

6-2009

Adaptive Policymaking: Evolving and Applying Emergent Solutions for U.S. Communications Policy

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Recommended Citation

Whitt, Richard S. (2009) "Adaptive Policymaking: Evolving and Applying Emergent Solutions for U.S. Communications Policy," *Federal Communications Law Journal*: Vol. 61: Iss. 3, Article 2.
Available at: <http://www.repository.law.indiana.edu/fclj/vol61/iss3/2>

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Adaptive Policymaking: Evolving and Applying Emergent Solutions for U.S. Communications Policy

Richard S. Whitt*

“All we know of the world is of the nature of theories, and all experience can do is to change those theories.” - F.A. Hayek

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* Mr. Whitt currently is Washington Telecom and Media Counsel at Google Inc. This Article solely reflects his personal views, and not necessarily those of Google. The author would like to thank the participants at the 2008 Wharton School Communications Colloquium, especially Kevin Werbach, Brett Frischmann, and Barbara Cherry, for their insightful and helpful critiques of an earlier version of this paper. All remaining flaws are mine alone.

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I. INTRODUCTION

If nothing else, the global financial disasters of 2008-09 demonstrate that there is no such thing as a “free market.” When equipped with the proper institutions and organizations, and generating mutual trust through transparency and accountability, markets can achieve tremendous material success, in terms of innovation, economic growth, and a host of other emergent benefits. When such ground rules and players are lacking, or even abandoned, markets can and do degenerate into chaos. What is true for the financial sector is equally true for other economic markets, if not to such visibly dramatic effects: we all pay a substantial price by failing to recognize the need to foster what more appropriately should be called “enabled markets.” Much of the formal enabling is done by government policymakers.

This Article incorporates and expands upon an earlier co-authored work on what Steve Schultze and I termed “Emergence Economics.”¹ In that paper, we explained that markets are not Platonic ideals of efficiency and equity, but the flesh-and-blood instantiation of ordinary human beings engaged in every form of commerce and other social activities.² Here I will present some specific ways that U.S. policymakers should use teachings from the latest thinking in economics to help create a conceptual framework that can be used to grapple with current controversies in communications law and regulation. In brief, those who make, implement, and enforce public policy should be obliged to understand the way that markets actually work, rather than merely assume outworn caricatures of such knowledge.

This Article is divided into four parts. First, it provides a brief overview of Emergence Economics, with an emphasis on the “rough formula” of emergence—namely, that agents plus networks plus evolution equals emergence. The market is explained as a multi-faceted, complex,

1. Richard S. Whitt & Stephen Schultze, *The New “Emergence Economics” of Innovation and Growth, and What It Means for Communications Policy*, 7 J. TELECOMM. & HIGH TECH. 217 (2009) (initial draft of manuscript available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1311904).

2. *Id.* at 223-31.

adaptive system, coevolving with the government, and a mix of social components that are human, networked, evolving, and growing. In particular, newer economic thinking demonstrates the unique role of technological change in creating and furthering innovation and economic growth, and myriad non-pecuniary “net effects.”

Second, this Article explicates the general concept of “Adaptive Policymaking” by government agents. This concept is based on the premise that economic markets, properly understood, can form part of the foundation for a framework to inform policymakers as they assess, formulate, and implement policy decisions. Some suggested guiding principles are introduced, including a preference for being cautious, macroscopic, incremental, experimental, contextual, flexible, provisional, accountable, and sustainable. This Part outlines the visible hand of government, in terms of the “public policy design space,” which includes a proposed adaptive toolkit to be used by policymakers. It also focuses on how markets rely on, and are enabled by, trust-building institutions and organizations, many of which, in turn, are crafted via the political market.

Third, this Article discusses devising a public policy design space specifically for communications policy. After proposing a policy goal of “More Good Ideas,” and the shorter-term objective of “Harnessing Communications Networks as Online Platforms,” this Part looks at some of the institutional and organizational challenges facing the FCC. Several useful adaptive tools are suggested, including conceptual metaphors, the fitness landscape, and a modular model.

Finally, this Article reintroduces a public policy framework built on the fitness landscape, premised on “enabling without dictating” evolutionary forces in the marketplace. It will explore how and why policymakers generally should refrain from “tampering” with outputs and outcomes, while considering in some situations “tinkering” with inputs—namely, by feeding the evolutionary algorithm, fostering agent connectivity, shaping the fitness landscape, and enhancing market feedback.

This treatment does not intend to provide a comprehensive theoretical overview, or definitive answers to specific policy questions, but rather to provide useful grounding for future adaptive policymaking. In *Emergence Economics*, Schultze and I showed how market systems are more rich, dynamic, and unpredictable than had been assumed by so-called “Old School Economics” and its proponents.³ Here I focus on how public officials should not only look to an expansive view of markets, but also to a more well-grounded view of policymaking. The laws, regulations, and

3. *Id.* at 224-27.

principles that we fashion should be based on considerations that extend beyond purely pecuniary economic motivations. So, markets are more complex than we thought, and public policy is about more than markets. All of this springs from myriad daily human interactions that often elude the simplistic categories of “market” or “state.”

Armed then with new insights from Emergence Economics, carefully delineated policy goals and objectives, and conceptual models such as fitness landscapes, legislators and regulators have a potential range of tailored roles to play in the public policy space. These roles should center on flexibly employing the various implements of an adaptive toolkit to examine and decide difficult issues. In particular, the four suggested “tinkering” implements—inputs, connectivity, incentives, and feedback—are key interrelated components of the toolkit. Moreover, these tools should reinforce each element of the rough formula of emergence, fostering positive emergent phenomena such as innovation, economic capital, and social production, as well as the rich “spillovers” that carry unique personal and community value.

II. THE EMERGENCE OF EMERGENCE ECONOMICS

Much of the field of economics is based on “framework, paradigms, and doctrines.”⁴ Virtually all policymakers subscribe to a particular economics doctrine, whether or not they are aware of it, and these doctrines guide their thinking and deliberations.⁵ For too long, too many U.S. policymakers have assumed that what we previously have labeled “Old School Economics”—increasingly outdated versions of economic theory still deemed to be received wisdom in the policy world—accurately represents the realities of the marketplace. As a result, current public policy discussions often are rooted in the past, in the form of significantly outdated economic and technological assumptions.

As it turns out, the rise of new economic thinking, along with emerging technology platforms culminating in the Internet, together directly challenge many of those chief assumptions. In particular, in a rapidly evolving global marketplace, ideas and innovation are the fodder that fuels a nation’s economic growth. New technologies—novel products, processes, and business plans—are the most important determinant of long-term economic growth, bringing along a raft of other personal and social benefits. The overarching lesson for policymakers is that the tools of

4. ROBERT D. ATKINSON & DAVID AUDRETSCH, INFO. TECH. & INNOVATION FOUND., ECONOMIC DOCTRINES AND POLICY DIFFERENCES: HAS THE WASHINGTON POLICY DEBATE BEEN ASKING THE WRONG QUESTIONS? 3 (2008), available at <http://www.itif.org/files/EconomicDoctrine.pdf>.

