the social and the natural sciences, not necessarily because scholars don’t wish to sail across it, but because they don’t know how.”³⁸ This article seeks to partially bridge that gulf in the field of antitrust. Before attempting this journey, however, it is important to be mindful of the distinction between objective science and “values-driven economic conclusions.”³⁹

David Brooks, Op-Ed., *The Young and the Neuro*, N.Y. TIMES, Oct. 13, 2009, at A31.

36. WILSON, *supra* note 1, at 11. Wilson further argues, “[T]he brain sciences and evolutionary biology [are] the disciplines best poised to serve as bridges to the social sciences and humanities.” *Id.* at 291. Wilson adds, “We are drowning in information while starving for wisdom. The world henceforth will be run by synthesizers, people able to put together the right information at the right time, think critically about it, and make important choices wisely.” *Id.* at 294.

37. See, e.g., Phil Evans, *Repositioning Competition Policy*, 8 CONSUMER POL’Y REV. 169, 169 (1998) (recommending “a merger of behavioral and competition economics” for better antitrust enforcement); Shelby D. Hunt & Dennis B. Arnett, *Competition as an Evolutionary Process and Antitrust Policy*, J. PUB. POL’Y & MARKETING 15, 15 (2001) (positing a “process view of competition that draws heavily on evolutionary and Austrian economics” as an alternative to “principles derived from equilibrium-based economics”); C. Mantzavinos, *The Institutional-Evolutionary Antitrust Model*, 22 EUR. J. ECON. 273, 273 (2006) (seeking to apply an “analysis of competition as an evolutionary process” to “provide an alternative antitrust model to the mainstream model”); Mark J. Roe, *Chaos and Evolution in Law and Economics*, 109 HARV. L. REV. 641, 641 (1996) (seeking to “refine the classical evolutionary model from law and economics by modifying it to accommodate three related concepts—one from chaos theory, another of path dependence, and a final one from evolutionary theory”); Oliver Budzinski, *An Evolutionary Theory of Competition* 4 (Feb. 2004) (working paper), available at <http://ssrn.com/abstract=534862> (“[F]rom an evolutionary perspective, competitive market processes are permanently evolving . . . and principally open in results.”).

38. VERMEIJ, *supra* note 9, at 43. It also seems safe to say that “most economists remain skeptical about the applicability of Darwin’s ideas to the economic sphere.” Ferguson, *supra* note 29. Indeed, Nobel Prize-winning economist Paul Krugman described Michael Rothschild’s 1990 book, *Bionomics: Economy as Ecosystem*, as “biobabble.” Paul Krugman, Op-Ed., SLATE (Oct. 24, 1997, 3:30 AM), <http://www.slate.com/id/1925/>.

39. Horton, *supra* note 2, at 196; see also ROGER LEWIN, BONES OF CONTENTION: CONTROVERSIES IN THE SEARCH FOR HUMAN ORIGINS 18–19 (1987) (“[A] completely unbiased, unprejudiced exploration of nature is a methodological impossibility. . . . Without a set of expectations to act as a guide, such a search would be a chaotic and largely unprofitable enterprise. . . . Preconceptions are rarely acknowledged, because this, after all, would be ‘unscientific.’ And yet preconceptions are an individual scientist’s guide to how to view the world with a degree of order that allows structured questions to be asked.”); Jacobs, *supra* note 6, at 265 (“Choosing between economic theories is as much an act of politics as of science.”); William H. Page, *The Chicago School and the Evolution of Antitrust: Characterization, Antitrust*

Chicagoans and their predecessors have a long history of trying to “make ‘survival of the fittest’ in economic markets a [close] analogy to the struggle for survival in the biological world.”⁴⁰ “Social Darwinism,”⁴¹ as it has come to be known, “came in many forms; but usually it involved a simple move of Darwinian struggle and selection from the world of biology to the human social realm.”⁴² For conservatives, it was “an easy transition from the biological mechanism to a socioeconomic social policy of laissez-faire, where there is struggle and competition, and the weakest go to the wall.”⁴³ The laissez-faire philosophy that Social Darwinism generated “appealed to the successful businessmen of the [late nineteenth and early twentieth centuries], who found, within it, justification of their beliefs and practices.”⁴⁴ For

Injury, and Evidentiary Sufficiency, 75 VA. L. REV. 1221, 1227 n.34 (1989) (noting that Fox, *supra* note 6, at 579–81 “argu[es] not only that models employed by the Chicago School are ideologically slanted, but that all models necessitate the making of certain assumptions and that the acceptance by courts of models with the assumptions they incorporate is inappropriate, especially when the underlying assumptions are controversial”).

40. Hovenkamp, *supra* note 33, at 683.

41. As noted by historian Sean Dennis Cashman:

However, a new philosophy, Social Darwinism, justified the robber barons and their methods. The leading proponent of Social Darwinism was an English journalist, Herbert Spencer. As early as 1850, nine years before Charles Darwin published his revolutionary theory of evolution, Spencer’s *Social Statics* propounded an extreme form of laissez-faire economics akin to monetarism. The appearance of Darwin’s *The Origin of Species* in 1859 strengthened Spencer’s case. It was Spencer who in two articles of 1852 first coined the phrase “survival of the fittest,” which Darwin later used to describe the mechanism that propelled evolution. Spencer’s *Social Statics* mixed laissez-faire economics and biology. Its premise was that the pressure of subsistence on the human race had had a beneficent effect. It had led to social progress by putting a premium on intelligence, self-control, and skill. Spencer opposed state aid to the poor, whom he regarded as unfit and candidates for elimination. By the same token, he disapproved of tariffs to aid agriculture or industry, state banking, and governmental postal services.

It is hardly surprising that the robber barons found Social Darwinism congenial. They were being told what they wanted to hear—how a political system that claimed all men were equal could also encompass economic inequality. Moreover, the new philosophy denied any need for social reform.

SEAN DENNIS CASHMAN, *AMERICA IN THE GILDED AGE: FROM THE DEATH OF LINCOLN TO THE RISE OF THEODORE ROOSEVELT* 42 (3d ed. 1993).

42. Michael Ruse, *The Significance of Evolution*, in *A COMPANION TO ETHICS* 500, 500 (Peter Singer ed., 1991).

43. Michael Ruse, *The History of Evolutionary Thought*, in *EVOLUTION: THE FIRST FOUR BILLION YEARS*, *supra* note 3, at 1, 29.

44. Ruse, *supra* note 42, at 500–01. As stated by the conservative sociologist William Graham Sumner: “Let it be understood that we cannot go outside of this alternative: liberty, inequality, survival of the fittest: not-liberty, equality, survival of the unfittest. The former carries society forward and favors all of its best members: the latter carries society downwards and favors all its worst members.” WILLIAM G. SUMNER, *THE CHALLENGE OF FACTS AND OTHER ESSAYS* 25 (1914).

example, borrowing from Herbert Spencer,⁴⁵ Andrew Carnegie wrote in his essay *The Gospel of Wealth*:

The price which society pays for the law of competition . . . is also great . . . [;] and while the law may be hard for the individual, it is best for the race, because it insures the survival of the fittest in every department. We accept and welcome therefore, as conditions to which we must accommodate ourselves, great inequality of environment, the concentration of business, industrial and commercial, in the hands of a few, and the law of competition between these, as not only being beneficial, but essential for the future progress of the race.⁴⁶

Similarly, John D. Rockefeller claimed in his 1909 memoirs that his business success resulted solely from “the natural law of trade development.”⁴⁷

More recently, Chicagoans have employed Social Darwinian biological analogies to tout the alleged pro-competitiveness of monopolies and predatory conduct.⁴⁸ These efforts ironically were

45. DAVID NASAW, ANDREW CARNEGIE 343 (2006). Nasaw observes that to Carnegie, “[l]arger evolutionary laws governed the workings of the domestic economy. . . . The proper role of government was to remain on the sideline and let the laws work their magic.” *Id.* at 343–44; see also ERIC FONER, THE STORY OF AMERICAN FREEDOM 119–23 (1998) (“[S]ocial theorists in the Gilded Age called upon science to explain the success and failure of individuals and social classes. Analogies to the natural world pervaded the era’s thinking. The growing use of language borrowed from Charles Darwin (often by way of the British social philosopher Herbert Spencer), such as ‘natural selection,’ ‘the struggle for existence,’ and ‘the survival of the fittest,’ became part and parcel of the laissez-faire era’s outlook. In the hands of Spencer and his American disciples, what came to be called Social Darwinism offered a powerful critique of all forms of state interference with the ‘natural’ workings of society.”).

46. Andrew Carnegie, *The Gospel of Wealth*, reprinted in PHILOSOPHY AFTER DARWIN: CLASSIC AND CONTEMPORARY READINGS, *supra* note 30, at 122, 123. As to industrial concentration, Carnegie “did not think ‘bigness’ was bad; on the contrary, it was good for the economy, as it resulted in lower costs for consumers. The small manufacturer was a relic of the past.” NASAW, *supra* note 45, at 706.

47. NASAW, *supra* note 45, at 344. Likewise, “Jay Gould, asked in 1885 by a Senate investigating committee if he believed a ‘general national law was needed to regulate railroad rates,’ responded that they were already regulated by ‘the laws of supply and demand, production, and consumption.’” *Id.* For an excellent review of Rockefeller’s and Carnegie’s “ruthless determination to thwart [their] rivals by means fair or foul,” see CASHMAN, *supra* note 41, at 44–66.

48. See, e.g., Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1, 5 (1984) [hereinafter Easterbrook, *Limits of Antitrust*]; Frank H. Easterbrook, *When Is It Worthwhile to Use Courts to Search for Exclusionary Conduct?*, 2003 COLUM. BUS. L. REV. 345, 345–46 [hereinafter Easterbrook, *Exclusionary Conduct*]. Philosopher Peter Singer argues that liberal thinkers “in regard to Darwinian thinking” too readily “accept[ed] the idea that the Darwinian struggle for existence corresponds to the vision of nature suggested by Tennyson’s memorable (and pre-Darwinian) phrase, ‘nature red in tooth and claw.’” Singer adds, “Until the 1960s, evolutionary theorists themselves neglected the role that cooperation can play in improving an organism’s prospects of survival and reproductive success.” Peter Singer, *A Darwinian Left: Politics, Evolution, and Cooperation*, in PHILOSOPHY AFTER DARWIN: CLASSIC AND CONTEMPORARY READINGS, *supra* note 30, at 343, 343.

catalyzed by Harvard economist Joseph Schumpeter,⁴⁹ who argued that “in dealing with capitalism we are dealing with an evolutionary process.”⁵⁰ To Schumpeter, the “process of Creative Destruction is the essential fact about capitalism.”⁵¹ Since capitalism involved an “organic process” of “industrial mutation,” in a “perennial gale of creative destruction,” monopoly and the maximization of profits through “restrictive practices may do much to steady the ship and to alleviate temporary difficulties.”⁵² To Schumpeter, therefore, “policies that seem . . . predatory and restrictions of output” were part of the natural order of progress.⁵³

Schumpeter and Milton Friedman’s views of monopoly as “natural,” and therefore ultimately benign or positive, have been leveraged by conservative jurists to defend monopoly, concentration, and predatory business practices.⁵⁴ For example, in *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko*,⁵⁵ Justice Antonin Scalia defended monopoly pricing as “an important part of the free-market system,” which serves as an inducement to “attract[] ‘business acumen’ in the first place” and engage in “risk taking that produces innovation and economic growth.”⁵⁶ Similarly, Seventh Circuit Judge Frank

49. Joseph A. Schumpeter, *Capitalism and the Process of Creative Destruction*, in MONOPOLY POWER AND ECONOMIC PERFORMANCE: THE PROBLEM OF INDUSTRIAL CONCENTRATION, *supra* note 15, at 19.

50. *Id.* at 27.

51. *Id.* at 28.

52. *Id.* at 28–31.

53. *Id.* at 32–33. Following Schumpeter, Chicago School economist Milton Friedman has aggressively defended monopolies. *See, e.g.*, Milton Friedman, *Monopoly and the Social Responsibility of Business and Labor*, reprinted in MILTON FRIEDMAN, CAPITALISM AND FREEDOM: FORTIETH ANNIVERSARY EDITION 119, 120 (1962) (“It is easy to argue that [the monopolist] should discharge his power not solely to further his own interests but to further socially desirable ends. Yet the widespread application of such a doctrine would destroy a free society.”).

54. *See* DE WAAL, *supra* note 18, at 222 (observing that Greenspan and other supply-side economists believed that “even though the free market by itself is no moral enterprise, it would steer society toward a state in which everyone’s interests were optimally served”). In fairness to Schumpeter, it should be noted that he endorsed a dynamic conception of competition, which differed from the Chicagoans’ static price competition models. *See* TIMOTHY FERRIS, THE SCIENCE OF LIBERTY: DEMOCRACY, REASON AND THE LAWS OF NATURE 182–83 (2010) (“Associated with Milton Friedman and his colleagues at the University of Chicago, [the Chicago School] stresses classical free-market values combined with the use of empirical tools to analyze how markets work. Its adherents start from the standpoint of individual liberty, regarding free markets as both an embodiment of liberty and a source of financial strength.”); MICHAEL J. SANDEL, DEMOCRACY’S DISCONTENT: AMERICA IN SEARCH OF A PUBLIC PHILOSOPHY 308–09 (1996) (describing “the libertarian or laissez-faire conservatism of Barry Goldwater and Milton Friedman”).

55. 540 U.S. 398 (2004).

56. *Id.* at 407; *see also* Stucke, *supra* note 16, at 497–98 (describing the Supreme Court’s

Easterbrook has written: “Competition is a gale of creative destruction . . . and it is through the process of weeding out the weakest firms that the economy as a whole receives the greatest boost. Antitrust law and bankruptcy law go hand in hand.”⁵⁷ More recent attempts by Chicagoans to tie their conservative antitrust approaches to biological metaphors have emanated from scholars such as Harvard professor Marco Iansiti and Roy Levien,⁵⁸ and former Assistant Attorney General for Antitrust Thomas O. Barnett.⁵⁹

Not all scholars seeking to apply evolutionary biology principles have agreed with the Social Darwinists and Chicagoans. Professor Herbert Hovenkamp has observed, “Scholars have viewed the antitrust laws from two different Darwinian perspectives.”⁶⁰ Unlike the Social Darwinists, “liberal historians have seen antitrust laws as a Progressive Era attempt by Reform Darwinists to use social control to intervene in markets in which the natural selection process was producing a gross maldistribution of wealth.”⁶¹ Hovenkamp has aptly noted, “The difference between the Social Darwinists and the Reform Darwinists rested ultimately on questions not of science, however, but of political values.”⁶²

dicta in *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko*).

57. Easterbrook, *Exclusionary Conduct*, *supra* note 48, at 345–46.

58. See MARCO IANSITI & ROY LEVIEN, *THE KEYSTONE ADVANTAGE: WHAT THE DYNAMICS OF BUSINESS ECOSYSTEMS MEAN FOR STRATEGY, INNOVATION AND SUSTAINABILITY* 68, 223–24 (2004) (arguing that dominant business firms and monopolies should be shielded from antitrust regulations because they are analogous to keystone species in biological ecosystems). For a rebuttal to Iansiti and Levien, see Horton, *supra* note 2, at 196 (“*The Keystone Advantage*’s biological metaphor is facially compelling, but ultimately unsupported by sound biological principles or evidence.”).

59. Thomas O. Barnett, *Section 2 Remedies: What to Do After Catching the Tiger by the Tail*, 76 ANTITRUST L.J. 31, 31 (2009) (analogizing monopolists to “free-range tigers,” which “are generally good”). Barnett committed the same error as Iansiti and Levien of analogizing individual corporations to species. See Horton, *supra* note 2, at 207–08 (noting that dominant firms “cannot be analogized to biological species,” and that in biological ecosystems, “where competition occurs at all, it is generally more intense within species than between species”); *id.* (quoting EDWARD O. WILSON, *SOCIOBIOLOGY* 120 (abr. ed. 1980)).

60. Hovenkamp, *supra* note 33, at 683.

61. *Id.*

62. *Id.* at 685. Hovenkamp added, “Each of the influential evidentiary models in jurisprudence was closely tied to a particular political view about the role of the state in the allocation of scarce resources.” *Id.* Hovenkamp further explained that social Darwinists “were thoroughgoing economic determinists” who “believed that social science must merely describe the world, using Darwin’s economic theory of natural selection to discover the natural rules of resource allocation in human society, but remaining powerless to change these fundamental laws.” *Id.* at 654. Reform Darwinists, on the other hand,

believed that society, not nature, ought to decide how to distribute resources. Unlike the lower animals, people have the capacity for ‘social control’—to use the state to define property rights and to determine how wealth ought to be distributed. This belief

Like Professor Hovenkamp, other scholars have pointed to the influence of political values in the development of Chicagoans' economic positions. For example, this author has previously argued that Chicagoans' positions emanate from such shared "implied values as concentration (bigger is better), free market places (no government interference), and 'the survival of the fittest.'"⁶³ As similarly asserted by Professor William Page, "[T]he Chicago approach reflects the influence of the constrained vision, particularly in the presumption of self-interested, maximizing behavior, and the idea that wealth maximization is the unintended but predictable outcome of open markets."⁶⁴ More damningly, in the words of Harvard biologist Richard Lewontin:

Darwinism, born in ideological struggle, has never escaped from an intimate reciprocal relationship with worldviews exported from and imported into the science. No one challenges the claim that evolutionary theory has had a wide effect on social theory. It is a cliché of cultural history that the explanation of evolution by natural selection served as an ideological justification for laissez-faire competitive capitalism⁶⁵

Chicagoans' models ultimately rest on "the equilibrium models of neoclassical [economic] theory."⁶⁶ Unfortunately, these models fall short because they are "hermetic—that is, sealed off from the complexities of human behavior and the constraints imposed by the environment."⁶⁷ Notwithstanding the dangers of confusing science with implied values, as Chicagoans consistently have done, a flood of modern research in the field of evolutionary biology warrants a

drew the starkest line imaginable between the Social Darwinists and the Reform Darwinists, and explains the extraordinary differences in the legal theories that they developed. Both groups, however, were Darwinian evolutionists, and both developed evolutionary models of jurisprudence.

Id. at 655–56.

63. Horton, *supra* note 2, at 203.

64. Page, *supra* note 39, at 1300.

65. RICHARD LEWONTIN, IT AIN'T NECESSARILY SO: THE DREAM OF THE HUMAN GENOME AND OTHER ILLUSIONS 306 (2000); *see also* STIGLITZ, *supra* note 28, at 258–59 ("In a sense, views of values . . . are embedded in the very formation of [the Chicago School's] analyses. Many of the (what seem to be absurd) conclusions of this school's analyses come from these and other extreme simplifications in their models."); Eleanor M. Fox, *The Efficiency Paradox, in HOW THE CHICAGO SCHOOL OVERSHOT THE MARK*, *supra* note 26, at 77, 88 ("[B]y trusting dominant firm strategies and leading firm collaborations to produce efficiency, modern U.S. antitrust protects monopoly and oligopoly, suppresses innovative challenges, and stifles efficiency Antitrust enforcers and jurists [need to] appreciat[e] that conservative economic presumptions are commonly misaligned with the reality of markets").

66. WILSON, *supra* note 1, at 197.

67. *Id.*

revisiting of the questions of whether and how we can best apply the recent findings from this field to antitrust theory.

Parts III and IV of this article update these static models by applying the lessons from evolutionary biology to structural and behavioral antitrust issues.⁶⁸ In this effort, this article has benefited from a great deal of previous path-finding work.⁶⁹

III. APPLYING EVOLUTIONARY BIOLOGY TO STRUCTURAL ANTITRUST ISSUES SUCH AS CONCENTRATION AND MONOPOLIES

This part applies the lessons of evolutionary biology to structural antitrust issues. Section A first argues that monopolies and dominant firms threaten our economy because healthy ecosystems thrive on aggressive and unremitting competition at all levels,⁷⁰ which is sparked by a dazzling array of creative diversity,⁷¹ variation,⁷² and

68. See *infra* Part III (applying current principles of evolutionary biology to structural issues in antitrust such as concentration and monopolies); *infra* Part IV (discussing competitive behavior from an evolutionary biology perspective).

69. See, e.g., *supra* notes 2–14, 16–22 (citing the works of numerous scholars that address evolutionary biology, economics, and antitrust law). In addition to the visionary efforts of Gregory Gundlach, Bert Foer, and the American Antitrust Institute, the author wishes to specially acknowledge the assiduous efforts of Paul J. Zak, Michael C. Jensen, and the Gruter Institute for Law and Behavioral Research. See MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY, *supra* note 19, as well as Michael Ruse, Edward O. Wilson, and the numerous contributors to PHILOSOPHY AFTER DARWIN: CLASSIC AND CONTEMPORARY READINGS, *supra* note 30, and Stucke, *supra* note 17, for their groundbreaking work in applying behavioral economics research to antitrust.

70. See, e.g., ELLIOTT SOBER, THE NATURE OF SELECTION: EVOLUTIONARY THEORY IN PHILOSOPHICAL FOCUS 359, 368 (1984) (“[S]pecies selection is a very different sort of evolutionary mechanism from individual selection Evolutionary theory now deploys a striking hierarchy of possible selection mechanisms.”); VERMEIJ, *supra* note 9, at 18–19 (“[E]very individual of every population is likely to compete for each of several resources during its lifetime . . . [for] competition is a ubiquitous phenomenon that lies at the heart of economic life.”); EDWARD O. WILSON, THE DIVERSITY OF LIFE 172–80 (1992) (discussing the competitive forces that increase biodiversity); WILSON, *supra* note 59, at 119–21 (discussing both intraspecific (between “two or more individuals of the same species”) and interspecific (between “members of two or more species”) competition).

71. See, e.g., STEPHEN JAY GOULD, FULL HOUSE: THE SPREAD OF EXCELLENCE FROM PLATO TO DARWIN 65 (1996) (“[M]ore than 99 percent of all species that ever lived are now extinct”); JONATHAN WEINER, THE BEAK OF THE FINCH 134 (1994) (“All told there are somewhere between two million and thirty million species of animals and plants alive on the planet today. Something like a thousand times that many species—about two billion, by the most conservative guess—have evolved, struggled, flourished and gone extinct since the first shelly fossils were laid down in the Cambrian explosion, about 540 million years ago.”); Adam Frank, *The Day Before Genesis*, in THE BEST AMERICAN SCIENCE AND NATURE WRITING 2009, at 66, 66 (Elizabeth Kolbert ed., 2009) (“[O]ur universe generates and regenerates itself in an endless cycle of creation.”).

72. VERMEIJ, *supra* note 9, at 22 (“The variation introduced by imprecision in copying and by environmental influences provides the foundation for additional processes—selection, evolution,

multiplicity.⁷³ Section B then addresses the issue of monopolies and economic efficiency from an evolutionary biology perspective, and shows that nature is consistent in building structural and functional redundancies into its complex ecosystems,⁷⁴ which enhance long-term adaptability and variability as exogenous or endogenous environmental conditions change.⁷⁵ Thus, diversity, variability, and opportunity are the keys not only to long-term species survival, but to the stability and overall health of a thriving ecosystem. Finally, Section C argues that monopolies and oligopolies are not the inevitable results of competition in a “survival of the fittest” ecosystem.⁷⁶ Instead, they are artificially

and adaptation—that characterize organized systems in general and economic systems in particular. Variant entities differ not merely in composition—in the sequences of genetic material, or the pool of species in ecosystems and entire geographic regions—but also in performance.”).

73. See, e.g., GOULD, *supra* note 71, at 229–30 (“In a society driven, often unconsciously, to impose a uniform mediocrity upon a former richness of excellences—where McDonald’s drives out the local diner and the mega-Stop & Shop eliminates the corner Mom and Pop—an understanding and defense of full ranges as natural reality might help to stem the tide and preserve the rich raw material of any evolving system: variation itself.”); *id.* at 230 (noting that Darwin concluded his “revolutionary book” by observing, “Whilst this planet has gone cycling on according to the Fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.” (citing CHARLES DARWIN, *ON THE ORIGIN OF SPECIES* (1859))); Bryan Norton, *Commodity, Amenity, and Morality: The Limits of Quantification in Valuing Biodiversity*, in *BIODIVERSITY* 200, 203 (Edward O. Wilson ed., 1988) (“The value of biological diversity is more than the sum of its parts.”).

74. See, e.g., VERMEIJ, *supra* note 9, at 139 (“The power of organization derives from five overlapping advantages: (1) greater redundancy, meaning that the system becomes more forgiving of error and disruption, and that variants arising within the system are not automatically crippling to it; . . . [and] (3) increased generation and testing of variation, making the ‘search’ and selection for adaptations faster and more directed”); Vermeij, *supra* note 16, at 128 (“Biological systems for billions of years have been characterized by redundancy, which spreads risks and enables systems of loosely linked but still interdependent parts to absorb and recover from shocks. . . . Redundancy may be at odds with economic efficiency, but in the long run it is better to have a safety net of redundant production than to be efficient and dead.”).

75. See, e.g., Vermeij, *supra* note 16, at 121–22 (“In short, biological and economic systems have evolved toward an organizational structure that encompasses, tolerates, generates, and accumulates variation. . . . Not only do systems with such a structure permit innovations to arise and to be incorporated, but they become robust in the face of many externally or internally imposed shocks. . . . The most robust ecosystems can tolerate and incorporate new species and adjust to the disappearance of others.”).

76. It was actually the philosopher Herbert Spencer, and not Charles Darwin, who coined the phrase “survival of the fittest.” PETER A. CORNING, *HOLISTIC DARWINISM: SYNERGY, CYBERNETICS, AND THE BIOECONOMICS OF EVOLUTION* 385 (2005); see also *supra* text accompanying note 41 (discussing Herbert Spencer and Social Darwinism). Ironically, most neo-conservatives seizing upon Spencer’s phrase to justify unfettered deregulation of markets fail to appreciate that Spencer was “a pacifist who abhorred war and held a dualistic view.” CORNING, *supra*, at 385. Indeed,

Spencer’s “science of ethics,” which provided a foundation for what has become known as evolutionary ethics, was derived from his vision of society . . . the “science of right living” as he called it consisted of an application of the scientific method to the problem of determining which ethical principles and moral precepts would be best able

created and maintained organizations⁷⁷ that have no true natural analogs in an open competitive evolutionary ecosystem.⁷⁸ Furthermore, monopolies and dominant firms erode and destroy the communal values of reciprocity and trust that underlie the efficiency of our capitalistic free-market economy.

A. Competition, Diversity, and Monopoly

In 1949, Edward H. Levi, then Provost of the University of Chicago, wrote, “The general impression of the public is that monopoly is

to harmonize a given society at its particular stage of evolution. The criteria for evaluating ethical issues should be their consequences both for the superorganism and its members, recognizing their interdependence

Id. at 385–86.

77. Both Thomas Jefferson and Abraham Lincoln expressed grave concerns and issued prescient warnings about the rising potential for artificially maintained and protected corporate power. For example, in 1816, Thomas Jefferson warned, “I hope we shall crush in its birth the aristocracy of our monied corporations which dare already to challenge our government to a trial of strength, and bid defiance to the laws of our country.” Letter from Thomas Jefferson to Tom Logan (Nov. 1816), *quoted in* TED NACE, *GANGS OF AMERICA: THE RISE OF CORPORATE POWER AND THE DISABLING OF DEMOCRACY* 46 (2003). Similarly, in 1864, during the height of the Civil War, Abraham Lincoln wrote in a letter:

We may congratulate ourselves that this cruel war is nearing its end. It has cost a vast amount of treasure and blood. . . . It has indeed been a trying hour for the Republic; but I see in the near future a crisis approaching that unnerves me and causes me to tremble for the safety of my country. As a result of the war, corporations have been enthroned and an era of corruption in high places will follow, and the money power of the country will endeavor to prolong its reign by working upon the prejudices of the people until all wealth is aggregated in a few hands and the Republic is destroyed. I feel at this moment more anxiety for the safety of my country than ever before, even in the midst of war. God grant that my suspicions may prove groundless.

Letter from Abraham Lincoln to Col. William F. Elkins (Nov. 21, 1864), *quoted in* NACE, *supra*, at 14–15. For an excellent discussion of the Roberts Court’s current activist judicial efforts to protect monopolies, see Stucke, *supra* note 16, at 498–504 (examining the shifting responses of the Court to monopolies).

78. See, e.g., LOUIS D. BRANDEIS, *Shall we Abandon the Policy of Competition?*, in *THE CURSE OF BIGNESS: MISCELLANEOUS PAPERS OF LOUIS D. BRANDEIS* 104, 105 (Osmond K. Fraenkel ed., 1934) (“There are no natural monopolies today in the industrial world.”); VERMEIJ, *supra* note 9, at 302 (“The greater vulnerability of monopolistic or other very powerful entities seems to rest on the exploitation rather than the enhancement of their resource base, that is, on the erosion of feedbacks that promote the larger common good. Local monopolies, such as trees poisoning their neighbors and ants annihilating most other insects in their vicinity are rare and short-lived in nature.”); Horton, *supra* note 2, at 205–13 (arguing that economic monopolies or dominant firms are not analogous to biological species); E. G. Leigh, Jr. et al., *What Do Human Economies, Large Islands and Forest Fragments Reveal About the Factors Limiting Ecosystem Evolution?*, 22 *J. EVOLUTIONARY BIOLOGY* 1, 2 (2009) (“In natural ecosystems, competition quickly breaks down most monopolies that ‘distort the market’ by defending poorly used resources: poorly used resources soon find better users.”); Leigh & Vermeij, *supra* note 3, at 714 (“Thanks to the relative freedom of natural ecosystems from monopolies competition tends to increase their productivity and diversity.”).

inevitable, and since it is inevitable, it is silly to try to prevent it.”⁷⁹ Chicagoans from Milton Friedman to Justice Scalia have consistently accepted Levi’s position, and even argued that monopolies are a positive outcome of free-market competition.⁸⁰ Seeking to apply evolutionary biology metaphors to such thinking, Professors Iansiti and Levien have argued, for example, that “[s]ociety would suffer deeply if [] organizations [such as Microsoft, Wal-Mart, Li & Fung, and eBay] stopped playing their respective roles (or if competition or regulation somehow prevented them from doing so).”⁸¹ These commentators hoped that analogizing particular monopolies and dominant businesses to keystone species would “spur a new look at antitrust economics, balancing the potential threat of monopolistic behavior with the value that can be created by an effective keystone strategy.”⁸² Evolutionary biology as applied to economics and structural antitrust issues, however, rebuts the arguments based on the keystone strategy.

In natural ecosystems, intense competition sets very high bars for long-term success at all levels. Substantial and sustained competition at the interspecific and intraspecific species levels are therefore hallmarks of natural evolutionary systems.⁸³ Since natural selection operates at

79. *The Effectiveness of the Federal Antitrust Laws: A Symposium*, 39 AM. ECON. REV. 689, 703 (1949), reprinted in Thurman Arnold et al., *The Effectiveness of the Antitrust Laws*, in MONOPOLY POWER AND ECONOMIC PERFORMANCE: THE PROBLEM OF INDUSTRIAL CONCENTRATION, *supra* note 15, at 151, 158. Levi added: “A variation of this is the popular opinion that it is childish to be against monopoly (perhaps because it is inevitable) and that, therefore, a monopoly cannot be said to be ‘bad’ or a violation.” *Id.* Edward S. Mason opined,

Until it is clearer to me than it is now (a) that the large firm in the presence of manifestly dynamic influences exerts an adverse monopolistic influence on the functioning of the economy and (b) that any possible action under existing (or a modified) antitrust policy would remedy the situation, I have my fingers crossed.

The Effectiveness of the Federal Antitrust Laws: A Symposium, *supra*, at 713, reprinted in Arnold et al., *supra*, at 161.

80. See, e.g., *Verizon Commc’ns, Inc. v. Law Offices of Curtis V. Trinko*, 540 U.S. 398, 407 (2004) (defending monopoly pricing as “an important part of the free-market system”); FRIEDMAN, *supra* note 53, at 122–23 (arguing that larger enterprises are a natural result of a growing economy).

81. IANSITI & LEVIEN, *supra* note 58, at 223.

82. *Id.* at 223–24.

83. See BERT HÖLLDOBLER & EDWARD O. WILSON, *THE ANTS* 309–400, 419 (1990) (“The most obvious type of effective species interaction is competition.”); WILSON, *supra* note 59, at 119–21 (discussing intraspecific and interspecific competition); see also VERMEIJ, *supra* note 9, at 29 (“[W]hen competition is intense and the stakes are high, as measured by absolute costs and benefits, the bar of acceptable performance is set very high, and success demands a close approximation to the ideal.”); *id.* at 170 (“[E]conomic spatial divisions of the world, whether they be forests and fields of nature or the nations of human civilization, result from competition and the responses of living things to it.”).

multiple levels,⁸⁴ “[m]ultilevel selection is clearly important for understanding many adaptations in diverse systems.”⁸⁵ Ultimately, “natural selection is a statistical filtering process”⁸⁶ that “requires that we simultaneously consider [competitive evolutionary] effects at all different levels of complexity.”⁸⁷

“Competition drives diversification.”⁸⁸ Intense head-to-head competition in natural ecosystems results in “the diversification of closely related species occupying the same locality.”⁸⁹ Such diversification, in turn, leads to increases in overall diversity, which leads to increased ecosystem and organism adaptability, resilience, and stability.⁹⁰ “Recent experimental studies on whole ecosystems support what ecologists have long suspected: The more species that live in an ecosystem, the higher its productivity and the greater its ability to withstand drought and other kinds of environmental stress.”⁹¹ For example, both terrestrial and aquatic ecosystems require high levels of species diversity for their long-term health and stability.⁹² On the other hand, ecosystems with a “relative lack of diversity” and variability are inherently unstable and subject to invasion by species from outside the ecosystem.⁹³

84. See WILSON, *supra* note 70, at 88 (“[T]here are two basic levels in the diversity of life: genetic variation within species and differences among species.”).

85. Joseph Travis & David N. Reznick, *Adaptation*, in EVOLUTION: THE FIRST FOUR BILLION YEARS, *supra* note 3, at 126, 129.

86. *Id.* at 106.

87. Laubichler & Maienschein, *supra* note 3, at 338.

88. Leigh et al., *supra* note 78, at 3 (“[T]he role of competition in promoting diversification has been demonstrated most clearly in island ecosystems.”); see also STEPHEN JAY GOULD, EIGHT LITTLE PIGGIES: REFLECTIONS IN NATURAL HISTORY 323 (1993) (“[D]iversity, measured as number of species, has increased through time . . .”).

89. HÖLLDOBLER & WILSON, *supra* note 83, at 395.

90. See IANSITI & LEVIEN, *supra* note 58, at 70 (“Diversity in ecosystems often directly enhances stability by ensuring that the ecosystem has the capacity (in terms of genetic and behavioral variation) to respond to environmental changes.”); James E. Lovelock, *The Earth as a Living Organism*, in BIODIVERSITY, *supra* note 73, at 486, 488 (“[N]ew ecological models demonstrate that as diversity increases so does stability and resilience.”).

91. WILSON, *supra* note 1, at 294.

92. Ruth Patrick, *Biodiversity: Why Is It Important?*, in BIODIVERSITY II: UNDERSTANDING AND PROTECTING OUR BIOLOGICAL RESOURCES 15, 17 (Marjorie L. Reaka-Kudla et al. eds., 1997) (“[I]t is easy to understand that terrestrial ecosystems are dependent on a high diversity of macro- and microscopic organisms if the functioning of the ecosystem is to be efficient [Similarly,] [i]n the aquatic world, biodiversity is very important in maintaining the purity of the water for multiple uses . . .”).