5. *Id.*

government—when employed carefully, deliberately, and in the right context—can successfully facilitate a more optimal environment for the emergence of innovative new ideas, economic growth, and human freedom.

A. *The Roots of Emergence Economics*

Emergence Economics is an umbrella term for the latest findings from a wide variety of cutting-edge schools of thought, including complexity science, behavioral economics, game theory, network science, new growth theory, and competition theory. Emergence Economics offers the promise of a well-grounded conceptual framework, a way of approaching and understanding the growth-oriented network economy being brought about by the Internet.⁶ That framework seeks neither to deterministically engineer this dynamic economy, nor to blindly assume that it is evolving toward perfect efficiency. However, with new frameworks come new ways of seeing.

Old School Economics—the hoary verities commonly presented in public policy debates—maintains, for example, that the market is linear and always seeks equilibrium, that economic actors are perfectly rational, with perfect knowledge of themselves and the marketplace, that production is generated only by capital markets or government subsidy, that growth is exogenous, and the whole of the economic system is always equal to the sum of its parts.⁷ It turns out that every one of these key assumptions is either overstated or plain wrong.⁸ Teachings from physics, biology, psychology, cognitive neuroscience, and plain common sense challenge much of the impressive intellectual edifice that has constituted Old School Economics. “The emperor of high economic theory has no clothes.”⁹

It is time for economics to regain more of its roots in the human element, and in turn, for law and policy to find their own footing in a more grounded economic framework. To some, “the ultimate accomplishment [of such a synthesis] would be to develop a theory that takes us from theories of agents, networks, and evolution, all the way up to the macro patterns we see in real-world economies.”¹⁰ While such a comprehensive theory does not yet exist, we can begin to see glimmers of what it might become. That theory would encompass macroeconomic patterns as emergent phenomena, that is, characteristics of the system as a whole that

6. For a more comprehensive overview of the following discussion, see Whitt & Schultze, *supra* note 1, at 223-50.

7. *Id.* at 219.

8. *Id.* at 224-31.

9. ROBERT H. NELSON, *ECONOMICS AS RELIGION: FROM SAMUELSON TO CHICAGO AND BEYOND* 330 (2001).

10. ERIC BEINHOCKER, *THE ORIGIN OF WEALTH* 167 (2006).

arise endogenously out of interactions between agents and their environment.

Emergence Economics, in particular, helps us understand that knowledge and technology are not just outputs from within the modern economy, but also essential inputs that drive economic growth and countless other social benefits. Further, game-changing, disruptive innovations, along with numerous smaller, incremental inventions, tend to emerge from the edges of the Internet. These innovations—which stem from both supply-side and demand-side factors—in turn create far-reaching benefits to unaffiliated entities in the form of “spillovers” and further inputs and outputs throughout the social network. This sort of edge-driven, broadly beneficial, mutually reinforcing activity thrives in an environment of open “generativity,” where no market player—whether government or firm—can unilaterally pick winners and losers.

B. *The Complexity of Our Many-Sided Markets*

1. An Emergent Economy: Smith’s “Invisible Hand”

The combined thinking behind Emergence Economics highlights often-overlooked aspects of how markets really work, and the numerous ways to look at markets based on one’s perspective. First and foremost, we live in an emergent economy. In essence, individual agents, acting through interconnected networks, engage in the evolutionary market processes of differentiating, selecting, and amplifying certain business plans and technologies, which in turn generate a host of emergent economic phenomena. This leads to the “rough formula” for emergence in a market environment: *agents + networks + evolution = emergence*.¹¹

With more modern ears, one can equate Adam Smith’s famous “invisible hand” of the market with the concept of phenomena emerging from a complex adaptive system (CAS). In particular, agents in the marketplace interact in myriad unpredictable ways to select from among different Physical Technologies (designs for working with objects), Social Technologies (methods for organizing people), and Business Plans (concrete commercial designs).¹² This coevolutionary process between people, technologies, and offerings tends to drive the most effective and meritocratic emergent solutions that best fit the current environment.

11. Whitt & Schultze, *supra* note 1, at 231. Importantly, this generic formula is not limited to economics, but can be used to describe other forms of emergence by complex adaptive systems, including activities by political and social agents.

12. *Id.* at 231-50.

Old School Economics claims that a sufficiently free market will converge on a natural equilibrium.¹³ According to this theory, each rational actor pursues its own self-interest with perfect knowledge and instant speed.¹⁴ Reality is far from this “ideal,” however, and even in the context of competitive markets, there are many possible outcomes.¹⁵ Moreover, the predicate of perfect competition leads to a steadfast belief in “the self-adjusting, self-correcting paragon of efficiency portrayed by orthodox theory.”¹⁶ Markets do not spring full-grown into the world, though, but instead are artificial constructs we design by turns to encourage and restrain our natural evolutionary impulses.¹⁷ Further, Emergence Economics has had the benefit of another one hundred years of physics theory and experimentation, as well as considerable advances in studying evolution and biological systems.¹⁸ Indeed, “[s]ocial systems exhibit dynamic patterns analogous to physical, biological, and computational systems.”¹⁹ Thanks to complexity theory, we now know that markets are dynamic, complex, non-linear, ever-evolving, imperfectly competitive, and highly unpredictable.²⁰

2. A Human Economy: Hayek’s Constrained Planners

We also live in a *human* economy. George Lakoff nicely summarizes the latest teachings on human rationality from neuroscience and behavioral psychology:

Reason is commonly assumed to be conscious; disembodied; dispassionate; literal (fits the world directly); logical (leads from facts to correct conclusions); universal; and self-interested. The cognitive and brain sciences have shown that reason really is mostly unconscious; physical (uses the brain); requires emotion; uses frames, metaphors, and melodramatic narratives; varies depending on

13. *Id.* at 224-25.

14. *Id.* at 224-31.

15. For a timely critique of this aspect of Old School Economics, see RICHARD BOOKSTABER, *A DEMON OF OUR OWN DESIGN: MARKETS, HEDGE FUNDS, AND THE PERILS OF FINANCIAL INNOVATION* 207-41 (2007) (detailing numerous flaws in the “perfect market paradigm.”).

16. JAMES CASE, *COMPETITION* 220 (2007).

17. Whitt & Schultze, *supra* note 1, at 55-56.

18. *Id.* at 7. Brian Arthur and others observe that six features of the market, and other complex adaptive systems—dispersed interaction, no global controller, cross-cutting hierarchical organization, continual adaptation, perpetual novelty, and out-of-equilibrium dynamics—are the very elements that present difficulties for traditional economics. W. Brian Arthur, Steven N. Durlauf & David Lane, *Introduction*, in *THE ECONOMY AS AN EVOLVING COMPLEX SYSTEM II*, at 3-4 (Brian Arthur, Steven N. Durlauf & David Lane, eds., 1997).