93. Peter M. Vitousek, *Diversity and Biological Invasions of Oceanic Islands*, in BIODIVERSITY, *supra* note 73, at 181, 184 (discussing why isolated island species are more susceptible to extinction caused by biological invasions).

Human economies mimic nature by requiring high levels of diversity for long-term growth and success. “As in human economies, competition among individuals, coalitions of cooperating individuals, and species, for resources needed to survive and reproduce has driven an increase of productivity, diversity and intensity of competition in the world’s ecosystems over evolutionary time.”⁹⁴ Also, similar to “human economies, where the specialization involved in division of labour allows great increases in efficiency [], the specialization resulting from adaptive divergence leads to [a] more thorough exploitation of resources.”⁹⁵ In Professor Vermeij’s words:

Increasing productivity through the harnessing and regulation of supply therefore spreads through an increasingly diverse economy, creating opportunity for old and new entities. . . . To economists, this kind of feedback translates into the more efficient allocation of resources among competing entities, an allocation not achievable in a monopoly or in a system of inflexible top-down control⁹⁶

Therefore, it should not surprise us to find a positive correlation between economic diversity and overall economic growth.⁹⁷

94. Leigh et al., *supra* note 78, at 2.

95. *Id.* (citing ADAM SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS (1776)).

96. VERMEIJ, *supra* note 9, at 256. Professor Vermeij adds:

It is this kind of feedback that creates forests, in which consumers and producers enhance one another’s prospects in spite of competition among them, and in which trees of one species often improve the soil not just for themselves but for their neighbors. Productivity and diversity beget themselves and each other, together creating a stable, relatively flexible, somewhat disturbance resistant, diversified economy

Id.; see also Richard K. Bambach, *Supporting Predators: Changes in the Global Ecosystem Inferred from Changes in Predator Diversity*, 8 PALEONTOLOGICAL SOC’Y PAPERS 319, 319 (2002) (“Predators have never been numerically abundant compared to prey, . . . [but] the diversity of predators and the proportion of total fauna diversity composed of predators have both increased over time, implying that ecosystems have increased their ability to support either more predators or more specialization among predators.”).

97. STUART A. KAUFFMAN, REINVENTING THE SACRED: A NEW VIEW OF SCIENCE, REASON, AND RELIGION 151 (2008) (“[A]s data confirm—economic growth is positively correlated with economic diversity.”). Kauffman adds:

[I]t is surely true that there is an economic web, . . . [and] the structure of the web, the ways it affords new economic niches, and the high probability that its diversity is positively correlated with its growth may have the most profound implications for our understanding of economic growth at all levels.

Id. at 176. He further observes, “Both anecdotes and good economic data support the rough idea that the diversity of goods and services in an economy drives its growth.” *Id.* at 160; see also VERMEIJ, *supra* note 9, at 30 (“[D]iversity is an inescapable and universal attribute of economic systems, an attribute that on average builds on itself as economies develop.”). Chicagoans also neglect to factor in the lost “opportunity costs” from diminished diversity. See John S. Rosenberg, *Of Ants and Earth: E.O. Wilson’s View of Life Takes in All Things Small and Great*,

B. Evolutionary Biology, Complexity Science, and Efficiency

Chicagoans generally favor consolidation and concentration⁹⁸ because these actions allegedly can create economic efficiencies by reducing supposedly inefficient economic redundancies and overlaps.⁹⁹ Yet, nature and evolution consistently build seemingly inefficient structural, physiological, and chemical¹⁰⁰ redundancies into living systems at all levels as a means of ensuring increased flexibility, adaptability, and stability.¹⁰¹ As an example, “many of the changes” in genetic regulatory controls “seem to have their origin in repetitive sequences of junk DNA.”¹⁰² A simple evolutionary reason for

HARV. MAG., Mar.–Apr. 2003, at 37, 38 (noting reduction in habitat and population size increase the vulnerability of remaining species and can deprive society of scientific discoveries).

98. In all fairness, we must exclude Seventh Circuit Judge Richard Posner from this characterization based upon his inspired trilogy of merger opinions. *See* *United States v. Rockford Mem'l Corp.*, 898 F.2d 1278, 1280–86 (7th Cir. 1990) (holding the merger of the two largest, non-profit hospitals in Rockford, Illinois violated Section 7 of the Clayton Act); *FTC v. Elders Grain, Inc.*, 868 F.2d 901, 902–08 (7th Cir. 1990) (preventing the second largest manufacturer of industrial dry corn in the United States from acquiring the fifth largest manufacturer, thereby occupying 32% of the dry corn market); *Hosp. Corp. of Am. v. FTC*, 807 F.2d 1381, 1383–93 (7th Cir. 1986) (holding the acquisition of two hospitals by the largest proprietary chain of hospitals in the United States violated Section 7 of the Clayton Act); *see also In re High Fructose Corn Syrup Antitrust Litig.*, 295 F.3d 651, 653–66 (7th Cir. 2002) (reversing the District Court’s grant of summary judgment to producers of high fructose corn syrup on charges of price fixing, in violation of the Sherman Act).

99. *See* Peter C. Carstensen, *How to Assess the Impact of Antitrust on the American Economy: Examining History or Theorizing?*, 74 IOWA L. REV. 1175, 1175 (1989) (“Those ‘nattering nabobs of negativism’ Judges Easterbrook and Posner, and former Judge Bork, advance the broad claim that traditional antitrust law has imposed serious efficiency costs on the American economy.”); Harold Demsetz, *Dialogue*, in *INDUSTRIAL CONCENTRATION: THE NEW LEARNING* 233, 235–36 (Harvey J. Goldschmid et al. eds., 1974) (advocating the repeal of antitrust law “as it is presently being carried out” in order to allow “efficiency mergers”).

100. *See* VERMEIJ, *supra* note 9, at 30 (“Diversity within organisms is expressed in cell types, tissues, and organs; and within cells, diversity is seen among organelles and among macromolecules.”); *id.* at 139 (discussing how in genomes, redundancies help ensure that an “error will not jeopardize the entire genome or the body that the genome specifies. . . . Redundancy as multiple copies, each subject to subsequent variation, ensures that variants are generated without disastrous consequences for their bearer.”); *see also* JOHN H. HOLLAND, *HIDDEN ORDER: HOW ADAPTATION BUILDS COMPLEXITY* 89 (1995) (describing how complex adaptive information-processing systems such as the genome “automatically describe novel situations in terms of familiar components; internal models, in the form of default hierarchies, form naturally”).

101. *See* Joseph Farrell, *Complexity, Diversity, and Antitrust*, 51 ANTITRUST BULL. 165, 167–68 (2006) (“[H]aving multiple organizations helps ensure that multiple approaches will be seriously pursued. If so, then that’s a biodiversity benefit of competition in the old-fashioned sense of many players and perhaps even low concentration.”); *supra* notes 83–87 and accompanying text (discussing the importance of diversity in natural ecosystems).

102. Courtney Humphries, *Treasure in the Genome’s Trash*, HARV. MAG., May–June 2008, at 11, 12. The leader of the Mammalian Genome Project, Kirsten Lindblad-Toh, “explains that just 5 percent of the DNA in mammalian genomes is thought to be functional, and of that fraction,

redundancies is that if “only one body part engages in a given task, the loss or injury of that part could compromise the whole.”¹⁰³ Moreover, in complex and adaptive systems, redundancies and less densely connected interdependencies are crucial to avoiding “complexity catastrophes” throughout the system,¹⁰⁴ like those of the recent banking and financial crisis.¹⁰⁵

Chicagoans also frequently argue that dominant firms and monopolies have achieved their superior economic status by being more economically efficient.¹⁰⁶ “Free markets, the neo-Darwinists assure us, will . . . generate a socially optimal mix of goods and services, produced in the most efficient manner, by optimally sized firms operating in optimally structured markets.”¹⁰⁷ Indeed, the “Law and Economics literature often contains an explicit evolutionary assumption that whatever survives represents fitness in some sense and that there is therefore over time an ‘evolution toward efficiency.’”¹⁰⁸ As economists Walter Adams and James W. Brock observe, “The mere existence of

less than half actually serves as a blueprint to make proteins.” *Id.* at 11.

103. VERMEIJ, *supra* note 9, at 139. Environmental scientist G. Carleton Ray admits that the immense diversity of life seems simply redundant to many . . . and we might have to admit that some species may indeed be redundant. But when asked to identify such redundancies, we may react like the young Mozart when told by Emperor Josef II that his sonata contained too many notes. He replied that it contained “exactly the necessary number.”

G. Carleton Ray, *Ecological Diversity in Coastal Zones and Oceans*, in BIODIVERSITY, *supra* note 73, at 36, 44–45.

104. See BEINHOCKER, *supra* note 5, at 150–52 (noting that as a network becomes increasingly interconnected, changes in one area of the network will necessarily produce changes in other areas); IANSITI & LEVIEN, *supra* note 58, at 68 (“Removal of biological keystones can have dramatic cascading effects throughout the entire ecosystem”); *id.* at 20 (“Each member of the ecosystem depends to some degree on the presence of every other for the simple reason that they are adapted to each other’s presence.”); see also BEINHOCKER, *supra* note 5, at 154 (“Some biologists, such as Stuart Kauffman, believe that this tension [between interdependencies and adaptability] creates upper limits on the complexity of organisms.” (citing STUART KAUFFMAN, *THE ORIGINS OF ORDER* 209–18 (1993))).

105. See *‘Too Big to Fail?’: The Role of Antitrust Law in Government-Funded Consolidation in the Banking Industry: Hearing Before the H. Comm. On the Judiciary*, 111th Cong. 7 (2009) (statement of Albert A. Foer, President, American Antitrust Institute) (“The ‘too big to fail’ problems relate to . . . creation of large organizations that are so deeply embedded in the economy that their failure is likely to have ripple effects which, cumulatively, are just not acceptable to the polity”).

106. See, e.g., ROBERT H. BORK, *THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF* 178 (1978) (“Antitrust should not interfere with any firm size created by internal growth, and this is true whether the result is monopoly or oligopoly.”).

107. ADAMS & BROCK, *supra* note 15, at 301 (discussing the neo-Darwinist vision).

108. FUKUYAMA, *supra* note 21, at 219; see also Spencer Weber Waller, *The Law and Economics Virus*, 31 CARDOZO L. REV. 367, 367 (2009) (“In its strongest form, the Chicago School version of Law and Economics argues that Justice is Efficiency.”).

corporate giantism is assumed as proof that bigness has been attained solely because of superior economic performance.”¹⁰⁹

To meaningfully discuss this issue, we must first ask, as antitrust scholar Eleanor Fox has asked, “What is efficiency?”¹¹⁰ In a natural healthy ecosystem, efficiency can include long-term stability, adaptability, and diversity generated by dynamic evolutionary competition. Similarly, on the issue of “whether evolutionary forces will select the most efficient norms . . . the game theory literature displays an unusual uniformity. The consensus is that survival of the ‘fittest’ is not the same as survival of the efficient.”¹¹¹ As Eric D. Beinhocker states: “Examined through the lens of Complexity Economics, . . . asking whether markets are efficient makes about as much sense as asking whether the ecosystem of the Amazon rain forest is efficient. Efficient compared to what?”¹¹²

Adams and Brock argue that from an economic perspective, “neo-Darwinism is concerned primarily with static, managerial efficiency rather than with dynamic social efficiency.”¹¹³ Similarly, Professor Fox argues that the Chicago school and its adherents have chosen a view of efficiency that trusts in “dominant firms” rather than “trust[s] in the dynamic of the competition process.”¹¹⁴ She believes that “this phenomenon has produced the Efficiency Paradox: In the name of efficiency, conservative theories of antitrust cut off the most promising paths to efficiency.”¹¹⁵

109. ADAMS & BROCK, *supra* note 15, at 302.

110. Fox, *supra* note 65, at 77 (discussing shifting perspectives in regard to antitrust).

111. Paul G. Mahoney & Chris Sanchirico, *Competing Norms and Social Evolution: Is the Fittest Norm Efficient?*, 149 U. PA. L. REV. 2027, 2039 (2000–2001) (emphasis omitted). The authors further observe that “[e]fficient norms can be surprisingly fragile in response to random shocks.” *Id.* at 2062.

112. BEINHOCKER, *supra* note 5, at 399; *see also* WILSON, *supra* note 1, at 292 (“In national balance sheets economists seldom use full-cost accounting . . .”).

113. ADAMS & BROCK, *supra* note 15, at 303 (discussing the inherent flaws in the neo-Darwinist vision). For an interesting argument that societal efficiency is in the eyes of the beholder, *see* ROBERT H. FRANK & PHILIP J. COOK, *THE WINNER-TAKE-ALL SOCIETY: WHY THE FEW AT THE TOP GET SO MUCH MORE THAN THE REST OF US* 167–77 (1996) (examining the curbing of wasteful competition).

114. Fox, *supra* note 65, at 77–78.

115. *Id.* at 78. Ironically, many of the Social Darwinists’ classic efforts to create scientific efficiencies have been notable historic failures because they failed to take humanness into account. *See, e.g.*, FRANCIS FUKUYAMA, *TRUST: THE SOCIAL VIRTUES AND THE CREATION OF PROSPERITY* 225–28 (1995) (discussing how Taylorism in the workplace “hid a number of ideological assumptions under the guise of scientific analysis,” and how its consequences “for labor-management relations in the industries in which it was implemented were both predictable and, in the long run, quite harmful”).

Questions about the true economic efficiency of dominant firms and monopolies abound. Justice Louis Brandeis argued nearly eight decades ago:

The only argument that has been seriously advanced in favor of private monopoly is that competition involves waste, while the monopoly prevents waste and leads to efficiency. This argument is essentially unsound. The wastes of competition are negligible. The economies of monopoly are superficial and delusive. The efficiency of monopoly is at the best temporary.¹¹⁶

Similarly, Adams and Brock assert, “[W]hen economic performance is actually examined . . . , it casts serious doubt on the assertion that bigness is the guarantor of operating efficiency, innovation efficiency, or social efficiency.”¹¹⁷ Numerous economic studies support these assertions.¹¹⁸ On the other hand, “[n]o widely accepted economic theory justifies the strong claim that antitrust law has caused large scale inefficiency.”¹¹⁹

Chicagoans concede that measuring overall economic efficiency is difficult or impossible.¹²⁰ Nevertheless, Chicagoans claim that

116. BRANDEIS, *supra* note 78, at 104, 105.

117. ADAMS & BROCK, *supra* note 15, at 303.

118. See, e.g., ZOLTAN J. ACS & DAVID B. AUDRETSCH, *INNOVATION AND SMALL FIRMS* 147 (1990) (“[C]ontrary to much of the conventional wisdom, innovative activity is apparently hindered, not promoted, in concentrated markets [sic]”); Joe S. Bain, *The General Explanation of the Development of Concentration*, in *MONOPOLY POWER AND ECONOMIC PERFORMANCE: THE PROBLEM OF INDUSTRIAL CONCENTRATION* 74, 78 (Edwin Mansfield ed., 1964) (“[T]he strength of the various concentration-increasing forces enumerated appears to have been such that concentration will frequently tend to be higher than the minimum required for efficiency. Industries probably tend to be ‘more concentrated than necessary’ for efficiency—and the larger firms bigger than necessary—because of the operation of monopolization, sales promotion, and financial motives, and because of specific entry barriers favoring a few firms in certain industries.”); Dennis C. Mueller, *The Finance Literature on Mergers: A Critical Survey*, in *COMPETITION, MONOPOLY AND CORPORATE GOVERNANCE* 161, 178 (2003) (“[T]he number of studies finding negative effects of mergers on operating performance is again too large to dismiss.”); Nelson et al., *supra* note 15, at 50 (“No single size firm is an optimum for conceiving and introducing all inventions of an industry. Rather, the optimum is a size distribution composed of small, medium, and large firms varying from industry to industry and from time to time.”); Jacob Schmookler, *Market Structure and Technological Change*, in *MONOPOLY POWER AND ECONOMIC PERFORMANCE: THE PROBLEM OF INDUSTRIAL CONCENTRATION*, *supra* note 15, at 52, 54–55 (“[E]xisting comprehensive indexes of output of new technical knowledge suggest that beyond a certain not very large size, the bigger the firm the less efficient its knowledge-producing activities are likely to be.”); Stigler, *supra* note 15, at 9 (“[N]o definite effect of big business on economic progress can be established. . . . Big businesses are not appreciably more efficient or enterprising than medium-sized businesses.”).

119. Carstensen, *supra* note 99, at 1176.

120. See ADAMS & BROCK, *supra* note 15, at 302 (“Although economic Darwinism makes superior economic performance the centerpiece of its policy position, its advocates concede that measuring such performance is inordinately difficult, if not downright impossible.”); see also Alfred E. Kahn, *Standards for Antitrust Policy*, in *MONOPOLY POWER AND ECONOMIC*

"[e]fficiency is the scientific linchpin of economics."¹²¹ Their "despair about the possibility of measuring economic performance"¹²² is therefore most troubling.¹²³

And what does evolutionary biology say about efficiency? According to Geerat Vermeij, "[E]mphasis on efficiency is misplaced. Economic success depends on absolute performance, and very often—in human-economic contexts as well as the evolutionary marketplace—high levels of performance go hand in hand with reduced efficiency."¹²⁴

PERFORMANCE: THE PROBLEM OF INDUSTRIAL CONCENTRATION, *supra* note 118, at 144, 157 ("The perplexing problem is that in their manifestations and exercise the competitive advantages stemming from gains in efficiency attributable to integration are in practice inseparable from the merely strategic advantages.").