19. ROBERT AXELROD & MICHAEL COHEN, *HARNESSING COMPLEXITY* 21 (2000).

20. Whitt & Schultze, *supra* note 1, at 224-27.

worldview; and is used at least as much in the service of empathy as of self-interest.²¹

Instead, human beings have “bounded rationality” (or, perhaps more accurately, “bounded irrationality”), imperfect information, numerous individual cognitive and emotional biases, and poor problem-solving strategies.²² Cordelia Fine puts it more bluntly: we have brains that are vain, emotional, immoral, deluded, pigheaded, secretive, weak-willed, bigoted, and vulnerable.²³ As she articulates it, “[b]eing confronted with the evidence of the distorting and deceptive window dressing of the brain is unsettling, and rightly so.”²⁴

On the other hand, research from behavioral science clearly demonstrates that we are far more flexible and multi-faceted than Old School Economics has assumed.²⁵ This built-in plasticity makes us agents capable of adaptation to a wide range of circumstances. Humans are the most “facultative” animals in the world, meaning we are able to alter our behavior in response to significant environmental changes.²⁶ This capability obviously applies to policymakers as well as market players.

One obvious implication of our well-documented cognitive constraints is that the modern economy is simply too complex for central planning to work effectively. In particular, human beings have major issues with knowledge coordination, deductive rationality, and accurate and timely feedback.²⁷ Hayek wrote often about the dangers of relying on cognitively-constrained planners:

The economic problem of society is . . . a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge not given to anyone in its totality.²⁸

21. George Lakoff, Letter to the Editor, N.Y. TIMES, July 6, 2008, at 4.

22. Whitt & Schultze, *supra* note 1, at 232-35.

23. CORDELIA FINE, A MIND OF ITS OWN: HOW YOUR BRAIN DISTORTS AND DECEIVES 202 (2008).

24. *Id.* Nevertheless, Fine believes we can rise above ourselves, by watching for influences on our decision making, being more tolerant of opposing viewpoints, resisting stereotypes, and remaining alert to the distortions and deceptions of our brains. *Id.* at 209.

25. Whitt & Schultze, *supra* note 1, at 235-37.

26. Paul H. Rubin, *The State of Nature and the Evolution of Political Preference*, 3 AM. L. & ECON. REV. 50, 53-60 (2001). Rubin argues that this facultative capacity is the basis of economics. *Id.*

27. BEINHOCKER, *supra* note 10, at 422.

28. Friedrich August von Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV., 519, 519-20 (1945).

Obviously, this casts the concept of central planning into serious doubt.²⁹ Moreover, progenitors of large-scale schemes to improve the human condition tend to regard themselves as far smarter and more farseeing than they really are, and at the same time, regard their subjects as more unintelligent and incompetent than they are in reality.³⁰ These same planners “routinely . . . ignore the radical contingencies of the future,” even though no amount of planning can deal with those contingencies.³¹

3. A Networked Economy: Cerf’s Innovation Without Permission

We also live in a *networked* economy, formed bottom-up by interactions between people in a highly connected marketplace. Any particular agent can have a link to other agents, which in turn link to others through lines of communication, common tasks, market agreements, or other relationships. This network economy thrives when there is space for experimental evolution, in which new ideas emerge and technology is constantly refined.

An open network of connections between agents can help create the conditions for emergence to occur. For example, if I am developing a product or working on a project, and I am already interconnected to various degrees with many others, I am much more likely to connect with those who have the knowledge or expertise that I need to work efficiently. I may even benefit from the work of other agents, who do not require any transaction at all,³² or with whom I never would have connected in a world of isolated agents.

The Internet is a notable and perhaps unique form of network that arose as a product of market and non-market forces. The Internet’s architecture—its modular, end-to-end, interconnected design—allows it to operate as a platform for broad-based economic activities. Generally speaking, no central gatekeeper exerts unilateral control over market activities on the Internet, and much of the activity happens with users at the edge of the network. In the words of Vint Cerf, the Internet allows “innovation without permission.”³³

29. Further, the “market” is no longer primarily domestic; it is increasingly global in scale and interconnected with other nations’ markets. This only adds to the overall complexity and reduces the potential influence of any single agent—regardless of whether it is a public or private actor.

30. See JAMES C. SCOTT, *SEEING LIKE A STATE: HOW CERTAIN SCHEMES TO IMPROVE THE HUMAN CONDITION HAVE FAILED* 343 (1998).

31. *Id.*

32. Yochai Benkler, *Coase’s Penguin, or, Linux and The Nature of the Firm*, 112 *YALE L.J.* 369, 404-05 (2002).

33. *U.S. Senate Committee on Commerce, Science, and Transportation Hearing on “Network Neutrality*, 109th Cong. 4 (2006) (statement of Vinton Cerf, Vice President and

4. An Evolving Economy: Schumpeter's Creative Destruction

Further, we live in an *evolving* economy, which consists of a population of firms differing one from another as a result of different routines developed by each firm. These routines are analogous to the genes of biological organisms, and influence the specific characteristics of the output produced by the different firms (their phenotypes). Market processes winnow by selecting the services and products of some firms—Physical Technologies, Social Technologies, and Business Plans—over those of others. The selected firms then become more successful than those not selected.³⁴ By one account, evolution is “elements adapting their state to the situation they together create.”³⁵

This is not a new concept. As Schumpeter put it,

The essential point to grasp is that in dealing with capitalism we are dealing with an evolutionary process. . . . [It is a] process of industrial mutation . . . that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism.³⁶

Evolution, seen from the perspective of the system as a whole, offers us an intermingling of stability and change, of equilibrium and apparent disorder. The pace of evolution also varies widely with time; periods of relatively slow, steady changes appear to be interspersed with periods of dramatic shifts. In biology, Stephen Jay Gould popularized the notion of “punctuated equilibrium,” whereby most species originate in geological moments of great change, and persist in stasis.³⁷ Market economies show similar behavior, as “plateaus of stagnation and bursts of achievement” appear to express a standard pattern for human learning.³⁸ This phenomenon also follows a power law, where the frequency of extinctions diminishes with the square of the size of the extinction.³⁹

Chief Internet Evangelist, Google Inc.), *available at* <http://commerce.senate.gov/pdf/cerf-020706.pdf>.

34. See RICHARD NELSON & SIDNEY WINTER, *AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE* 266 (1982).

35. W. Brian Arthur, *Out-of-Equilibrium Economics and Agent-Based Modeling*, in 2 *HANDBOOK OF COMPUTATIONAL ECONOMICS* 1551 (K. Judd & L. Tesfatsion, eds., 2005), *available at* <http://www.santafe.edu/~wbarthur/documents/OutofEquilPaper-SFI.pdf>.

36. JOSEPH ALOIS SCHUMPETER, *CAPITALISM, SOCIETY, AND DEMOCRACY* 82-83 (1943) (internal citation omitted).

37. STEPHEN JAY GOULD, *PUNCTUATED EQUILIBRIUM* (2007). Thomas Kuhn makes a similar (if not related) observation about scientific development as “a succession of tradition-bound periods punctuated by non-cumulative breaks.” THOMAS KUHN, *THE STRUCTURE OF SCIENTIFIC REVOLUTIONS* 208 (2d ed. 1970).

38. GOULD, *supra* note 37, at 272.

39. This power law relationship that describes biological extinctions is virtually identical to the pattern of extinctions among corporate firms. This is a startling result, and

5. A Growth Economy: Romer's Innovation Agenda

Moreover, we live in a *growth* economy, in which the chief currency is ideas, and the mechanism for growth is innovation. A major goal of any society should be to increase people's well-being.⁴⁰ Economic growth is a key component to a country's well-being. In addition to raising the material standard of living, growth yields significant social, political, and moral benefits not priced by the market.

While Old School Economics tells us that productivity comes simply from adding more capital, or generating greater efficiency, Emergence Economics emphasizes ways in which new technologies endogenously create better recipes for economic growth. Technological innovation has proven to be the major impetus behind the productivity increases that produce long-term economic growth.⁴¹ Mechanisms generating new ideas are as important as access to abundant resources. In Paul Romer's words, "technological change . . . lies at the heart of economic growth."⁴² The resulting emergent market phenomena include not just economic growth, with all its concomitant benefits, but what we call "net effects." These are innovation spillovers (positive externalities), peer production, and a whole social layer of activity.

6. A Political Economy: Coevolving Markets and Government

Finally, we live in a *political* economy. In *Emergence Economics*, we explained that markets are not just emergent processes embodying certain networked and evolving features.⁴³ Markets are also political.⁴⁴ Like the market, the government is a CAS, akin to a living thing.⁴⁵ This means that

poses a paradox: no biological species except for human beings can anticipate the future and respond accordingly. Creatures cannot plan their own evolution. The implication is that firms act as if at random, without intent and foresight. Apparently it is the structure of the connections between firms—the networks across which the impact of firms' strategies percolate—which is the feature ultimately responsible for the pattern of extinctions which we observe. PAUL ORMEROD, *WHY MOST THINGS FAIL* 187-88 (2005).

40. See Stuart Minor Benjamin & Arti K. Rai, *Fixing Innovation Policy: A Structural Perspective*, 77 GEO. WASH. L. REV. 101 (2008).

41. *Id.* Such innovations are not merely of the "high level," disruptive variety, but every form of innovative mid-level and ground-level products. See generally AMAR BHIDÉ, *THE VENTURESOME ECONOMY: HOW INNOVATION SUSTAINS PROSPERITY IN A MORE CONNECTED WORLD* (2008).

42. Paul M. Romer, *Endogenous Technological Change*, 98 J. OF POL. ECON. S71, S72 (1990).

43. Whitt & Schultze, *supra* note 1, at 284-88.

44. Business is inherently political, and politics is—and always has been—marked by the interests of commerce. See DEBORA L. SPAR, *RULING THE WAVES* 9-10 (2001).

45. "[G]overnment is not a machine, but a living thing. It falls, not under the theory of the universe, but under the theory of organic life. It is accountable to Darwin, not to

economies and governments are two complex systems, coevolving with the larger human culture as intertwined social constructs that rely upon each other. Firms and governments together shape the creation of markets.⁴⁶ The government policymaker must devise the proper role for dealing with an emergent, network-connected, innovation-fueled economy.⁴⁷

Contrary to some views, the market does not exist in a Platonic state of nature, pure and unconstrained. Our institutions—laws, regulations and norms—helped create a place of trusted relationships, which in turn enable people to trade and barter, buy and sell. Certainly, in the modern global economy of the early twenty-first century, we have seen the significant downside of this intertwined process, in the form of failed financial institutions and collapsed financial markets. This Article will explore some of the implications, for better and worse, of this coevolutionary process.

III. INTRODUCING THE CONCEPT OF ADAPTIVE POLICYMAKING

*But regardless of political persuasion, many economists are eager to invoke—to hide behind—what they have come to believe is the wondrous scientific rigor of received economic doctrine. This behavior denies public policy of many valuable insights that a more honest economics—an economics committed to the working out of the reasons for particular public policies—could offer.*⁴⁸

Economic theories certainly matter for public policy. For example, because the Old School Economics model of rational actors does not adequately describe economic reality, policy prescriptions built on this model are necessarily flawed.⁴⁹ At the same time, economics alone should not inform the thought process of the policymaker, especially if that brand of economics fails to appreciate its own value-laden ways of looking at the world.⁵⁰ Other socially-important elements must be included in the mix as well in order to create an appropriate concept of the public good.

Newton.” WOODROW WILSON, CONSTITUTIONAL GOVERNMENT IN THE UNITED STATES 56 (1908).

46. “One cannot overestimate the importance of governments to modern markets. Without stable, more or less non-rent seeking states, modern production markets would not exist.” NEIL FLIGSTEIN, THE ARCHITECTURE OF MARKETS: AN ECONOMIC SOCIOLOGY OF TWENTY-FIRST-CENTURY CAPITALIST SOCIETIES 3 (2001).

47. Whitt & Schultze, *supra* note 1, at 289-90.

48. DANIEL W. BROMLEY, SUFFICIENT REASON: VOLITIONAL PRAGMATISM AND THE MEANING OF ECONOMIC INSTITUTIONS 18-19 (2006).

49. ROBERT D. ATKINSON, THE PAST AND FUTURE OF AMERICA’S ECONOMY: LONG WAVES OF INNOVATION THAT POWER CYCLES OF GROWTH 247 (2004).

50. See, e.g., DUNCAN K. FOLEY, ADAM’S FALLACY: A GUIDE TO ECONOMIC THEOLOGY, at xiv (2006) (“[T]he economic way of thinking is just as value-laden as any other way of thinking about society, and can foster dangerous mistakes of judgment.”).

That said, we need to forge a different way of thinking about the conjoined public/private worlds, and in particular how our nation's policies can link the public purpose of government with the entrepreneurial and innovative capacity of the private sector.⁵¹ Between the Platonic ideals of Perfect Government and Perfect Market is the imperfect, messy, but necessary muddle of agents coevolving and coadapting. It would be a mistake, however, to think of this place between traditional "Left" and "Right" political positions as a thin, unpromising ground of compromise. Relying to a large degree on the dynamics of the private market—as enabled and channeled more fully by tailored public inputs—is an exceedingly robust position to occupy.