121. Kenneth G. Elzinga, *The Goals of Antitrust: Other Than Competition and Efficiency, What Else Counts?*, 125 U. PA. L. REV. 1191, 1212 (1977).

122. ADAMS & BROCK, *supra* note 15, at 302. "Judge Easterbrook urges us 'to avoid econometric [i.e., empirical] answers when we can 'because' they are expensive as well as potentially indeterminate.'" *Id.* (citing Frank H. Easterbrook, *On Identifying Exclusionary Conduct*, 61 NOTRE DAME L. REV. 972, 979 (1986)). Similarly, Judge Bork admits that "[t]he real objection to performance tests and efficiency defenses in antitrust law is that they are spurious. They cannot measure the factors relevant to consumer welfare, so that after the economic extravaganza was completed we should know no more than before it began." BORK, *supra* note 106, at 124. Alfred E. Kahn has argued, "The fact is that economics offers no objective measure of the vitality of competition, in all its aspects . . ." Kahn, *supra* note 120, at 160.

123. Another problem is that new entry may not easily be able to knock out monopolies or dominant firms, not because of superior or more efficient economic performance, but because of strong first-in advantages. *See* ADAMS & BROCK, *supra* note 15, at 303 ("[N]eo-Darwinism assumes that any firm which no longer delivers superior performance will automatically be displaced by newcomers. This, of course, ignores the ability of powerful firms to build private storm shelters—or to lobby government to build storm shelters for them—in order to shield themselves from the Schumpeterian gales of creative destruction."); LOUIS D. BRANDEIS, *On Maintaining Makers' Prices*, in *THE CURSE OF BIGNESS: MISCELLANEOUS PAPERS OF LOUIS D. BRANDEIS*, *supra* note 78, at 125, 127 ("And even where a complete monopoly does not exist, a powerful combination makes it so difficult for others to enter the field that most men are practically barred by the great chances of failure from entering upon so unequal a contest."); STEPHEN JAY GOULD, *Wonderful Life: The Burgess Shale and the Nature of History* 228–30 (1989) (discussing what Gould calls the "first filling of the ecological barrel"); ROGER LEWIN, *Complexity: Life at the Edge of Chaos* 123 (1992) ("We found that newly established species-rich communities are more difficult to invade than species-poor ones, but mature communities are even tougher."); MICHAEL ROTHSCILD, *Bionomics: Economy as Ecosystem* 192 (1990) ("[I]f a firm can somehow accelerate its own experience growth and/or slow down its competitors' experience accumulation, its competitive position will improve."); Bruce D. Henderson, *The Origin of Strategy*, 67 HARV. BUS. REV., no. 6, 1989 at 139, 141 ("The [competitive] trick lies in moving the boundary of advantage into the potential competitor's market and keeping that competitor from doing the same.").

124. VERMEIJ, *supra* note 9, at 124. Vermeij adds, "In our technological world, internal combustion engines and atomic power plants give off vast amounts of unused heat, but their power yield is so great and provides such clear economic advantages that their inefficiency is tolerated, much as it is in warm-blooded animals." *Id.* at 125. Indeed, can we think of any living organism that is more inefficient than humans in terms of exploiting natural resources?

Indeed, Chicagoans necessarily concede that “[e]conomic efficiency does not always square with the term as used in engineering.”¹²⁵ Moreover, Chicagoans have little to say about dynamic and adaptive efficiencies.

Chicagoans’ view of economic efficiency does not square with nature’s push for ecological diversity, redundancy, and consequent adaptability and dynamism.¹²⁶ “Statistical studies have shown that the most diverse animals are not only small in size, but also highly mobile, giving them access to the most bountiful variety of foods and other resources.”¹²⁷ Thus, in biological ecosystems, large size and dominance are not synonymous with efficiency.¹²⁸

Furthermore, economic monopolies ultimately are the results of “top-down intentional policies,” rather than the “bottom-up self-organization” present in natural evolutionary ecosystems.¹²⁹ A review of the information systems (“IS”) “literature shows that preconceived, top-down IS designs will always disappoint in the long term, as they do not allow internal complexity to evolve in line with the imposing resources, limitations, competitors, tensions, and complexity of their environments.”¹³⁰ In addition, the positive feedbacks endemic to

125. Elzinga, *supra* note 121, at 1192 n.4. Elzinga adds, “Economic efficiency involves choosing the cost minimizing technique from among those technologically feasible.” *Id.*

126. For example, Eric Bonabeau and Christopher Meyer have argued,

[S]ocial insects have been so successful—they are almost everywhere in the ecosphere—because of three characteristics: flexibility (the colony can adapt to a changing environment); robustness (even when one or more individuals fail, the group can still perform its tasks); and self-organization (activities are neither centrally controlled nor locally supervised).

Eric Bonabeau & Christopher Meyer, *Swarm Intelligence: A Whole New Way to Think About Business*, 79 HARV. BUS. REV., no. 5, 2001 at 107, 108.

127. WILSON, *supra* note 70, at 210. Wilson adds, “Entomologists are often asked whether insects will take over if the human race extinguishes itself. This is an example of a wrong question inviting an irrelevant answer: insects have already taken over.” *Id.* at 210–11. Small size is one of the key factors accounting for the “preeminence and hyperdiversity” of insects. *Id.* at 211. Indeed, tiny bacteria may be the most adaptable and resilient organisms on our planet. “In fact, the extent of microbial diversity is so great that scientists have difficulties estimating its actual size.” Jonathon Shaw, *The Undiscovered Planet: Microbial Science Illuminates a World of Astounding Diversity*, HARV. MAG., Nov.–Dec. 2007, at 44; see also GOULD, *supra* note 88, at 323 (arguing that bacteria have “a better hope for long-term survival” than humans).

128. In nature, “[g]iantism may be adaptive along the way, but it is ultimately unadaptive.” ROBERT WESSON, *BEYOND NATURAL SELECTION* 192 (1991).

129. VERMEIJ, *supra* note 9, at 54.

130. Hind Benbya & Bill McKelvey, *Toward a Complexity Theory of Information Systems Development*, 19 INFO. TECH. & PEOPLE 12, 27 (2006). They further argue, “[C]urrent top-down methods of IS design are unable to deal with the challenge of evolutionary complexity resulting from the evolution of user requirements and needs.” *Id.* at 28. They also frame “the process of mutual adaptation not just as a matter of alignment but as a dynamic interplay over time of co-evolving interactions, relationships and effects.” *Id.*; cf. LEWIN, *supra* note 123, at 189 (arguing

natural evolutionary ecosystems are “not achievable in a monopoly or in a system of inflexible top-down control.”¹³¹

The necessity for redundancies and limited interdependencies (to avoid complexity catastrophes)¹³² in complex adaptive systems may also mean that there are inherent limits to the stable economies of scale that can be achieved by any organism (or, by analogy, business through internal growth or mergers). As companies grow, their internal networks and interdependencies also increase. Ironically, competitors seeking to merge often seek to label such growth as an increase in efficiency. Yet “of all of the areas of biology and ecology, few are less understood than interspecific dependencies. Ecologists cannot even identify all of the interdependencies in the systems they understand best.”¹³³

Nevertheless, we know that nature inherently limits the number of organisms in any ecological food web and “that the food chains making up the web are very short,” usually five or fewer links.¹³⁴ Moreover, “the number of links in the food web does not increase as the size of the community increases.”¹³⁵

Why would nature consistently limit food webs to five levels, and what might that mean for economics and antitrust? The simple answer may be that networks (or economic entities) that are too dense or too

that both the top-down and bottom-up “directions are important, linked in a tight, never-ending feedback loop”).

131. VERMEIJ, *supra* note 9, at 256.

132. See *supra* note 104 and accompanying text (discussing how to avoid the complexity catastrophe).

133. Bryan Norton, *Commodity, Amenity and Morality: The Limits of Quantification in Valuing Biodiversity*, in BIODIVERSITY, *supra* note 73, at 200, 203.

134. WILSON, *supra* note 70, at 180. Wilson adds:

For example: in a marshy glade of the north central states, reedgrass is eaten by short-horned grasshoppers, the grasshoppers are eaten by orb-weaver spiders, the spiders are eaten by palm warblers, and the warblers are eaten by marsh hawks. Because the grass eats no one and the hawks are eaten by no one (except by bacteria and other decomposers when they die), these two species form the ends of the chain.

Id.

135. *Id.* (“No matter how many species manage to persist in the community, the average number of links from a given plant species to a given top predator does not increase.”). Interestingly, in the field of mathematics, David Barrington similarly has proven “that a circuit constructed entirely of branching gates with *no more than five levels* of gates can solve what is called the majority problem: in a string of O’s and I’s, is there a majority of I’s?” PAUL HOFFMAN, ARCHIMEDES’ REVENGE: THE CHALLENGE OF THE UNKNOWN: THE JOYS AND PERILS OF MATHEMATICS 171–72 (1988) (emphasis added). Prior to Barrington’s five gate levels solution, “[c]omplexity theorists had universally (and wrongly) believed that branching gates restricted to *any* fixed height—let alone the tough restriction of five stories—could not solve the majority problem.” *Id.* at 172.

extensive can *decrease* the adaptability and long-term health and stability of an economy or ecosystem.¹³⁶ For example, in the early development of information systems, “[t]he parts of many IS were so tightly coupled that it was impossible to continually evolve.”¹³⁷

In short, there appear to be intrinsic limits to the economies of scale that practically can be obtained by any economic entity.¹³⁸ Theoretical physicist Geoffrey West made this point in June 2010 when discussing “universal scaling laws” in both biology and physics as applied to Google.¹³⁹ West observed:

The major tension here is between economies of scale (spending less per capita as we get bigger) and open-ended wealth creation (getting more per capita as we grow). Google is an extraordinarily innovative organization but it’s already struggling with economies of scale and inevitably becoming more bureaucratic. This tension might even be part of the very nature of building organizations; there’s almost a kind of Darwinian evolutionary nature to this.¹⁴⁰

Therefore, it should not have come as a surprise when *The Economist* boldly stated in 1994, “[T]he real disappointment about mergers is that on average, they do not result in higher profits or greater efficiency; indeed they often damage these things.”¹⁴¹ In sum, there appears to be little quantitative or qualitative evidence showing that most mergers

136. See Andrew Stirling, *On the Economics and Analysis of Diversity* 10 (Sci. & Tech. Policy Research Elec. Working Paper Series, Paper No. 28, 1998). Stirling further asserts, “A condition of optimal diversity falls somewhere between two extremes in the degree of connectedness of an economic system: dense homogeneity on the one hand and complete fragmentation on the other.” *Id.* Monopolies and oligopolies, of course, fall closer to the extreme of dense homogeneity.

137. Benbya & McKelvey, *supra* note 130, at 25. Benbya and McKelvey further observe that diversity and variability are important because “adaptation can proceed no faster than the rate that usable variation . . . becomes available.” *Id.* at 23; see also Howard M. Metzenbaum, *Telecommunications Policy: Protecting Consumers by Promoting Diversity*, 35 N.Y.L. SCH. L. REV. 619, 619 (1990) (“Let me start with a simple proposition: when the ‘product’ being delivered to consumers is information . . . public policy should promote diversity and restrain excessive market power.”).

138. See Stirling, *supra* note 136, at 12 (“[T]hough some economies of scale may be foregone in diversification, diversity may also allow the realizing of certain economies of system or scope.”). Stirling adds, “Put simply, the bottom line is that many economists are coming to suspect . . . that “[o]rganizational diversity could be a source of higher global welfare.” *Id.* at 10; see also Ferguson, *supra* note 29 (“Economies of scale and scope are not always the driving force of financial history. More often, the real drivers are the process of speciation—when new types of companies are created . . .”).

139. *Rethinking Scale, Interview with Geoffrey West*, ALLIANCE, June 1, 2010, at 32, available at <http://www.alliancemagazine.org/en/content/interview-geoffrey-west>.

140. *Id.* at 33.

141. *The Trouble With Mergers*, ECONOMIST, Sept. 10, 1994, at 13.

ultimately are efficiency-enhancing, while a growing body of empirical and theoretical literature suggests that they are not.¹⁴²

C. Natural Ecosystems and Monopoly

Biological analogs to economic monopolies are either “short-lived” or non-existent in nature.¹⁴³ And in natural ecosystems, competition “is generally more intense within species than between species.”¹⁴⁴ Biologist August Forel “was correct in observing that ‘the greatest enemies of ants are other ants, just as the greatest enemies of men are other men.’”¹⁴⁵ An ecosystem without some level of intraspecies competition is difficult to imagine for the simple reason that ubiquitous genetic variability ensures opportunities for reproduction.

Chicagoans counter by arguing that dominant or keystone species in nature are analogous to economic monopolies,¹⁴⁶ and that they “can enhance the productivity of their ecosystems in a variety of ways.”¹⁴⁷ Biological field studies show, however, that intense competition “is more common . . . in species belonging to stable ecosystems than in those belonging to unstable ecosystems.”¹⁴⁸ Moreover, “dominant species have been repeatedly shown to reduce species diversity and abundance within their territories.”¹⁴⁹ In nature, therefore, dominant species are a function of “impoverished faunas.”¹⁵⁰

142. See, e.g., Spencer Weber Waller, Corporate Governance and Competition Policy 43–44 (Sept. 23, 2010) (working paper), available at <http://ssrn.com/abstract=1681673>) (“[T]here is mounting evidence from corporate finance communities that suggests entire categories of deals are more fraught with peril and more likely to destroy, rather than enhance, shareholder value. . . . Together, these sources and studies suggest that certain categories of mergers destroy shareholder value and do little if anything to create meaningful efficiencies or enhance market competition [Furthermore], [t]he corporate finance literature has suggested that certain identifiable categories of mergers typically destroy, rather than enhance shareholders’ value.”).

143. VERMEIJ, *supra* note 9, at 302; see also *supra* note 80 (noting positive attributes of monopolies).

144. WILSON, *supra* note 59, at 120.

145. HÖLLDOBLER & WILSON, *supra* note 83, at 398. The authors observe, “Interference competition among ants can be demonstrated within hours or even minutes anywhere in the world merely by placing food baits on the ground.” *Id.* They further note, “[C]ompetition is the hallmark of ant ecology.” *Id.* at 419.

146. See, e.g., IANSITI & LEVIEN, *supra* note 58, at 223–24; WRIGHT, *supra* note 20, at 330 (“John D. Rockefeller said that the withering of weak companies in a laissez-faire economy was ‘the working-out’ of a law of nature and a law of God” (quoting RICHARD HOFSTADTER, SOCIAL DARWINISM IN AMERICAN THOUGHT 45 (1944))).

147. IANSITI & LEVIEN, *supra* note 58, at 69.

148. WILSON, *supra* note 59, at 120.

149. HÖLLDOBLER & WILSON, *supra* note 83, at 423. Moreover, Hölldobler and Wilson “have noticed a worldwide tendency in the relation between behavior and species diversity, as follows: the fewer the ant species in a local community, the more likely the community is to be dominated behaviorally by one or a few species with large, aggressive colonies that maintain

Chicagans long have argued successfully that we should resist antitrust deconcentration efforts towards dominant firms and monopolies.¹⁵¹ Yet in natural ecosystems, to ensure long-term adaptability and survivability, dominant groups “tend to divide into multiple species [through adaptive radiation] that adopt different ways of life.”¹⁵² Furthermore,

[D]ominant groups that have diversified to this degree, such as the Hawaiian honeycreepers and placental mammals, are on average better off than those composed of only a single species; as a purely incidental effect, highly diversified groups have better balanced their investments and will probably persist longer into the future.¹⁵³

The idea that competitively induced diversity enhances overall fitness is not new to biology. In 1859, Charles Darwin “argued that island ecosystems are more invulnerable because their level of competition is too weak to exclude introduced species.”¹⁵⁴ Evolutionary biology therefore supports Justice Louis Brandeis’s admonition that

no monopoly in private industry has yet been attained by efficiency alone. . . . No business has been so superior to its competitors in the processes of manufacture or of distribution as to enable it to control the market solely by reason of its superiority. There is nothing in our industrial history to indicate that there is any need whatever to limit

absolute territories.” *Id.*

150. *Id.* (“In the regions where the dominants occur . . . the faunas as a whole are small.”).

151. William E. Kovacic, *Failed Expectations: The Troubled Past and Uncertain Future of the Sherman Act as a Tool for Deconcentration*, 74 IOWA L. REV. 1105, 1139 (1989) (“[T]he broad acceptance of Chicago School perspectives toward dominant firms . . . seem[s] to signal the end of the section two government divestiture suit.”); see also Frederick Rowe, *The Decline of Antitrust and the Delusions of Models: The Faustian Pact of Law and Economics*, 72 GEO. L.J. 1511, 1539 (1984) (“[T]he antitrust crusade against the concentration of economic power has foundered.”).