A. Policymaker as Adaptive Agent

According to Merriam-Webster, "policy" is defined as "a high-level overall plan embracing the general goals and acceptable procedures especially of a governmental body."⁵² More broadly, Barbara Cherry and Johannes Bauer call public policy "the art of determining a mix and dosage of instruments that can achieve the desired objectives."⁵³ Daniel W. Bromley explains public policy as collective action in "restraining, liberating, and expanding the opportunities and capacities of each of us to engage in [individual action]."⁵⁴ In brief, "all [public] policies involve deliberate attempts to change people's behavior."⁵⁵

One unstated assumption by many in government and industry is that public policy is merely the sum total of enforceable government laws and regulations. For example, Cherry and Bauer provide an alternative definition of policies as "legally enforceable rules created to effectuate the achievement of certain goals."⁵⁶ This Article seeks to challenge that assumption, and among other things, rescue the concept of policy from the black-and-white world of "to regulate or not to regulate." We should adopt

51. ATKINSON, *supra* note 49, at 242-43.

52. Policy – Definition from the Merriam-Webster Online Dictionary, www.merriam-webster.com/dictionary/policy (last visited Apr. 18, 2009).

53. Barbara A. Cherry & Johannes M. Bauer, Adaptive Regulation: Contours of a Policy-Model for the Internet Economy, Address at the 15th Biennial Conference of the International Telecommunications Society (Sept. 15, 2004) at 3 (transcript available at <http://www.quello.msu.edu/images/uploads/wp-04-05.pdf>). The full paper, developed from this address, can be found at <http://quello.msu.edu/complexity/cherry-bauer.pdf>.

54. BROMLEY, *supra* note 48, at 150; *see also id.* at 23. Bromley observes that policy is "nothing but a word we apply to a continual process of redefining – reconstructing – new realms of individual and group action." *Id.* at 150-51. He sees the policymaking process as "an exercise in practical inference," aimed at achieving describable future outcomes. *Id.* at 14.

55. DEBORAH STONE, POLICY PARADOX: THE ART OF POLITICAL DECISION MAKING 13 (rev. ed. 2002).

56. Cherry & Bauer, *supra* note 53, at 12.

a broader definition that utilizes a mix of governmental, quasi-governmental, and private actors, employing a broad spectrum of policy options that operates under the express or implied authority of the government. For example, policymakers deferring to market forces in a particular situation versus formal, legally-binding requirements still carries the imprimatur of government in achieving a particular policy objective. Not just laws and regulations, but other formal and informal instrumentalities—and not just government, but third-party groups (gradations and degrees of institutions and organizations)—collectively can produce something we call “public policy.”

Another point worth emphasizing here is that we are operating within several wide and concentric circles of community. I would like to think that the schools of thought that constitute Emergence Economics together are bigger, deeper, and richer than Old School Economics. At the same time, Emergence Economics is but one facet of a bigger, deeper, and richer social fabric that binds us all. *Homo economicus*, even properly understood, is but one facet of who we are as humans. Our public policymaking should never lose sight of that fundamental fact.

As mentioned above, many scholars conclude that economic sectors and policymaking systems are coevolving CASs, each shaping, but not fully determining, the other.⁵⁷ In essence, regulation coevolves with the industry it governs.⁵⁸ For example, communications regulation has coevolved with the telecommunications sector.⁵⁹ Stated differently:

Public policies evolve partly in response to changes in perceived demands and opportunities, changes that may result from the evolution of private technologies and market structures or from other identifiable shifts in objective conditions. Public policies may reflect not changes in objective conditions but shifts in values, or understanding.⁶⁰

To Cherry and Bauer, the chief challenge is to adopt “sustainable policy,” which is both adoptable and achievable. Because policies are outputs of and inputs to the coevolving CASs, we need to modify our expectations of what policies realistically can achieve by shifting emphasis from static optimization of parameters to an evolutionary paradigm that emphasizes adaptability.⁶¹ In particular, market sectors featuring rapid and dynamic technological change, such as telecommunications, challenge the policymaker’s ability to predict, control, and manage the system’s

57. See, e.g., *id.* at 2-3.

58. MARTIN FRANSMAN, *THE NEW ICT ECOSYSTEM: IMPLICATIONS FOR EUROPE* 73 (2007).

59. Thus, “the conceptual framework within which telecoms regulation has evolved does not include endogenous innovation as part of its logical fabric.” *Id.* at 14.

60. NELSON & WINTER, *supra* note 34, at 372.

61. Cherry & Bauer, *supra* note 53, at 3.

behavior.⁶² Policies have “feedback effects on the [political and economic] constraints—and thus modify the initial policy problem.”⁶³

This rapidly accelerating change poses a particularly troubling challenge to traditional policymaking. Devising public policy is made much more difficult given the pace of transformations in complex systems like the economy—the faster the pace, the more likely serious gaps will appear between the system’s behavior and our lagging management capabilities.⁶⁴ As one author has argued, “[t]he arms race of coevolving fitness landscapes requires constant adjusting to the coevolving fitness landscapes. There is no rest for the agents in a complex adaptive system.”⁶⁵ As I shall explore further, this fact of the “social acceleration of time” carries significant implications for how we design our market and political institutions.⁶⁶

For these and other reasons, where markets at least are contestable, Emergence Economics suggests broadly a preference for relatively minor tinkering with the market environment (fostering organic, bottom-up solutions), rather than relatively major tampering with the evolutionary process (producing a more managed, hierarchical, top-down approach).⁶⁷ This carries several implications. The first rule of adaptive policymaking is caution, for many of the reasons articulated above. Beinhocker also warns us that, if the newer forms of economic thinking are still in their youth, then their application to public policy “is in its infancy.”⁶⁸ The teachings of these disparate, yet related schools, can give us profound insights, and yet there is much still to be understood. If anything, this suggests further caution by policymakers, who may arm themselves with lessons not yet firmly established by fact and analysis.

A second observation is that there is no optimal policy outcome. Again, policymaking is a CAS “involved in a coevolutionary dance with other complex adaptive systems in society, including business and economic systems.”⁶⁹ Embedded within coevolving, interconnected social systems like technologies, markets, and policies, the government

62. Barbara A. Cherry, *The Telecommunications Economy and Regulation as Coevolving Complex Adaptive Systems: Implications for Federalism*, 59 FED. COMM. L.J. 369, 375 (2007).

63. Johannes Bauer & Steven S. Wildman, *Looking Backwards and Looking Forwards in Contemplating the Next Rewrite of the Communications Act*, 58 FED. COMM. L.J. 415, 419 (2006).

64. THOMAS HOMER-DIXON, *THE INGENUITY GAP* 290 (2000).

65. J.B. Ruhl, *Law's Complexity: A Primer*, 24 GA. ST. U. L. REV. 885, 903 (2009).

66. See generally WILLIAM E. SCHEUERMAN, *LIBERAL DEMOCRACY AND THE SOCIAL ACCELERATION OF TIME* (2004).

67. Whitt & Schultze, *supra* note 1, at 304-14.

68. BEINHOCKER, *supra* note 10, at 428.

69. Cherry & Bauer, *supra* note 53, at 20.

policymaker cannot hope to account for multiple dimensions of all possible variables, constraints, and contingencies. Indeed, some suggest that policymakers should focus more on creating the proper process for arriving at a decision, rather than prejudging the substantive outcome of the decision itself.⁷⁰ The market often seems to find a way to solve many of its problems, while governments tend to endure a “fog of policymaking.”

Third, there is no permanent policy outcome. The concept of “policy” connotes to some a timeless, placeless edifice of impermeable truth. To the adaptive policymaker, however, policy is incremental puttering with market inputs (time and space dependent) and includes appropriate ways to gauge and act upon feedback. We need to shift our mental model from the static to the dynamic coevolution of policy and the economy.⁷¹

A fourth observation is that the range of policy options is greater than we imagine. Even within the confines of what is carried out in the “regulatory” institution, there are a variety of options for regulators to explore. For example, Ruhl points out that much regulation “is based on ‘front-end’ decision making premised on the belief that we can predict and assess all the consequences of a decision and take measures to facilitate the positive effects and mitigate the negative effects.”⁷² These simplified front-end models are relied on at the expense of procedures and standards for “‘back-end’ monitoring of, and adaptation to, change through time and space.”⁷³

Finally, accountability matters. Policymakers, and the rest of us, would be wise to heed the work of researchers studying accountability of those who prognosticate for a living. Some, like Philip Tetlock, claim “[i]t is possible to define empirical and logical standards of accountability that transcend partisan wrangling and that allow us to gauge the judgmental performance of experts, from diverse points of view, on common metrics.”⁷⁴ We should hold our policymakers accountable to “standards of evidence that command broad assent across the spectrum of reasonable opinion.”⁷⁵ While acknowledging that “[f]ew of us look pretty under the

70. See Paul Kouroupas, Vice President, Regulatory Affairs, Global Crossing Limited, Process over Substance: Why Regulatory Process Is More Important than Substantive Regulatory Decisions, Address to the Int’l Telecomms. Soc. 17th Biennial Conference (June 25, 2008) (transcript available at <http://www.imaginar.org/its2008/28.pdf>).

71. Cherry & Bauer, *supra* note 53, at 26. Or as Deborah Stone puts it, “[p]olicy is more like an endless game of Monopoly than a bicycle repair.” STONE, *supra* note 55, at 261.

72. Ruhl, *supra* note 65, at 907-08.

73. *Id.* at 910.

74. PHILIP TETLOCK, EXPERT POLITICAL JUDGMENT: HOW GOOD IS IT? HOW CAN WE KNOW? 217 (2005).

75. *Id.*

cognitive microscope,”⁷⁶ Tetlock believes we should commit to “fundamental tests of good judgment.”⁷⁷

This Article will address in a later Part the institutional challenges posed by some insights from public choice theory. For now, it is worth noting that policymakers are beset by powerful influences to favor the status quo over change and progress. Robert D. Atkinson observes that during periods where new techno-economic systems are emerging, “organizations, institutions, laws, governments, the built environment, attitudes, and culture lag behind,” with most of society still “committed to old ways of doing things, old investments, old skills, old institutional arrangements, and old attitudes.”⁷⁸ During this transitional period, however, “some do not just passively wait, many actively resist the change as it threatens entrenched ways of doing and established economic positions. Moreover, old economy stakeholders, whether in business and government or as consumers and workers, usually have more power than innovators.”⁷⁹ Policymakers should jump the lag and refrain from aligning with the old forces against the new.

B. Taking an Adaptive Stance: Nine Principles

What are some basic elements for government to take an adaptive stance in the policy realm? Here are a few suggested overlapping principles to keep in mind as we begin to sketch out the policy design space and its various interrelated components. Obviously these are easy enough to say, but far more difficult to put into practice successfully.

1. Cautious

Again, the first watch word for adaptive policymaking is caution. As we have already seen, the market environment is an immensely complex place, and poses huge challenges to our human information gathering and processing systems, our deductive reasoning capabilities, and our feedback mechanisms.⁸⁰ The record of long-range economic predictions over the last two decades is one of obvious failure.⁸¹ In addition, the fitness function policymakers bring to bear may tend to reflect power hierarchies—state power, corporate power, or both—rather than the broader influences of individuals and society acting in the marketplace.⁸²

76. *Id.* at 236.

77. *Id.* at 230.

78. ATKINSON, *supra* note 49, at 26-27.

79. *Id.* at 27.

80. BEINHOCKER, *supra* note 10, at 422-23.

81. HOMER-DIXON, *supra* note 64, at 295.

82. BEINHOCKER, *supra* note 10, at 426-28.

All decisions are based on models, and all our models are wrong. A model is a simplification, an abstraction, a selection, which inevitably is incomplete and thus incorrect. “Likeness to truth is not the same as truth.”⁸³ We need humility about the limitations of our knowledge. John Sterman notes that “[s]uch humility is essential in creating an environment in which we can learn about the complex systems in which we are embedded and work effectively to create the world we truly desire.”⁸⁴ But caution should not be an excuse for indecision. Doubt should be embraced as an ally of good policy, by directing us to reassess our evidence, consider our alternatives, and plan as best as possible for the inevitable contingencies. Policymakers must act, even if by deciding not to act.

2. Macroscopic

The adaptive policymaker should also have the big picture in mind, at all times. Pierre de Vries notes that “[t]he incompleteness of any model of a complex system and the necessity for complementary perspective suggest[s] that policymakers take a big picture approach: a broad view of how problems might be solved.”⁸⁵ We should avoid the “narrow, event-oriented, reductionist world view most [of us] live by.”⁸⁶ “There are no side effects—only effects.”⁸⁷ Feedback loops shape the structure in which we find ourselves. We need “to expand the boundaries of our mental models,” in order to “see the patterns of behavior created by the underlying feedback structure. . . .”⁸⁸

This macroscopic view necessarily becomes a window into how best to create and disseminate the products of innovation. “Technological innovation . . . is a primary contributor to [a nation’s] long-term well-being,”⁸⁹ including economic growth, and yet most policymakers pay little heed to these facts. Taking the deep view of today and the broad view of tomorrow will help policymakers more fully appreciate that successful plans and programs should be rooted in driving innovation.

83. PETER L. BERNSTEIN, *AGAINST THE GODS: THE REMARKABLE STORY OF RISK* 16, 334 (1998). Bernstein cautions that our faith in risk management encourages us to take risks we otherwise would not take, such as driving more aggressively with seatbelts fastened. *Id.* at 335.

84. John D. Sterman, *All Models Are Wrong: Reflections on Becoming a Systems Scientist*, 18 *SYS. DYN. REV.* 501, 501 (2002).

85. Pierre de Vries, *Internet Governance as Forestry: Deriving Policy Principles from Managed Complex Adaptive Systems* 18 (August 12, 2008) (unpublished manuscript available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1229482).

86. Sterman, *supra* note 84, at 504.

87. *Id.* at 505.