152. WILSON, *supra* note 70, at 129.

153. *Id.* at 129–30. Wilson further notes, “The mammals of North American origin proved dominant as a whole over the South American mammals, and in the end they remained the more diverse.” *Id.* at 130. Their diversity, Wilson argues, enabled them “to penetrate sparsely occupied niches more decisively, radiating and filling them quickly.” *Id.*

154. Leigh et al., *supra* note 78, at 6 (citing CHARLES DARWIN, *ON THE ORIGIN OF SPECIES* (1859)); see also VERMEIJ, *supra* note 9, at 189–90 (citing JARED DIAMOND, *GUNS, GERMS, AND STEEL: THE FATE OF HUMAN SOCIETIES* (1997)) (discussing why Southwest Asia has “exceptionally” favorable and competitive biota, which allowed humans to domesticate plants and animals). Because of this development in agriculture, population grew and diseases spread. As a result, this population of people developed partial immunity and perfected the art of warfare, not because they were inherently superior but because of the biota in which they lived. VERMEIJ, *supra* note 9, at 156 (“For species that evolve and remain restricted in small, isolated islands, selection for high performance reaches an effective limit dictated by the island’s size and productivity.”).

the natural growth of a business in order to preserve competition. We may emphatically declare: "Give fair play to efficiency."¹⁵⁵

Furthermore, one of the most insidious aspects of monopolies and dominant firms often ignored by economists is that they erode and destroy the communal values of reciprocity and trust¹⁵⁶ that underlie the efficiency of our capitalistic free-market economy.¹⁵⁷ "Monopolies exercise power without constraint or modification by other competitors, and therefore do not act for the larger common good of those around them."¹⁵⁸ Culture and community are directly related to economic efficiency, as "societies can save substantially on transaction costs [when] economic agents trust one another in their interactions and therefore can be more efficient than low-trust societies."¹⁵⁹ Generally, trust is maximized "when a community shares a set of moral values in such a way as to create expectations of regular and honest behavior."¹⁶⁰ For example, an interdisciplinary team of fourteen anthropologists, sociologists, psychologists, and economists recently concluded:

The efficiency of market exchange involving infrequent or anonymous interactions improves with an increasingly shared set of motivations and expectations related to trust, fairness, and cooperation. This lowers transaction costs, raises the frequency of successful transactions, and increases long-term rewards.¹⁶¹

155. LOUIS D. BRANDEIS, *Competition, in THE CURSE OF BIGNESS: MISCELLANEOUS PAPERS OF LOUIS D. BRANDEIS*, *supra* note 78, at 112, 114–15.

156. See, e.g., Maurice E. Stucke, *Money, Is That What I Want?: Competition Policy and the Role of Behavioral Economics*, 50 SANTA CLARA L. REV. 893, 900–01 (2010) ("Until recently, almost all economic models assumed that people exclusively pursued their material self-interest and did 'not care about 'social' goals per se.'" (citing Ernest Fehr & Klaus M. Schmidt, *A Theory of Fairness, Competition, and Cooperation*, in *ADVANCES IN BEHAVIORAL ECONOMICS* 271, 271 (Colin F. Camerer et al. eds., 2004))).

157. See *United States v. Aluminum Co. of Am.*, 148 F.2d 416, 427 (2d Cir. 1945) ("Many people believe that possession of unchallenged economic power deadens initiative, discourages thrift and depresses energy; that immunity from competition is a narcotic, and rivalry is a stimulant, to industrial progress; that the spur of constant stress is necessary to counteract an inevitable disposition to let well enough alone."); Stucke, *supra* note 16, at 527–30 ("[C]ourts have long recognized a concern that monopolies tend to impoverish [individuals and their community].").

158. VERMEIJ, *supra* note 9, at 301; see also Stucke, *supra* note 16, at 514 ("Contrary to the assumption that imitators pursue the monopolist, monopolists at times pursue the innovators.").

159. FUKUYAMA, *supra* note 115, at 352.

160. *Id.* at 153.

161. Joseph Henrich et al., *Markets, Religion, Community Size, and the Evolution of Fairness and Punishment*, *SCI.*, Mar. 19, 2010, at 1480. The authors add,

Much research suggests that norms arise because humans use evolved learning mechanisms to calibrate their behavior, motivations, and beliefs to variable circumstances. Modeling work shows that when these learning mechanisms are applied to different kinds of social interactions, such as large-scale cooperation or ephemeral exchange, individually costly behaviors can be sustained by punishment, signaling, and

Unfortunately, history has shown over and over that monopolies and dominant firms can, and do, behave badly and cannot be trusted.¹⁶²

Ultimately, the power of monopolies and dominant firms “seems to rest on the exploitation rather than the enhancement of their resource base, that is, on the erosion of feedbacks that promote the larger common good.”¹⁶³ A monopolist’s selfish and predatory actions “may therefore damage the web of interactions in the economy that sustains the monopoly, and lead to economic instability and to a greater vulnerability to disruption.”¹⁶⁴

There is little valid scientific or historical reason for us to pay homage to economic monopolies or dominant firms. Nevertheless, we continue to allow monopolies and dominant firms to amass substantial levels of power¹⁶⁵ unseen in the natural world around us. Economists

reputational mechanisms. By sustaining such behaviors, norms can facilitate trust, fairness, and cooperation in a diverse array of interactions, thereby allowing the most productive use of unevenly distributed skills, knowledge, and resources, as well as increasing cooperation in exchange, public goods, and warfare. More-effective norms and institutions can spread among societies by a variety of theoretically and empirically grounded mechanisms, including conquest and assimilation, preferential imitation of more successful societies, or forward-looking decision making by leaders or high-status coalitions.

Id.

162. See, e.g., *Am. Tobacco Co. v. United States*, 328 U.S. 781, 783, 814–15 (1946) (convicting defendants of conspiracy of restraint of trade and monopolization, among other counts); *United States v. Am. Tobacco Co.*, 221 U.S. 106, 185–88 (1911) (holding defendants guilty of violating the Sherman Act by imposing restraints on trade and attempting to monopolize interstate tobacco commerce); *Standard Oil Co. v. United States*, 221 U.S. 1, 72–81 (1911) (finding Standard Oil guilty of monopolizing the petroleum industry by using its size to vertically integrate, acquiring ownership of entities from the oil exploration stage through service stations offering their refined product to consumers, which allowed Standard Oil to undercut competitors’ costs to the point of bankruptcy or a sell out; Standard Oil was disbanded into several competing firms); *United States v. Microsoft Corp.*, 253 F.3d 34, 45–46, 106–07 (D.C. Cir. 2001) (imposing antitrust penalty when Microsoft bundled Internet Explorer with its operating system, thus monopolizing the web browser market); *United States v. Aluminum Co. of Am.*, 148 F.2d 416, 432 (2d Cir. 1945) (finding that Alcoa operated as a monopoly, regardless of whether Alcoa intended to create a monopoly or whether it achieved market dominance because of superior efficiency); see also Horton, *supra* note 2, at 214 (“History has taught us that monopolists can and do sometimes act greedily and unethically, especially if they think they can.”).

163. VERMEIJ, *supra* note 9, at 302; see also KEFAUVER, *supra* note 16, at 190–91 (“In too many industries there has developed an essentially feudal economic structure—a small handful of dominant firms, with a medley of smaller producers who exist in the crevices of the monolithic structure and survive at the will of the major companies. . . . This situation poses problems of the utmost magnitude insofar as the effectiveness of the market mechanisms is concerned. The issue is whether the presence of giant corporate complexes leaves room for the natural, self-generating forces of the market to discharge their function.”).

164. VERMEIJ, *supra* note 9, at 301.

165. Vermeij aptly observes that in nature, “[f]ew attributes are more reliable indicators of absolute power than absolute size. . . . Large size—expressed as mass, volume, territory, or numbers—is widely associated with competitive dominance.” *Id.* at 136.

tend to forget that not only did Adam Smith presciently observe that business persons often conspire against the public,¹⁶⁶ but that “a core flaw of the corporations as an institutional form was the intrinsic lack of accountability caused by separating ownership from management.”¹⁶⁷ “[T]he bullying arrogance of the monopoly”¹⁶⁸ represents “powerful life forces escaping the normalizing checks of nature.”¹⁶⁹ Is it any wonder then that there is “a rising level of distrust in U.S. society?”¹⁷⁰

It is time to stop accepting Judge Bork’s *Antitrust Paradox* thesis that monopolies and dominant firms enhance consumer welfare through their economic efficiency. Instead, as the framers of the antitrust laws intended, we should focus on fair and ethical competition, which will enhance, rather than sacrifice, our economic system’s overall dynamic and adaptive efficiency. As Francis Fukuyama observes, “There is no necessary trade-off . . . between community and efficiency; those who pay attention to community may indeed become the most efficient of all.”¹⁷¹ Similarly, in the words of Alfred E. Kahn:

[W]hile the general American bias in favor of competition is indeed rationalized largely by an expectation that in the long run it will produce the best economic results, it is also true that fair competition is an ‘end in itself.’ For it is indissolubly linked with the noneconomic values of free enterprise—equality of opportunity, the channeling of the profit motive into social constructive channels, and the diffusion of economic power. . . . The essential task of public policy in a free enterprise system should be to preserve the framework of a fair field and no favors, letting the results take care of themselves.¹⁷²

Therefore, following the teachings of evolutionary biology, as well as the intent of the antitrust laws’ framers who intuitively understood its lessons,¹⁷³ we should apply the antitrust laws more aggressively to monopolies and dominant firms.

166. NACE, *supra* note 77, at 40 (citing SMITH, *supra* note 95).

167. *Id.*

168. VERMEIJ, *supra* note 9, at 301.

169. NACE, *supra* note 77, at 226.

170. FUKUYAMA, *supra* note 115, at 153.

171. *Id.* at 32.

172. Kahn, *supra* note 120, at 151–52; *see also* Fox, *supra* note 65, at 88 (“Antitrust enforcers and jurists can topple the Efficiency Paradox. They can do so by recognizing that the output/outcome paradigm is just one means to identify anticompetitive conduct and transactions; by appreciating that conservative economic presumptions are commonly misaligned with the reality of markets; and by adjusting the pendulum to put more trust in open markets and dynamic rivalry and less trust in the autonomy of dominant firms.”); Stucke, *supra* note 16, at 550 (“[P]romoting access to new entrants or small rivals is more important than condoning monopolies.”).

173. Fox & Sullivan, *supra* note 26, at 6 (“During the formative years of antitrust and for

IV. APPLYING EVOLUTIONARY BIOLOGY TO BEHAVIORAL ANTITRUST ISSUES SUCH AS PREDATORY AND EXCLUSIONARY CONDUCT

This part applies the lessons of evolutionary biology to behavioral antitrust issues. Section A first discusses the antitrust laws and their underlying notion of fair competition. It then reviews Chicagoans' views of the antitrust laws as essentially amoral, and explains why they generally are unimpressed by allegations of unfair or predatory competition. Section B then reviews the evolutionary importance of morality and ethics, and argues that it is time to return to a morals-based understanding and enforcement of our antitrust laws. Building on that discussion, Section C considers the further evolutionary importance of fairness and reciprocity, and applies them to behavioral antitrust analyses. This part concludes that returning to an antitrust policy that recognizes and incorporates the fundamental values of fairness and reciprocity will ultimately create a healthier, more stable, and more efficient economic ecosystem.

A. Fair Competition, Morality, and the Antitrust Laws

In enacting the antitrust laws, "Congress believed in competition."¹⁷⁴ In the debates prior to the laws' passage, "[n]ot much time was wasted in Congress on the display of the merits of competition. For purposes of legislation, it was more important to get a clear picture of the evil to be remedied, [and] the obstacles to free trade that were to be eliminated."¹⁷⁵ As observed by President Woodrow Wilson, "We are all agreed that 'private monopoly is indefensible and intolerable,' and our program is founded upon that conviction."¹⁷⁶

But how do we best protect the competitive process? The "anticompetitive conduct" requirement—also called 'exclusionary conduct,' 'deliberateness,' or 'willfulness'—has long been a part of Section 2 jurisprudence."¹⁷⁷ However, the problem of defining

many years thereafter, the notion that high concentration lessens competition was not a hypothesis to be confirmed or disproved by empirical evidence; it was a political consensus reflected in the law.").

174. HANS B. THORELLI, *THE FEDERAL ANTITRUST POLICY: ORIGINATION OF AN AMERICAN TRADITION* 226 (1954); *see also* 21 CONG. REC. 2457 (1890) (statement of Senator Sherman) ("[The Sherman Act] does not in the least affect combinations in aid of production where there is free and fair competition.").

175. THORELLI, *supra* note 174, at 227.

176. President Woodrow Wilson, Address to a Joint Session of Congress on Trusts and Monopolies (Jan. 20, 1914), *available at* <http://millercenter.org/scripps/archive/speeches/detail/3790>.

177. AM. BAR ASS'N, *SECTION OF ANTITRUST LAW, ANTITRUST LAW DEVELOPMENTS* 241 (6th ed. 2007) [hereinafter *ANTITRUST LAW DEVELOPMENTS*].

unlawful anticompetitive predatory and exclusionary conduct “has been one of the perennial challenges of antitrust analysis and enforcement from the days of Standard Oil to those of Microsoft.”¹⁷⁸ “Today, courts are in agreement that only ‘anticompetitive’ conduct will satisfy the exclusionary conduct element.”¹⁷⁹ But how do we distinguish good old-fashioned hard competition from anticompetitive conduct?¹⁸⁰

There can be little doubt that Congress sought to protect consumers “from practices that deprive them of the benefits of competition and transfer their wealth to firms with market power.”¹⁸¹ Part of the way to accomplish this was to focus on “the small business proprietor or tradesman whose opportunities were to be safeguarded from the dangers emanating from those recently-evolving elements of business that seemed so strange, gigantic, ruthless and awe-inspiring.”¹⁸² Applying Congress’ stated purposes prior to the ascendance of Chicagoans’ antitrust theories, “[v]iolations did not necessarily involve concentration; they often involved bullying, coercion, and collective action even in fragmented markets.”¹⁸³ Indeed, from the 1950s to the early 1970s, the Supreme Court “emphasized freedom of traders and competition among many players, not efficiency.”¹⁸⁴

178. Brendan Dowd, Andrew Frackman & Matthew Merrick, *Part Three: Current Developments in Sherman Act Section 2 Exclusionary Conduct Cases*, 2003 COLUM. BUS. L. REV. 526, 526; see also ANTITRUST LAW DEVELOPMENTS, *supra* note 177, at 241 (“Defining the contours of this element, however, has been one of the most vexing questions of antitrust law.”).

179. ANTITRUST LAW DEVELOPMENTS, *supra* note 177, at 241.

180. Professor Einer R. Elhauge has spoken for many antitrust lawyers and scholars in arguing that “for decades monopolization doctrine has been governed by standards that are not just vague but vacuous.” Einer R. Elhauge, *Defining Better Monopolization Standards*, 56 STAN. L. REV. 253, 255 (2003). Professor Elhauge advocates that the “proper monopolization standard should focus on whether the alleged exclusionary conduct succeeds in furthering monopoly power (1) only if the monopolist has improved its own efficiency or (2) by impairing rival efficiency whether or not it enhances monopolist efficiency.” *Id.* at 256.

181. Kirkwood & Lande, *supra* note 26, at 97.

182. THORELLI, *supra* note 174, at 227. Thorelli adds:

This is one reason why it was natural to adopt the old doctrines of the common law, doctrines whose meaning had been established largely in cases brought by business or professional people dissatisfied with the behavior of competitors. Perhaps we are even justified in saying that the Sherman Act is not to be viewed exclusively as an expression of economic policy. In safeguarding rights of the “common man” in business “equal” to those of the evolving more “ruthless” and impersonal forms of enterprise the Sherman Act embodies what is to be characterized as an eminently “social” purpose.

Id.

183. Fox, *supra* note 6, at 554, 574 n.108.

184. Eleanor M. Fox, *The Modernization of Antitrust: A New Equilibrium*, 66 CORNELL L. REV. 1140, 1152 (1981).

Following Congress' intent, predatory behavior includes "any unreasonably exclusionary business strategy not on competitive merits. It is normally designed to impose costs on a competitor, to deter entry, or to keep competitors from making the investment necessary to remain or advance in the market."¹⁸⁵ According to the ABA's Antitrust Law Section, "The Section 2 cases can usefully be divided into the following types of exclusionary behavior: vertical restrictions limiting competitor access to customers or suppliers, denials of rivals' requests for access, product design and new product introduction, predatory pricing, misuses of government and standard-setting processes, and tortious conduct."¹⁸⁶ Predatory acts can be particularly effective in signaling and deterring actual and potential competitors, and in cementing dominant firms' or monopolists' "reputations for predation and irrationality."¹⁸⁷

Chicagoans generally disagree.¹⁸⁸ They are singularly unimpressed by allegations of predatory or exclusionary behavior. Instead, Chicagoans view business competition as "a rational undertaking" with "profit maximization [as] the overriding consideration in the competitive universe."¹⁸⁹ From their perspective, "business competition simply may be amoral."¹⁹⁰ Many businesspeople and scholars "celebrate ruthless selfishness, extolling the profit motive, even greed, as business virtues . . . [and see] business [as] incompatible with morality."¹⁹¹ As stated by Andrew Carnegie, for example, "the most

185. Eleanor M. Fox & Lawrence A. Sullivan, *Anchoring Antitrust Economics—A Lexicon*, in REVITALIZING ANTITRUST IN ITS SECOND CENTURY: ESSAYS ON LEGAL, ECONOMIC, AND POLITICAL POLICY, *supra* note 15, at 73, 73.

186. ANTITRUST LAW DEVELOPMENTS, *supra* note 177, at 245.

187. Fox & Sullivan, *supra* note 185, at 74.

188. See, e.g., BORK, *supra* note 106, at 144–48 ("Unsophisticated theories of predation abound, leading to drastic overestimation of its likelihood [Allegations of economic predation] do not reflect theory but are only foolishly inapposite metaphors that ignore the constraints the market places upon firm behavior.").

189. James H. Michelman, *Some Ethical Consequences of Economic Competition*, in BUSINESS ETHICS: A PHILOSOPHICAL READER 30, 33 (Thomas I. White ed., 1993); see also MILTON H. FRIEDMAN, CAPITALISM AND FREEDOM 133 (40th anniversary ed. 2002) ("Few trends could so thoroughly undermine the very foundations of our free society as the acceptance by corporate officials of a social responsibility other than to make as much money for their stockholders as possible.").