88. *Id.* at 511.

89. Benjamin & Rai, *supra* note 40, at 108.

3. Incremental

Policymakers also must learn to take small steps, demonstrating “an experimental approach to social change.”⁹⁰ The best policymaking process is not revolutionary but evolutionary, and evolution typically proceeds in iterative measures. Each step should build on experience and practical knowledge. Karl Popper also has observed the distinction between “utopian social engineering” and piece-meal democratic reform.⁹¹ Large leaps are dangerous because they invite much greater exposure to uncertainty.⁹² Even micro-level behaviors matter and can have profound and unexpected effects on the macro-performance of a system.⁹³

4. Experimental

Along with the relative caution of small steps comes the relative boldness of novel steps. The combination of uncertainty and constraints on predictability creates the necessity for policymakers to experiment.⁹⁴ A willingness to experiment using a diversity of approaches helps protect against the unknowns.⁹⁵ In particular, policy decisions should not be treated as enduring mandates, but as a series of experiments that compete to evolve over time. Two key elements make policy work the “science of muddling through,” namely feedback and accountability.⁹⁶ Adaptive strategy suggests that policymakers should levy many small bets, in a trial-and-error (or better, trial-and-success) fashion.⁹⁷ Finally, the inevitability of failure must be accepted.⁹⁸ Indeed, “an experimentalist spirit is best maintained when

90. SCOTT, *supra* note 30, at 345.

91. KARL POPPER, *Piecemeal Social Engineering (1944)*, in POPPER SELECTIONS 304, 307-11 (David Miller ed., 1985).

92. RICHARD G. LIPSEY, KENNETH I. CARLAW & CLIFFORD T. BEKAR, *ECONOMIC TRANSFORMATIONS: GENERAL PLATFORM TECHNOLOGIES AND LONG TERM ECONOMIC GROWTH* 534 (2005).

93. BEINHOCKER, *supra* note 10, at 428. On the other hand, excessive incrementalism may be problematic where circumstances are not stable and change is coming fast. HOMER-DIXON, *supra* note 64, at 303.

94. Cherry & Bauer, *supra* note 53, at 29.

95. Moreover, reducing uncertainty is not always a legitimate objective to be factored into decisions. After all, the market environment itself already is uncertain and is part of the fundamental economic challenge to industry players.

96. See Charles E. Lindblom, *The Science of “Muddling Through”*, 19 PUB. ADMIN. REV. 79 (1959). As we shall see in Part V.B.4, I view “feedback” as transparency (information) plus accountability (responsibility); “connectivity” then adds the various lines of communication between citizen and policymaker and between citizens themselves. See also Martina Eckardt, *Explaining Legal Change from an Evolutionary Economics Perspective*, 9 GERMAN L.J. 437 (2008).

97. Hayek’s notion of competition as a trial-and-error discovery process is akin to Popper’s concept of testing scientific hypotheses through falsification. See Eckardt, *supra* note 96, at 447 n.27.

98. Cherry & Bauer, *supra* note 53, at 29.

failures can be contained as learning experiences rather than catastrophes.”⁹⁹

5. Contextual

Good policy is well-grounded and context-dependent.¹⁰⁰ The more general a theory is, the less empirical content it will have since, by ignoring the specific context in which many problems arise, it becomes impossible to analyze them in depth.”¹⁰¹ Context matters. We also need a sound empirical basis for acting, or refraining from acting. Richard Lipsey is correct that the most useful policy advice is “context-dependent, there being no simple set of policy rules that apply to all countries, times, and circumstances.”¹⁰² On the other hand, in the face of great uncertainty, one author recommends adopting a less complex “coarse” policy response that addresses a wide range of unforeseeable environments, even if in suboptimal fashion.¹⁰³ “Precision and focus in addressing the known comes at the cost of reduced ability to address the unknown.”¹⁰⁴ However, merely incorporating context into our policies is not the same as devising a “no size fits all” approach.

6. Flexible

Deep uncertainty about complex systems like markets, or especially the Internet, implies the need for flexibility, since one cannot be sure of either the nature of the problem or the best solutions.¹⁰⁵ One should plan on surprises (allow for “the largest accommodation to the unforeseen”¹⁰⁶), and plan on human inventiveness (allow room for future improvements after further experience and insight).¹⁰⁷ Lipsey discusses how policymakers should have both “design flexibility” (an ability to revise the internal structure of policies and programs) and “delivery flexibility” (an ability to change course or cut off particular flawed projects).¹⁰⁸

99. JONATHAN ZITTRAIN, *THE FUTURE OF THE INTERNET AND HOW TO STOP IT* 157 (2008).

100. Cherry & Bauer, *supra* note 53, at 28.

101. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 501.

102. *Id.* at 21.

103. See BOOKSTABER, *supra* note 15, at 232-240.

104. *Id.* at 236.

105. de Vries, *supra* note 85, at 18.

106. SCOTT, *supra* note 30, at 345.

107. *Id.*

108. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 534.

7. Provisional

Adaptive policymakers should favor reversibility. After all, “[i]rreversible interventions have irreversible consequences.”¹⁰⁹ Many neoclassical theories presuppose that market actions are inherently reversible, which is not accurate. As the passage of time and the evolution of markets invariably invalidate the premises of regulation, policymakers should build in “review checkpoints.”¹¹⁰ This would allow policies to be corrected, or even reversed, over time. As Aldo Leopold puts it, “[t]he first rule of intelligent tinkering is to keep all the parts.”¹¹¹

8. Accountable

The adaptive policymaker next must adapt—monitor the market, and adjust accordingly. Coping with uncertainty means learning from experience. Policymakers should state their beliefs in testable form, monitor their forecasted performance, and honor reputational bets.¹¹²

It is easy to obtain confirmation for nearly every theory, if we look for it, but the relevant criteria of the scientific status of knowledge is its falsifiability, refutability, or testability.¹¹³ For example, Einstein’s theory of gravitation is refutable by empirical evidence, as opposed to astrology or the Marxist theory of history. Every genuine test of a theory is an attempt to falsify it or refute it. Incremental adjustments in regulation at the “back end” of the process, for example, allow for changes based on experience with actual impact, as opposed to the significant “guesstimates” and “bounded rationality” often required for front-end analysis.¹¹⁴

9. Sustainable

Barbara Cherry talks about how sustainable policies are those rules that are both “politically adoptable and for which the desired policy goals are reasonably likely to be achievable. . . . [This] requires heightened awareness and understanding of the constraints limiting fulfillment of ‘adoptability’ and ‘achievability.’”¹¹⁵ Further, the policy must be able to survive the agency process itself. As Ruhl observes, agencies are not often rewarded for their flexibility, openness, and willingness to experiment,

109. SCOTT, *supra* note 30, at 345.

110. de Vries, *supra* note 85, at 26.

111. SCOTT, *supra* note 30, at 345 (quoting Donald Worster, NATURE’S ECONOMY 289 (2d ed. 1994) (quoting American ecologist Aldo Leopold)).