190. Michelman, *supra* note 189, at 32.

191. Richard McCarty, *Business and Benevolence*, in BUSINESS ETHICS: A PHILOSOPHICAL READER, *supra* note 189, at 41, 41. McCarty adds, "Business ethics is a contradiction in terms, according to a familiar jest; and perhaps a subtle truth underlying that quip is just that the selfish profit motive successful business requires is intrinsically at odds with part of the requirements of morality." *Id.* (emphasis omitted).

ruthless and unfair business practices seem[ed] to be justified” to ensure the “survival of the fittest” and overall societal progress.¹⁹²

Applying the amoral business philosophy to antitrust, Chicagoans have announced that “antitrust has no ethical component.”¹⁹³ Indeed, economists generally do not accept “that something done by a corporation in its own self-interest can have any moral content,” as they “want to keep their science free of any kind of dependence on moral motivation.”¹⁹⁴ For example, Judge Bork argues, “Consumer welfare, as that term is used in antitrust, has no sumptuary or ethical component, but permits consumers to define by their expression of wants in the marketplace what things they regard as wealth.”¹⁹⁵ Accordingly, utility-maximizing consumers interacting amorally with profit-maximizing businesses will lead to the promised land of allocative efficiency.

On the other hand, Chicagoans view government regulation as “arbitrary, inefficient, and heavy-handed” outside interference that infringes on “rights to property and freedom to trade,”¹⁹⁶ and suppresses individuality, initiative, and creativity.¹⁹⁷ Relying upon their model of *Homo economicus* as a rational utility-maximizing consumer or profit-maximizing businessperson,¹⁹⁸ Chicagoans argue that without government interference,¹⁹⁹ *Homo economicus* will push the market

192. *Id.* at 46–47.

193. Maurice E. Stucke, *Better Competition Advocacy*, 82 ST. JOHN'S L. REV. 951, 989 (2008) (citing Herbert Hovenkamp, *Antitrust Violations in Securities Markets*, 28 J. CORP. L. 607, 609 (2003) (“[A]ntitrust has no moral content . . .”).

194. FUKUYAMA, *supra* note 21, at 259. Indeed, the question arises as to whether “an abstract, collective entity [can] be the sort of thing that assumes moral identity?” Robert J. Rafalko, *Corporate Punishment: A Proposal*, in BUSINESS ETHICS: A PHILOSOPHICAL READER, *supra* note 189, at 306, 307. Rafalko notes, “Regarding corporations as analogous to moral persons has one overriding drawback. Corporations are designed to limit liability, whereas no moral person is so exempted.” *Id.* at 308.

195. BORK, *supra* note 106, at 90.

196. Neoconservatives may argue that economic freedom is a moral value. While this may be so, “moral theories that value only one source and set to zero all others are likely to produce psychologically unrealistic systems that most people will reject.” Jonathon Haidt & Fredrik Bjorklund, *Social Intuitionists Answer Six Questions About Moral Psychology*, in 2 MORAL PSYCHOLOGY: THE COGNITIVE SCIENCE OF MORALITY: INTUITION AND DIVERSITY 181, 215 (W. Sinnott-Armstrong ed., 2008).

197. Eleanor M. Fox, *The Battle for the Soul of Antitrust*, 75 CALIF. L. REV. 917, 917 (1987).

198. See STIGLITZ, *supra* note 28, at 249 (“Most of us would not like to think that we conform to the view of man that underlies prevailing economic models, which is of a calculating, rational, self-serving, and self-interested individual. There is no room for human empathy, public spiritedness, or altruism Unfortunately, economists have pushed their model of rationality beyond its appropriate domain.”).

199. See Harvey J. Goldschmid, *Comment on Herbert Hovenkamp and the Dominant Firm: The Chicago School Has Made Us Too Cautious About False Positives and the Use of Section 2*

towards an equilibrium state of output-maximizing allocative efficiency.²⁰⁰ Predatory behavior is not to be feared, they argue, because: (1) it rarely, if ever, occurs,²⁰¹ (2) “competitor well-being, in itself, is not the purpose of our antitrust law”,²⁰² and (3) “competitive and exclusionary conduct look alike.”²⁰³ Economist George Stigler even has stated that “‘it would be embarrassing’ today to encounter the argument among economists that predatory pricing is used to achieve monopoly.”²⁰⁴ The Chicago School is so confident in the free marketplace that it has become obsessed with the alleged competitive costs of false positives.²⁰⁵

of the Sherman Act, in HOW THE CHICAGO SCHOOL OVERSHOT THE MARK, *supra* note 26, at 123, 125 (“The Chicago School would argue that new entry and self-correcting markets would alleviate the evils of dominance.”).

200. See, e.g., BORK, *supra* note 106, at 178–79 (arguing that monopolies and dominant firms tend to create economic efficiency); Easterbrook, *Limits of Antitrust*, *supra* note 48, at 1 (discussing how antitrust law encourages cooperation in order to increase economic productivity); Eleanor M. Fox, *Consumer Beware Chicago*, 84 MICH. L. REV. 1714, 1718 (1986) (“Chicagoans believe that the most vital dynamic effects of business action are likely to flow from letting businesses do what they choose.”).

201. See Fox & Sullivan, *supra* note 26, at 73, 74 (“The cost of predation will virtually always exceed the expected pay-back, and a rational firm will almost never choose a predation strategy. Predation is so rare, suits alleging predation are so likely to be perverse strategies of inefficient firms seeking protection, and low prices are so beneficial to consumers, that all low pricing behavior should be legal *per se*.”).

202. Barnett, *supra* note 59, at 35.

203. Easterbrook, *Exclusionary Conduct*, *supra* note 48, at 345.

204. Fred S. McChesney, *Be True to Your School: Chicago's Contradictory Views of Antitrust and Regulation*, in THE CAUSES AND CONSEQUENCES OF ANTITRUST: THE PUBLIC-CHOICE PERSPECTIVE, *supra* note 3, at 323, 340 (quoting GEORGE STIGLER, *The Economists and the Problem of Monopoly*, in THE ECONOMIST AS PREACHER AND OTHER ESSAYS 52 (1982)); see also John S. McGee, *Predatory Price Cutting: The Standard Oil (N.J.) Case*, 1 J.L. & ECON. 137, 168 (1958) (arguing that Standard Oil did not use price cutting in its march to monopoly because “[t]o do so would have been foolish; and, whatever else has been said about them, the old Standard organization was seldom criticized for making less money when it could readily have made more”).

205. See Easterbrook, *Exclusionary Conduct*, *supra* note 48, at 349 (discussing the need to test models with empirical evidence, by gathering data, running regressions, and publishing in journals); see also *Leegin Creative Leather Prods., Inc. v. PSKS, Inc.*, 551 U.S. 877, 894–95 (2007) (noting that *per se* rules can be counterproductive by actually increasing the cost of the antitrust system); *Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398, 414 (2004) (“Mistaken inferences and the resulting false condemnations are especially costly, because they chill the very conduct the antitrust laws are designed to protect.” (quoting *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 594 (1986))); Maurice E. Stucke, *Does the Rule of Reason Violate the Rule of Law?*, 42 U.C. DAVIS L. REV. 1375, 1383 (2009) (“But while the Roberts Court has addressed the risk of false positives under its *per se* rule, it has never addressed the deficiencies of its rule of reason under rule-of-law principles.”).

B. *The Evolutionary Importance of Morality and Ethics*

As this section discusses, from a real world evolutionary and ethical perspective, assumptions of pure rationality and amorality are baseless. Put another way, “[t]he concept of survival of the fittest leads toward crude individual or group selfishness and a narrow notion of success as self-imposition, with implications of amorality, if not immorality.”²⁰⁶ If our evolutionary history proves anything, it reveals that “[t]he audaciously destructive tendencies of our [human] species run deep and are poorly understood. They are so difficult to probe and manage as to suggest an archaic biological origin.”²⁰⁷ Given that “[t]he largest part of aggression among members of the same species can be viewed as a set of behaviors that serve as competitive techniques,”²⁰⁸ it is naïve (and a denial of history) to assume that businesspersons will not sometimes aggressively resort to cutthroat and irrational predatory tactics²⁰⁹ to destroy their competitors and the competitive process itself.²¹⁰

206. WESSON, *supra* note 128, at 307. Steven Pinker complains that in our current society, “many behaviors have been amoritized.” PINKER, *supra* note 18, at 275.

207. EDWARD O. WILSON, *BIOPHILIA* 118 (1984). As Wilson further notes in *CONSILIENCE*, *supra* note 1, at 340–41, “[t]he deep roots of tribal strife and war are effectively illustrated in preliterate societies” by LAWRENCE H. KEELEY, *WAR BEFORE CIVILIZATION* (1996), and in modern times by DANIEL PATRICK MOYNIHAN, *PANDEMONIUM: ETHNICITY IN INTERNATIONAL POLITICS* (1993), and DONALD KAGAN, *ON THE ORIGINS OF WAR AND THE PRESERVATION OF PEACE* (1995). Indeed, “[m]oral sense theories are . . . often criticized for concentrating on benevolent traits and ignoring or even denying the darker side of human nature. . . . The picture that emerges . . . is a picture of an exceedingly dangerous creature for whom even morality itself can become a weapon.” D. M. Yeager, *From Biology to Social Experience to Morality: Reflections on the Naturalization of Morality*, in 30 *TRADITION & DISCOVERY: POLANYI SOC’Y PERIODICAL*, no. 3, 2004 at 31, 36.

208. WILSON, *supra* note 59, at 119. Our “dark side” evolved along with our moral side to help us survive in a dangerous world. As noted by Edward O. Wilson:

Of course nature has a dark side too. The face it presents to humanity is not always friendly. Throughout most of human deep history there have been predators eager to snatch us for dinner; venomous snakes ready with a fatal, defensive strike to the ankle; spiders and insects that bite, sting, and infest; and microbes designed to reduce the human body to malodorous catabolic chemicals. The reverse side of nature’s green-and-gold is the black-and-scarlet disease of death.

EDWARD O. WILSON, *THE FUTURE OF LIFE* 141 (2002).

209. Edward O. Wilson has reported “eight distinct types of aggression from among numerous species in the animal kingdom,” including “[d]ominance aggression,” “[m]oralistic aggression,” “[p]redatory aggression, either interspecific or cannibalistic,” and “[a]ntipredatory aggression.” MARY MAXWELL, *MORAL INERTIA: IDEAS FOR SOCIAL ACTION* 144 (1991) (citing WILSON, *supra* note 59, at 118–19).

210. See *BRANDEIS*, *supra* note 155, at 115 (explaining how many industries, including the Oil Trust and Tobacco Trust, partook in ruthless business conduct and violated the law in order to gain control of the market). Justice Brandeis went so far as to argue that “[i]t will be found that wherever competition has been suppressed it has been due either to resort to ruthless processes, or by improper use of inordinate wealth and power.” *Id.* Similarly, Adams and Brock observe:

[E]conomic Darwinists extol the private profit motive. They glorify the “invisible

Meaningful analyses of competition and attempts to subvert the competitive process must take “into account the thought processes of flesh-and-blood people.”²¹¹ As argued by Steven Pinker, a leading expert on language and the mind, “[T]he denial of human nature can be more dangerous than people think.”²¹² We should not be surprised, therefore, that “[a]s competition is [often] decided at performance boundaries (including ethical boundaries), high performance, highly competitive companies frequently make decisions that are ethically marginal (both in the sense of operating at the boundary and in being open to ethical challenge).”²¹³ As such, these companies resort to what Robert Solomon and Ed Freeman have labeled as “cowboy capitalism.”²¹⁴

Given humans’ innate biological propensities for potential viciousness, aggression,²¹⁵ and irrationality, we must abide by rules that help keep our darker sides in check. Antitrust laws “set fair rules of the game,”²¹⁶ and serve as a kind of “positional arms control agreement[]” that prevents economic competition from devolving into potentially lethal free-for-alls.²¹⁷

hand.” But in their dithyrambic zeal, they forget that private interest and social service are not necessarily synonymous. They ignore the fact that profits and size can be attained in antisocial ways. Unrestrained market “freedom,” for example, can include monopolization, oligopolization, collusion, and anticompetitive mergers and “joint ventures.” Untrammelled market freedom includes the freedom to destroy the market as an effective regulatory mechanism by private interests unwilling to submit to competition’s disciplining constraint.

ADAMS & BROCK, *supra* note 15, at 304.

211. PINKER, *supra* note 18, at 71; *see also* ROBERT C. SOLOMON, *ETHICS AND EXCELLENCE: COOPERATION AND INTEGRITY IN BUSINESS* 187 (1992) (“Business is a human enterprise.”).

212. PINKER, *supra* note 18, at 139.

213. Dennis R. Balch & Robert W. Armstrong, *Ethical Marginality: The Icarus Syndrome and Banality of Wrongdoing*, 92 J. BUS. ETHICS 291, 291–92 (2010).

214. SOLOMON, *supra* note 211, at 65 (citations omitted); *see also* Balch & Armstrong, *supra* note 213, at 292 (“History demonstrates that many corporate leaders lack the ethical sophistication to judge marginal decisions adequately. Serious wrongdoing in business is anything but rare.”); Niki A. den Nieuwenboer & Muel Kaptein, *Spiraling Down into Corruption: A Dynamic Analysis of the Social Identity Processes that Cause Corruption in Organizations to Grow*, 83 J. BUS. ETHICS 133, 134 (2008) (arguing that some corporate “social structures inhibit, enable, and stimulate people to commit corruption, and may even force people into corruption”).

215. Pinker argues that “aggressiveness was constrained and the old forms of primate dominance replaced by complex social skills.” PINKER, *supra* note 18, at 110 (citing WILSON, *supra* note 59, at 569).

216. Fox & Sullivan, *supra* note 26, at 2, 18.

217. FRANK & COOK, *supra* note 113, at 172. Frank and Cook point to the rule against excessive roughness found in virtually every contact sport. One football team could enhance its chances of winning if it could somehow injure important players on opposing teams. Other teams would inevitably retaliate, however, and in the end each side would suffer injuries with no net gain in competitive

In fairness, most Chicagoans concede that “the existence and causes of market malfunction make some government intervention inescapable.”²¹⁸ But they believe that the tort laws will remedy such issues—history notwithstanding. Fortunately, the courts generally have held that “conduct that otherwise qualifies as exclusionary for [Sherman Act] Section 2 purposes is not excluded because it independently violates some other set of laws.”²¹⁹

Chicagoans also fail to recognize that morals and ethics have been biologically and culturally crucial to humans’ abilities to cooperate and build and maintain exchange markets.²²⁰ Research shows that morality is both deep-seated in human nature and critical to holding societies together.²²¹ Our deep-rooted sense of morality has been forged and honed by natural selection as a counter to our protective, aggressive instincts.²²² Despite our darker side, our moral capacities have allowed

advantage. Roughness penalties curb this tendency, to the benefit of players, owners, and spectators alike.

Id. at 171; see also Keith N. Hylton, *Intent in Tort Law* 4 n.8 (Bos. Univ. Sch. of Law Working Paper No. 09-21, Apr. 22, 2009) (discussing the “double-effect problem,” which “arises when someone takes an action that may harm the victim but also may produce another effect, such as the brush-back pitch in baseball”).

218. ROBERT HEILBRONER & LESTER THUROW, *ECONOMICS EXPLAINED: EVERYTHING YOU NEED TO KNOW ABOUT HOW THE ECONOMY WORKS AND WHERE IT’S GOING* 163 (1998); see also POSNER, *supra* note 28, at 107 (noting, as one example of a market failure, the acceptance by profit-maximizing businessmen of the tiny probability that their conduct may deleteriously affect the entire economy); Maurice E. Stucke, *Reconsidering Competition and the Goals of Competition Law* 18 (Univ. of Tenn. Coll. of Law Legal Studies Research Paper No. 123, Oct. 2010), available at <http://ssrn.com/abstract=1646151> (“So even for rational-choice theorists like Judge Posner, the government must serve as a countervailing force to such self-interested rational private behavior by better regulating financial institutions.”).

219. ANTITRUST LAW DEVELOPMENTS, *supra* note 177, at 298; see also *Conwood Co. v. U.S. Tobacco Co.*, 290 F.3d 768, 784 (6th Cir. 2002) (“[M]erely because a particular practice might be actionable under tort law does not preclude an action under the antitrust laws as well. ‘Anticompetitive’ conduct can come in too many different forms, and is too dependent upon context, for any court or commentator to have enumerated all the varieties.”).

220. See, e.g., RICHARD LEAKEY & ROGER LEWIN, *ORIGINS RECONSIDERED: IN SEARCH OF WHAT MAKES US HUMAN* 304–05 (1992) (“On top of the technical skills of planning, coordination, and technology, there was, equally important, the social skill of cooperation. A sense of common goals and values, a desire to further the common good, cooperation was more than individuals working together. It became a set of rules of conduct, of morals, and understanding of right and wrong in a complex social system.”); Henrich et al., *supra* note 161, at 1484 (“[T]he rate-determining step in societal evolution may have involved the assembly of the norms and institutions that are capable of harnessing and extending our evolved social psychology to accommodate life in large, intensely cooperative communities.”).

221. MAXWELL, *supra* note 209, at 117; see also David Brooks, Op-Ed., *The End of Philosophy*, N.Y. TIMES, Apr. 7, 2009, at A29 (“The first nice thing about this evolutionary approach to morality is that it emphasizes the social nature of moral intuition. . . . The second nice thing is that it entails a warmer view of human nature.”).

222. See Richard Joyce, *Is Human Morality Innate?*, in *PHILOSOPHY AFTER DARWIN*:

us to develop and sustain cooperative reciprocity-based interactions with unrelated individuals.²²³ In short, morality provides the communal glue that holds our societies together.²²⁴

Eschewing morals, Chicagoans encourage “the commonly held view that the economy is dominated by greed and selfishness.”²²⁵ However, recent interdisciplinary research has “revealed that most economic exchange, whether with strangers or known individuals, relies on character values such as honesty, trust, reliability, and fairness.”²²⁶ Therefore, markets are necessarily “[m]oral in two senses.” First, moral behavior is necessary for exchange in moderately regulated markets, for example, to reduce cheating without exorbitant transaction costs. Second, market exchange itself can also lead to an “understanding of fair exchange and in this way build social capital in non-market settings.”²²⁷ Indeed, “free exchange is as much an enabler of moral growth and development as it is a negative influence upon it.”²²⁸

Chicagoans point to Adam Smith’s *Wealth of Nations* as an “uncompromising defense of unfettered competition and the free enterprise system.”²²⁹ But this approach “ignore[s] [Smith’s] *The Theory of Moral Sentiments* and its central thesis—never abandoned in the economic theory of *Wealth of Nations*—that people are naturally cooperative and sympathetic, and that their self-interest naturally includes concern for others and their opinions.”²³⁰

CLASSIC AND CONTEMPORARY READINGS, *supra* note 30, at 452, 452 (basing his argument on individual, rather than group, selection in order to focus on reciprocity).

223. See Henrich et al., *supra* note 161, at 1484 (noting that human social complexity involves “exchange and interaction . . . beyond local networks of durable kin and reciprocity-based relationships”).

224. See FUKUYAMA, *supra* note 21, at 6 (“[H]uman beings are *by nature* social creatures, whose most basic drives and instincts lead them to create moral rules that bind themselves together in communities.”). Fukuyama adds, “There have been important recent advances in the life sciences, which have the cumulative effect of reestablishing the classical view that human nature exists and that their nature makes humans social and political creatures with great capabilities for establishing social rules.” *Id.* at 138; see also WILSON, *supra* note 208, at 151 (“Moral reasoning is not a cultural artifact invented for convenience. It is and always has been the vital glue of society, the means by which transactions are made and honored to ensure survival.”).

225. Zak, *supra* note 19, at xvi.

226. *Id.* at xvii.

227. *Id.*

228. William D. Casebeer, *The Stories Markets Tell: Affordances for Ethical Behavior in Free Exchange*, in MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY, *supra* note 19, at 3, 10–11 (emphasis omitted).

229. SOLOMON, *supra* note 211, at 86.

230. *Id.* As stated by biologist Ursula Goodenough, “[E]mergent from our sense of compassion, in mortal conflict with our insistent sense that we should win, is our haunting sense that things should be fair.” URSULA GOODENOUGH, *THE SACRED DEPTHS OF NATURE* 115

There is nothing in Smith's work that would even for a moment suggest that "greed is good," and the "invisible hand" metaphor—upon which such an enormous weight has been placed despite the fact that Smith mentions it *only once* in *Wealth of Nations*—plays a much smaller role in Smith's view of the market and morality than is usually implied.²³¹

For Smith, "self-interest must always be kept in balance with benevolence and other moral sentiments."²³² Thus, it seems that Adam Smith, were he alive today, would agree that the antitrust laws should not be based solely on economic measurements but also on moral and political judgment.²³³

Many conservative scholars have begun to recognize the evolutionary importance of morals. For example, drawing on the social and biological sciences, conservative political scientist James Q. Wilson echoes evolutionary biologists in arguing that "people everywhere have a natural moral sense that is not entirely the product of utility or convention."²³⁴ Like numerous evolutionary biologists, Wilson

(1998).

231. SOLOMON, *supra* note 211, at 86. Solomon adds, "Smith has nothing good to say about greed, even as a means much less as an end, nor would he recognize much less endorse the 'greed is good' philosophy that has recently come to caricature the workings of the market and taken on all the attributes of a virtue." *Id.* at 86–87. Solomon further argues, "Smith certainly never meant to celebrate greed as such. . . . The goal of the industrialist and the businessman was to be a gentleman, and not just wealthy." *Id.* at 87; *see also* JONATHAN B. WIGHT, SAVING ADAM SMITH: A TALE OF WEALTH, TRANSFORMATION, AND VIRTUE 275–76 (2002) ("Adam Smith valued his *Theory of Moral Sentiments* (TMS) over his *Wealth of Nations* (WN) Smith meticulously revised, expanded, and reissued TMS through six editions . . .").

232. SOLOMON, *supra* note 211, at 87.

In 1759, Smith began his book *The Theory of Moral Sentiments* by pointing to the natural human capacity for sympathy as the root of all morality. No matter how selfish human beings may be, Smith declared, there is a natural sentiment of sympathy by which they share in the feelings of others, so that they feel pleasure in the joys of others and pain in their sufferings. The virtuousness or viciousness of conduct is determined by whether our sentiment of sympathy leads us to approve or disapprove of the conduct. . . . From these moral sentiments, we derive the general rules of justice and injustice.

Larry Arnhart, *Darwinian Conservatism*, in PHILOSOPHY AFTER DARWIN: CLASSIC AND CONTEMPORARY READINGS, *supra* note 30, at 349, 349–50.

233. *See* Richard Hofstadter, *What Happened to the Antitrust Movement*, in THE BUSINESS ESTABLISHMENT 113, 149 (Earl Frank Cheit ed., 1964) (noting that U.S. antitrust enforcement is based on "political and moral judgment" and not an "outcome of economic measurement"); *see also* DE WAAL, *supra* note 18, at 222 ("Smith frequently mentioned honesty, morality, sympathy, and justice, seeing them as essential companions to the invisible hand of the market."); WIGHT, *supra* note 231, at 52–53, 278–79 (noting how Smith believed that in order to survive, economic freedom needs morals).

234. JAMES Q. WILSON, ON CHARACTER: ESSAYS 192 (expanded ed. 1995) [hereinafter WILSON, CHARACTER]. *See generally* JAMES Q. WILSON, THE MORAL SENSE (1993) (identifying the natural moral sense that is shared by humans and describing the social, biological,

believes that our moral sentiments “constitute the fundamental glue of society, a glue with adhesive power that is imperfect but sufficient to explain social order to some degree.”²³⁵ Therefore, conservatives and liberals alike should welcome the imminent extinction of the amoral *Homo economicus*.

A frightening “lack of moral purpose” has been a fundamental problem in our recent economic debacles.²³⁶ Chicagoans overlook that this lack of moral purpose can lead “to a phenomenon neglected by Schumpeter but feared by the ‘old’ industrial organization economists—a tendency for dynamic competition to destroy competitive structure.”²³⁷

In counseling us that “[f]alse positives should be handled by grouping raising rivals’ costs with predation into the set of practices governed by a wait-and-see attitude,”²³⁸ Chicagoans have lured us into rationalizing dangerous and unethical predatory behavior.²³⁹ Under such conditions, predatory and “dishonest behavior can be contagious,”²⁴⁰ as

and evolutionary origins of that moral sense).

235. WILSON, CHARACTER, *supra* note 234, at 192. For interesting reviews of Professor Wilson’s *Moral Sense* theories by a fellow political scientist and a zoologist respectively, see RIDLEY, *supra* note 18, at 143 (“Wilson chides philosophers for not taking seriously the notion that morality resides in the senses as a set of purposive instincts . . . [and] argues that morality is no more a convention than other sentiments such as lust or greed. When a person is disgusted by injustice or cruelty he is drawing upon an instinct, not rationally considering the utility of the sentiment, let alone simply regurgitating a fashionable convention.”); Arnhart, *supra* note 232, at 351–52 (explaining how Wilson’s reasoning is drawn from “contemporary psychology and the social sciences generally”).

236. See, e.g., WILLIAM DAMON, THE MORAL ADVANTAGE: HOW TO SUCCEED IN BUSINESS BY DOING THE RIGHT THING 153 (2004) (describing the lack of moral purpose endemic in recent accounting scandals); FRANK PARTNOY, INFECTIOUS GREED: HOW DECEIT AND RISK CORRUPTED THE FINANCIAL MARKETS 188 (2009) (describing how Alan Greenspan testified before the Senate Banking Committee that “[a]n infectious greed seemed to grip much of our business community”).

237. Richard R. Nelson, *Comments on a Paper by Posner*, 127 U. PA. L. REV. 949, 952 (1979).

238. Easterbrook, *Exclusionary Conduct*, *supra* note 48, at 358.

239. See, e.g., Kurt Baier, *Egoism*, in A COMPANION TO ETHICS, *supra* note 42, at 197, 198 (“Since egoistic behavior is morally disapproved of, people may wish to conceal their real, egoistic, motivation and to persuade us that their behavior really was non-egoistically motivated.”); Francesca Gino et al., *Contagion and Differentiation in Unethical Behavior: The Effect of One Bad Apple on the Barrel*, 20 PSYCHOL. SCI. 393, 393 (2009) (“Previous research has shown that when the categorization of a particular behavior is not clear-cut, people can, and in fact often do, categorize their own actions in positive terms, avoiding negative updating to their moral self-image.”).

240. Gino et al., *supra* note 239, at 398. Or in the words of M. J. Comer, “Fraud is contagious and corrosive and if supposedly small frauds are allowed to escape unpunished they will soon grow.” MICHAEL J. COMER, CORPORATE FRAUD 15 (3d ed. 1998); see also den Nieuwenboer & Kaptein, *supra* note 214, at 133–34 (“[O]rganizational degradation processes may grow in scale

“[r]ationalizations serve to neutralize the stigma associated with unethical behavior, making it easier and more acceptable to perform the same transgression again.”²⁴¹ We need explicit ethical codes to rein in the inexorable temptations in business to win by any means possible.²⁴² Unfortunately, it is not fashionable today in antitrust or economics to discuss moral philosophy.²⁴³

Evolutionary biology and ethics strongly counsel that “[e]fforts to derogate strategic behavior have . . . been overdone.”²⁴⁴ It is therefore time to return to a morality-based understanding and enforcement of our antitrust laws. As Fukuyama aptly observes, “[T]he substantive findings from biology in many ways undermine many of the behavioral premises of economics.”²⁴⁵ Only through such a morals-based evolutionary biology and ethics approach can we hope to emphasize that we will not tolerate anticompetitive actions that trammel the competitive process.²⁴⁶

C. The Evolutionary Importance of Fairness and Reciprocity

If ethics and morality provide “the glue that keeps our species, over the long haul, from destroying itself,”²⁴⁷ then fairness and reciprocity²⁴⁸

over time[, and] [d]ownward spirals are defined as self-sustaining deterioration processes of one or more organizational factors that increasingly intensify the scale of corruption.”). Similarly, in his *Theory of Moral Sentiments*, Adam Smith observed that “the candidates for fortune too frequently abandon the path of virtue.” ADAM SMITH, *THE THEORY OF MORAL SENTIMENTS* 88 (Henry G. Bohn 1853) (1759).

241. Balch & Armstrong, *supra* note 213, at 294. The authors further observed that “Microsoft seemed to be tangled in rationalizations.” *Id.* at 298.

242. *See id.* at 295 (“Without explicitly stated ethical codes, there is little hope of consistent ethical behavior in a sizable organization.”).

243. *See* Michael Ruse & Edward O. Wilson, *Moral Philosophy as Applied Science*, in *PHILOSOPHY AFTER DARWIN: CLASSIC AND CONTEMPORARY READINGS*, *supra* note 30, at 365, 376 (“No major subject is more important or relatively more neglected at the present time than moral philosophy.”).

244. Oliver E. Williamson, *Delimiting Antitrust*, in *REVITALIZING ANTITRUST IN ITS SECOND CENTURY: ESSAYS ON LEGAL, ECONOMIC, AND POLITICAL POLICY*, *supra* note 15, at 211, 236.

245. FUKUYAMA, *supra* note 21, at 161–62.

246. *See* ADAMS & BROCK, *supra* note 15, at 139 (citing *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 35 (D.D.C. 2000) (conclusions of law), *aff’d in part, rev’d in part*, 253 F.3d 34 (D.C. Cir. 2001); *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 12 (D.D.C. 1999) (findings of fact)).

247. MICHAEL S. GAZZANIGA, *THE ETHICAL BRAIN* 171 (2005); *see also* VERMEIJ, *supra* note 9, at 55–57 (“Besides the capacity for intelligent design, humans have culturally evolved an elaborate system of ethics and morality, a code of individual and collective conduct. . . . What sets human codes of ethics and morality apart from the behavior of other animals is that, at their best, they allow people who are not closely related to each other to cooperate and live in peace The social contracts represented by legal codes and by systems of ethical and moral behavior enable humans to make decisions and policies with long-range benefits and not simply to favor short-term gains.”). *See generally* LEAKEY & LEWIN, *supra* note 220, at 358 (arguing that

are the vital ingredients of that evolutionary glue.²⁴⁹ In the words of zoologist Matt Ridley: “Fairness matters.”²⁵⁰ Study after study has confirmed that humans value fairness in their social and economic relationships, and the parameters of that fairness are set by our cultures.²⁵¹

Neoclassical economics “has nothing to say about fairness,” except that a free market will lead to allocative efficiency and maximum utility.²⁵² “However many articles there have been on fairness, and however important economists may consider fairness, it has been continually pushed into a back channel in economic thinking. . . . But fairness may be just as important as the economic motivations that are

qualities such as compassion and morality “are the threads that hold social fabric together”); WILSON, *supra* note 208, at 151 (calling moral reasoning the “vital glue” of society).

248. See Ursula Goodenough, *Naturalizing Morality*, in BIODIVERSITY AND THE LAW: INTELLECTUAL PROPERTY, BIOTECHNOLOGY AND TRADITIONAL KNOWLEDGE 35, 35–37 (Charles McManis ed., 2007) (arguing that the goal of morality is to “generate flourishing communities” and that six moral capacities strengthen this goal, “namely: strategic reciprocity, humaneness, fair-mindedness, courage, reverence and mindfulness”).

249. See RIDLEY, *supra* note 18, at 136–37 (“Emotions elicit reciprocity in our species, . . . [and] moralistic aggression serves to police fairness in reciprocal exchanges—people seem to be inordinately upset by ‘unfair’ behaviour.”); see also BEINHOCKER, *supra* note 5, at 121 (“Humans have strongly ingrained rules about fairness and reciprocity that override calculated ‘rationality.’”); Frans B. M. de Waal, *How Selfish an Animal? The Case of Primate Cooperation*, in MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY, *supra* note 19, at 63, 70 (“During the evolution of cooperation, it may have become critical for parties to compare their own efforts and payoffs with those of others. Cooperative animals seem guided by a set of expectations about the outcome of cooperation and access to resources.”).

250. See RIDLEY, *supra* note 18, at 136 (pointing to psychological experiments finding that humans value reciprocity).

251. See, e.g., Marc D. Hauser, MORAL MINDS: HOW NATURE DESIGNED OUR UNIVERSAL SENSE OF RIGHT AND WRONG 84 (2006) (“These simple economic games suggest that fairness is a universal principle with parameters set, presumably in early development, by the local culture.”); MELVIN KONNER, THE TANGLED WING: BIOLOGICAL CONSTRAINTS ON THE HUMAN SPIRIT 427–28 (1982) (discussing arguments that humans have a built-in predisposition toward certain ethical values); Sarah F. Brosnan, *Fairness and Other-Regarding Preferences in Nonhuman Primates*, in MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY, *supra* note 19, at 77, 79 (“Few would disagree that humans have a sense of fairness. We respond badly when treated unfairly; we give more than the minimum required in experimental games.”); Michael Ruse, *Evolution and Ethics*, in MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY, *supra* note 19, at 489, 501 (“Today’s most eminent neo-Kantian moral philosopher has made a whole system out of fairness, and it is just the sort of system favored and expected by the evolutionist. . . . [I]t seems to me that this is just the kind of set-up that our genes would favor.”).

252. AKERLOF & SHILLER, *supra* note 19, at 19–20 (quoting Albert Rees, *The Role of Fairness in Wage Determination*, 11 J. LAB. ECON. 243, 243–44 (1993)).

given prime time.”²⁵³ Behavioral studies consistently have shown “that considerations of fairness can override economic motivation.”²⁵⁴

Economists typically cite game theory to justify their model of the rational utility-maximizing *Homo economicus*. However, “[o]ne lesson that may flow from the evolutionary and psychological study of altruism is that true prisoners’ dilemmas are in fact rarer than many researchers suppose.”²⁵⁵ In fact, there is far more altruism and reciprocity in sophisticated game theory studies than anticipated. Studies have shown that

[h]umans have strongly ingrained rules about fairness and reciprocity that override calculated “rationality.” . . . [H]umans are “conditional cooperators” who will behave generously as long as others are doing so, and “altruistic punishers” who will strike back at those perceived to behave unfairly, even at the expense of their own immediate interests.²⁵⁶

Homo reciprocans consequently presents a more realistic and biologically correct behavioral model than *Homo economicus*.

What does this all mean for antitrust? “The most important take-home message from the data presented . . . is that fairness counts.”²⁵⁷ Fairness, reciprocity, and trust allow society to function without repeated inefficient and costly breakdowns. “Trust is as vital a form of social capital as money is a form of actual capital.”²⁵⁸ “Trust is the expectation that arises within a community of regular, honest, and cooperative behavior, based on commonly shared norms, on the part of

253. *Id.* at 20.

254. *Id.* at 22.

255. Elliot Sober & David Sloan Wilson, *Unto Others*, in PHILOSOPHY AFTER DARWIN: CLASSIC AND CONTEMPORARY READINGS, *supra* note 30, at 433, 450.

256. BEINHOCKER, *supra* note 5, at 121 (quoting Herbert Gintis et al., *Moral Sentiments and Material Interests: Origins, Evidence, and Consequences*, in MORAL SENTIMENTS AND MATERIAL INTERESTS: THE FOUNDATIONS OF COOPERATION IN ECONOMIC LIFE 3, 31 (Herbert Gintis et al. eds., 2005)); *see also* AKERLOF & SHILLER, *supra* note 19, at 23 (“[S]ubjects were willing to pay to punish those who acted selfishly, even though there was an individual cost to inflict such punishments. Interestingly, they also found that the possibility of punishment greatly reduced selfish behavior.”); WILSON, *supra* note 208, at 151 (finding that every society is undergirded by ethical principles); Henrich et al., *supra* note 161, at 1480 (concluding that market integration in diverse populations “positively covaries with fairness while community size positively covaries with punishment”).

257. Brosnan, *supra* note 251, at 99. “Human beings will produce moral rules for themselves, partly because they are designed by nature to do so and partly as a result of their pursuit of self-interest.” FUKUYAMA, *supra* note 21, at 250.

258. RIDLEY, *supra* note 18, at 250. Ridley adds, “Some economists have long recognized this. ‘Virtually every commercial transaction has within itself an element of trust,’ says the economist Kenneth Arrow.” *Id.*

other members of that community.”²⁵⁹ “[W]hile contract and self-interest are important sources of association, the most effective organizations are based on communities of shared ethical values.”²⁶⁰ In the words of biologist Edward O. Wilson, “[W]e are learning the fundamental principle that ethics is everything.”²⁶¹

Chicagoans fundamentally overlook that societal trust is corrosively eroded by the selfishness that *Homo economicus* wears as a badge of honor. If people and corporations can be counted on to “honor norms of reciprocity[] and avoid opportunistic behavior,” then we “will be able to achieve common [economic] purposes more efficiently.”²⁶² This is not a naïve formula for lessening competition. Rather, it is a prescription to focus on ways to create better and more innovative products at a lower cost rather than resorting to predatory practices to harm competitors.²⁶³

The rise of *Homo economicus* is synonymous with and symptomatic of the insidious increase in America of “moral minimalism,” which has led to a dangerous “miniaturization of community.”²⁶⁴ For our competitive capital system to thrive as an evolutionary economic ecosystem, consumers and businesspersons must be able to trust that their suppliers, customers, and competitors will generally behave fairly and morally.²⁶⁵ The antitrust laws provide a flexible framework that helps nourish and protect such trust.²⁶⁶ “A world without obligations to reciprocate, deal fairly and trust other people would be simply inconceivable.”²⁶⁷

259. FUKUYAMA, *supra* note 115, at 26.

260. *Id.*

261. WILSON, *supra* note 1, at 325.

262. FUKUYAMA, *supra* note 21, at 49.

263. See Elhauge, *supra* note 180, at 256 (questioning economic benefits of impairing rival efficiency).

264. See FUKUYAMA, *supra* note 21, at 91 (“The essence of the shift in values that is at the center of the Great Disruption is, then, the rise of moral individualism and the consequent miniaturization of community.”); Wendell Berry, *Faustian Economics*, in THE BEST AMERICAN SCIENCE AND NATURE WRITING 2009, *supra* note 71, at 1, 3 (“The normalization of the doctrine of limitlessness has produced a sort of moral minimalism: the desire to be efficient at any cost, to be unencumbered by complexity.”).

265. Nobel Prize winning economist Joseph E. Stiglitz argues, “The model of rugged individualism combined with market fundamentalism has altered not just how individuals think of themselves and their preferences but how they relate to each other. In a world of rugged individualism, there is little need for community and no need for trust.” STIGLITZ, *supra* note 28, at 289.

266. See, e.g., Fox, *supra* note 197, at 919 (“The members of the New Coalition take account of the real history of antitrust: concern for consumers; concern for the ‘little man’; interest in access, diversity, and pluralism; and condemnation of coercion and exploitation.”).

267. RIDLEY, *supra* note 18, at 143.

But, Chicagoans ask, how can we possibly regulate fairness without harming competition?²⁶⁸ Moreover, why should we worry, since “false negatives take care of themselves as entry occurs[?]”²⁶⁹ An initial answer is that the monopolist’s or dominant firm’s temptation to cheat or “free-ride” on our moral system of trust threatens the very foundations of our economic system.²⁷⁰

The human brain has evolved masterful abilities to calculate fairness.²⁷¹ Parallel with this evolution, we have developed keen abilities to detect cheating.²⁷² The antitrust laws enable us to punish cheaters without resorting to violence, as we almost certainly would in a “free market.” Our antitrust laws therefore are consistent with models that show that punishing cheaters is critical to maintaining long-term cooperation.²⁷³

Humans have not evolved in a system of maximum individual freedom and self-interest. Rather, “[e]volution represents freedom within constraints.”²⁷⁴ Given our evolutionary and economic success,

268. See, e.g., Easterbrook, *Exclusionary Conduct*, *supra* note 48, at 357–58 (arguing that predation and exclusionary conduct should be “governed by a wait-and-see attitude” because the economic costs of false positives are so high).

269. *Id.*; see also Schumpeter, *supra* note 49, at 30–31 (arguing that the competitive market “will in the long run enforce behavior very similar to the perfectly competitive pattern,” and that “restrictive practices” are “transient by nature” and “may do much to steady the ship and to alleviate temporary difficulties”). An evolutionary economist might wish to ask Schumpeter why a firm that cannot survive without resort to “restrictive practices” should be protected in a system of “survival of the fittest.”

270. MAXWELL, *supra* note 209, at 55 (“The fact that the original object of moral feelings was the monitoring of social transactions [] helps explain why we have so much concern about fairness.”).

271. See WILSON, *supra* note 1, at 186–87; WILSON, *supra* note 208, at 151 (“[P]sychologists . . . have discovered a hereditary tendency to detect cheaters and to respond to them with intense moral outrage.”).

272. See, e.g., WILSON, *supra* note 208, at 151. Wilson observes:

[O]ne capacity, the detection of cheating, is developed to exceptional levels of sharpness and rapid calculation. . . . More than error, more than good deeds, and more even than the margin of profit, the possibility of cheating by others attracts attention. It excites emotion and serves as the principal source of hostile gossip and moralistic aggression by which the integrity of the political economy is maintained.

Id. at 172; see also FUKUYAMA, *supra* note 21, at 184–85 (“In the real world, cheating is never an emotionally or morally neutral choice. Almost every language is full of pejorative terms for defectors, like traitor, scab, ingrate, and turncoat.” (emphases omitted)).

273. See, e.g., Jane Mansbridge, *Public Spirit in Political Systems*, in *VALUES AND PUBLIC POLICY* 146, 165 (Henry J. Aaron et al. eds., 1994) (“The cultural arrangements of human beings, including our political arrangements, are our primary mechanisms for promoting collective survival and prosperity in the face of individual incentives for narrow self-interest. These cultural arrangements depend . . . not only on efficient arrangements for monitoring and sanctioning defection but equally critically on public spirit.”).

274. WESSON, *supra* note 128, at 171.

our “principal problem [today] is self-restraint.”²⁷⁵ There has been too much focus in economics and antitrust on the supposedly logical *Homo economicus* and not enough on the emotional biological humans of the real world.²⁷⁶ While we have naturally evolved selfish and aggressive sides, “conceiving of ethics as human ecology gives us reason to moderate these tendencies.”²⁷⁷

In the end, “*Homo economicus* is a sociopath”²⁷⁸ whose selfishness and greed are rationalized and encouraged by Chicagoans. He epitomizes “[t]he first, most obvious design error in the human moral system, [which] is simply the option of deviance: individuals can opt to deviate from the rules of society.”²⁷⁹ *Homo economicus* “does not worry about morality, ethics, or other people. Instead, [he] is cold and calculating, worries only about himself, and pursues whatever course brings him the greatest material advantage.”²⁸⁰ Unfortunately, such a model inevitably leads to business ethics programs that “begin with the cynical assumption that cheating and lying are tempting because they really do help people get ahead in business; and . . . compartmentalize ethics into a list of cautionary do’s and don’ts that have nothing to do with the aspirations that most strongly drive business people.”²⁸¹

Neoconservative Chicagoans belittle our antitrust laws as a policy allegedly “at war with itself.”²⁸² But evolutionary biology and ethics—not to mention history—show why this must be so. As discussed,

275. *Id.* at 258.

276. See ARNE Næss, LIFE’S PHILOSOPHY: REASON AND FEELING IN A DEEPER WORLD 51 (2002) (arguing that science and philosophy have focused their inquiries disproportionately on the “logical, and not the emotional man”).

277. OWEN FLANAGAN, THE PROBLEM OF THE SOUL: TWO VISIONS OF MIND AND HOW TO RECONCILE THEM 292 (2002).

278. Lynn A. Stout, *Taking Conscience Seriously*, in MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY, *supra* note 19, at 157, 158–59. Stout adds, “The hallmark of sociopathy is extreme selfishness as shown by a willingness to lie, cheat, take advantage, [and] exploit.” *Id.* at 159 (quoting BENJAMIN WOLMAN, THE SOCIOPATHIC PERSONALITY 42 (1987)).

279. MAXWELL, *supra* note 209, at 7.

280. Stout, *supra* note 278, at 158.

281. DAMON, *supra* note 236, at 108. The sociologist Amitai Etzioni has observed:

[B]usiness educators feel uncomfortable discussing fundamental moral issues in their classrooms. They wonder whether they may be putting their students at a disadvantage by urging them to adopt ethical restrictions on their competitive drives. [Indeed, w]hen the Harvard Business School introduced a mandatory ethics requirement in the late 1980s, “reactions ranged from disgust to outright hostility.”

Id. (quoting Amitai Etzioni, *When It Comes to Ethics, B-Schools Get an F*, WASH. POST, Aug. 4, 2002, at B4).

282. Tony Freyer, *The Sherman Antitrust Act, Comparative Business Structure, and the Rule of Reason: America and Great Britain, 1880–1920*, 74 IOWA L. REV. 991, 1016 (1989) (discussing the inner conflict of antitrust laws).

throughout our history, we always have had to balance our innate aggressive tendencies with our social morals and senses of fairness and reciprocity. We also have had to enforce and support our moral standards through an evolved ability to detect and willingness to punish cheaters. The flexibility of the antitrust laws reflects an enlightened effort to balance our darker and moral sides through rules that allow aggressive competition on a fair and level playing field.

The Chicagoans and *Homo economicus*, on the other hand, have created models and policies that are at war with reality and at odds with fundamental human nature. The coming extinction of *Homo economicus* and the eclipse of the Chicago School of antitrust are therefore timely and welcome. It is time to turn away from “atomistic individualism, [which] is not only inaccurate in the face of the corporate complexity of today’s business world; [but] naïve.”²⁸³ We need to recognize that our future economic adaptability and long-term success must be directly tied to our evolutionary foundation of shared morals and ethics.

Returning to an antitrust policy that recognizes and incorporates the fundamental human values of fairness and reciprocity will not only enhance our foundations of economic trust but will ultimately create a more stable, more healthy, and more efficient economic ecosystem.²⁸⁴ As paleontologist Stephen Jay Gould has noted, “Complex systems improve when the best performers play by the same rules over extended periods of time.”²⁸⁵ Our value systems of ethics, morals, and fairness are not perfect, but evolutionary “[a]daptations are rarely perfect.”²⁸⁶ In

283. Robert C. Solomon, *Business Ethics*, in A COMPANION TO ETHICS, *supra* note 42, at 354, 358 (“However competitive a particular industry may be, it always rests on a foundation of shared interests and mutually agreed-upon rules of conduct, and the competition takes place not in a jungle but in a community, which it presumably both serves and depends upon.”); *see also* STEPHEN L. CARTER, CIVILITY: MANNERS, MORALS, AND THE ETIQUETTE OF DEMOCRACY 278 (1998) (“[W]e who fancy ourselves more civilized may go too far in the other direction, insisting on an individualism so stultifying that to talk about community or obligation is almost to state an evil.”).

284. Robert Wesson argues, “If there is to be a next stage for humanity, it has to rest on new, broader, more humane values, in dedication to common needs of this possibly imperiled species.” WESSON, *supra* note 128, at 290.

285. GOULD, *supra* note 71, at 112. As Gould notes, professional baseball offers a remarkable example of a well-played highly competitive game with reasonable rules subject to minimal oversight. The system has pushed excellence in baseball closer and closer to humans’ innate limitations. *Id.*; *see also* Tracy L. Meares, *Everything Old is New Again: Fundamental Fairness and the Legitimacy of Criminal Justice*, 3 OHIO ST. J. CRIM. L. 105, 108 (2005) (“[F]air process norms . . . can lead to instrumental benefits.”).

286. Ruse, *supra* note 251, at 502–03.

any event, these value systems are far superior to the unrealistic and values-driven neoclassical economic models currently in vogue.

V. CONCLUSION

Evolutionary biology provides valuable insights for analyzing structural and behavioral antitrust issues. From a structural perspective, diversity, variation, and multiplicity are crucial to maintaining a stable and efficient competitive economic system. Dominant firms and monopolies are overrated in terms of their overall efficiency and positive impacts on our economic system, while their dangerous negative propensities are vastly underrated. Antitrust regulators and the courts should not, therefore, be reluctant or afraid to block mergers between substantial competitors or to break-up monopolies.²⁸⁷ In nearly all cases, the additional actual and potential competition and economic diversity will provide a net positive for the overall economic system's long-term health and stability.²⁸⁸ Although Chicagoans argue that structural remedies "will create market inefficiencies,"²⁸⁹ it is important to recognize that "[b]etween 1980 and 2005, virtually all new jobs created by firms in the [United States] were created by firms that were 5 years old or less."²⁹⁰

287. See, e.g., *United States v. E. I. DuPont de Nemours & Co.*, 366 U.S. 316, 333–35 (1961) (requiring divestiture by DuPont of General Motors stock, and observing "that once the Government has successfully borne the considerable burden of establishing a violation of law, all doubts as to the remedy are to be resolved in its favor"); Kovacic, *supra* note 151, at 1150 ("[T]he powerful symbolic value inherent in the deconcentration vision ensures that other antitrust policymakers will embrace it in the Sherman Act's second century."); Stigler, *supra* note 15, at 12 ("No such drastic and ominous remedy as the central direction of economic life is necessary to deal with the problems raised by big business. The obvious and economical solution . . . is to break up the giant companies."); Spencer Weber Waller, *The Past, Present, and Future of Monopolization Remedies*, 76 ANTITRUST L.J. 11, 15 n.20 (2009) ("[D]ivestiture in merger cases does provide important lessons that should be applied in restructuring relief in Section 2 cases.").

288. See, e.g., GOULD, *supra* note 123, at 307 (describing from a biological standpoint how certain traits will perpetuate a species despite mass extinction, and pointing out that those traits cannot be predicted); HÖLDOBLER & WILSON, *supra* note 83, at 423 ("[I]mpoverished faunas promote dominant species[, and] the fewer the ant species in a local community, the more likely the community is to be dominated behaviorally by one or a few species with large, aggressive colonies that maintain absolute territories."); Horton, *supra* note 2, at 213 ("The creation of efficiencies through sheer size or dominance is vastly overrated, especially when we recognize in science, dominant species often are found in impoverished ecosystems.").

289. See Barnett, *supra* note 59, at 39 (opining that structural remedies should be used "sparingly").

290. Thomas L. Friedman, Op-Ed., *Start-Ups, Not Bailouts*, N.Y. TIMES, Apr. 3, 2010, at WK9 (quoting Robert Litan of the Kauffman Foundation, which specializes in promoting innovation in America). David Brooks adds, "The free-market revolution didn't create the pluralistic decentralized economy. It created a centralized financial monoculture, which requires a gigantic government to audit its activities." David Brooks, Op-Ed., *The Broken Society*, N.Y. TIMES, Mar. 18, 2010, at A25. But see HEILBRONER & THUROW, *supra* note 218, at 171 ("[T]he

From a behavioral antitrust perspective, the evolution of morality, ethics, fairness, and reciprocity has been crucial to our ability to build and maintain a complex competitive free-enterprise economy. In order to best protect that economy, policy-makers should increasingly look to the evolutionary moral values of fairness and reciprocity in analyzing and punishing predatory and exclusionary acts by dominant firms and monopolists, and stop unsuccessfully trying to rely upon inflexible quantitative models to justify dangerous predatory economic behavior.

As part of this approach, we should start returning behavioral antitrust cases to jurors, who have evolved the ability to critically evaluate fairness, determine intent, and detect cheating. We should also return to focusing on justiciable and telling evidence such as intent, purposefulness, and fairness, which can be appropriately processed and evaluated by jurors.²⁹¹ Let jurors—rather than judges constrained by technical analyses and captured by the economic theories before them—apply our societal moral and ethical value systems to judge unfair anticompetitive behavior.

In conclusion, evolutionary biology counsels that it is time to stop blindly following *Homo economicus* and the Chicago School, stop protecting dominant and monopolistic competitors through the framing of ambiguous and speculative “efficiencies,” and return to protecting the long-term evolutionary health and stability of our competitive free-enterprise system.

assertion that most of the jobs in America are being created by small businesses and that, as a result, such business should be seen as the engines of national economic success . . . [is] neither factually correct nor economically true.”).

291. See Kahn, *supra* note 120, at 144–45 (describing historical developments in antitrust law and calling for a “reorientation of antitrust policy”); *id.* at 161–62 (“The inescapable conclusion is that, from a practical standpoint, the criterion of intent alone ‘fills the bill’ for a sensible antitrust policy in such cases . . . [if] accompanied, first, by the power to restrain or exclude, and, second, by some evidence that the power has been or, barring interference, will be exercised.”). It is reasonable to ask why so many Chicagoans fear antitrust juries. Perhaps we should “return here to Classical Athens in its democracy and reflect a little on how it might have dealt with the [] issue.” HOFFMAN, *supra* note 7, at 216. In Pericles’ funeral oration, as reported by Thucydides, he noted:

Our ordinary citizens, though occupied with the pursuits of industry, are still fair judges of public matters; for, we alone regard the man who takes no part in public affairs not as one who minds his own business but as good for nothing. We Athenians are able to judge all events, and instead of looking on discussion as a stumbling block in the way of action, we think it an indispensable preliminary to any wise action at all.

THUCYDIDES, THE PELOPONNESIAN WAR 105 (John H. Finley, Jr. trans., 1942). As Roald Hoffman aptly notes, “It is clear that the citizens of the city-states of Greece felt themselves able to judge, no matter how technical the matter.” HOFFMAN, *supra* note 7, at 216.