112. TETLOCK, *supra* note 74, at 230.

113. KARL POPPER, *Science as Falsification*, in CONJECTURES AND REFUTATIONS: THE GROWTH OF SCIENTIFIC KNOWLEDGE 36 (1963).

114. See Robert L. Glicksman & Sidney A. Shapiro, *Improving Regulation Through Incremental Adjustment*, 52 KAN. L. REV. 1179 (2004).

115. Cherry & Bauer, *supra* note 53, at 26.

monitor, and adapt.¹¹⁶ Thus, the surrounding organizations and institutions must evolve as well to accommodate these changes. In order for adaptive management to flourish in administrative agencies, “legislatures must empower them to do it, interest groups must let them do it, and the courts must resist the temptation to second-guess when they do in fact do it.”¹¹⁷

C. *Preparing a Policy Design Space: The “Visible Hand” of Government*

As we have seen, “[p]ublic laws, policies, and organizations are an important part of the environment that shapes the evolution of private sector activities.”¹¹⁸ Generally speaking, market forces—buying and selling, bartering and trading, competing and collaborating—are a natural phenomenon. They have emerged as part of our biological and cultural heritage as social animals. From both sources we have derived an in-built desire to fashion new things from the raw materials of our environment, and use them to achieve the necessities (and options) of life.¹¹⁹ Our basic human emotions are also part of our evolutionary makeup: when we want to possess more, it is greed; when we want to protect more, it is fear.¹²⁰

Markets, however, are something quite different. They are conceptual constructs that require institutions and organizations to buttress (or in some cases reign in) our natural desires, and direct them to productive ends. “We create the market as a reflection of our characteristic propensity to ‘truck and barter.’”¹²¹ There are many ways to design markets, some more conducive than others to the constructive flow of market forces. As we shall see, these institutions and organizations are a material instantiation of our commercial values, like trust, honesty, and integrity. The balancing of intentions shows up in our laws, which, I would surmise, probably originated from a simple need to protect ourselves and our things from the covetous designs of our neighbors.

Defining a policy design space is intended to articulate all those components necessary to successfully achieve policy ends in a dynamic market environment. Because the policymaking function is a complex

116. J.B. Ruhl, *Regulation by Adaptive Management – Is It Possible?*, 7 MINN. J. L. SCI. & TECH. 21, 30-31 (2005).

117. *Id.* at 31.

118. NELSON & WINTER, *supra* note 34, at 371-79.

119. *See, e.g.*, MICHAEL TOMASELLO, THE CULTURAL ORIGINS OF HUMAN COGNITION 39-41, 53-54 (1999) (arguing that cultural and biological evolution in humans created a tool-wielding animal creatively shaping its environment).

120. *See, e.g.*, JAAK PANKSEPP, AFFECTIVE NEUROSCIENCE, THE FOUNDATION OF HUMAN AND ANIMAL EMOTIONS 321 (2004) (greed and fear evolved in the human brain to address different aspects of the environment).

121. FOLEY, *supra* note 50, at 216.

system, each component constitutes a separate set of decisions to be made, which in turn feeds back on the other decisions in dynamic and sometimes unpredictable ways.¹²² This concept is similar to the cycle process of decision making in J.B. Ruhl's "adaptive management" approach.¹²³ Here I combine the policy goals and objectives, various organizations and institutions, competing frames and tools, and proposed projects, all contributing to the overall non-linear process in numerous and often unpredictable ways.

The pioneering work of John Kingdon can be a helpful guide here.¹²⁴ Kingdon identifies three separate process "streams" that flow through the political system: problems, policies, and politics.¹²⁵ The "problems" stream includes certain societal conditions that are defined by some as problems in need of a policy solution.¹²⁶ The "policies" stream includes a wide variety of ideas floating around in a "policy primeval soup," waiting for the opportunity to be heard.¹²⁷ Finally the "politics" stream is the players working inside and outside the formal administrative and legislative processes.¹²⁸ Each process stream is independent of the others, yet can be brought together at certain "policy windows" in an interactive "coupling" that enhances the prospects for competing policy solutions to be recognized and added to the political agenda for final action.¹²⁹

As Kingdon and others make clear, it is impossible in the political context to separate completely those (positive) judgments of fact from (normative) judgments of value. While statements of fact and value typically are intertwined in the heat of the political process, they are not the same thing.¹³⁰ Kingdon notes for example that policy problems are defined, and not just discovered, and contain a "perceptual, interpretive element."¹³¹

122. See generally D. Linda Garcia & Ellen B. Surles, *The Rise and Fall of Media Ownership Issues: A Network Perspective of the Policy Field* (Oct. 6, 2008) (unpublished manuscript, available at <http://dlindagarcia.com/wp-content/uploads/tprc-entry.doc>).

123. See Ruhl, *supra* note 116, at 34 (identifying four core functions: defining problem and objectives, select models, select players, and monitoring and evaluating performance).

124. See generally JOHN W. KINGDON, *AGENDAS, ALTERNATIVES, AND PUBLIC POLICIES* (2d. ed. 2003). Kingdon has been located within the "pluralist" tradition of political science, with his emphasis on the two separate domains of the political process and the policy community. See ANDREW S. MCFARLAND, *NEOPLURALISM: THE EVOLUTION OF POLITICAL PROCESS THEORY* 128-30 (2004).

125. KINGDON, *supra* note 124, at 16-18.

126. *Id.* at 90-115.

127. *Id.* at 116-144.

128. *Id.* at 145-164.

129. *Id.* at 165-195.

130. Geoffrey M. Hodgson, *What is the Essence of Institutional Economics?*, 34 J. ECON. ISS. 317, 319 (2000).

131. KINGDON, *supra* note 124, at 110. Under another possible formulation, I see three separate forms of analysis: (1) positive analysis: how the world works; what is; (2)

A key flaw in policymakers' thinking is to confuse and conflate these separate analytic steps; their job, difficult as it may be, should be to pry them apart as best as possible.¹³²

In crafting a policy design space, we first need to distinguish between the different elements. The components I will suggest here include the why (purpose, goals, and objectives), the how/who (institutions and organizations), the which/when/where (tools), and the what (projects). The goals are the largest, longest-term elements to be accomplished. As an example, one policy goal could be to land a human being on the planet Mars. The policy objectives are the intermediate term aims (building and testing a rocket ship to send to Mars). The organizations are the public and private players involved (Congress, NASA, contractors, and sub-contractors), while the institutions are the legal and non-legal instruments used (laws, regulations, contracts, and technical standards). The tools are the practical mechanisms utilized for achieving all of the above (computer programs that model different components of the rocket ship), while the projects are the specific, short-term aims (devising elements of the engine that will power the rocket).

As it turns out, the why component is the largely normative task of formulating issues to be addressed, which correlates roughly to Kingdon's "problems" stream. The how and who components match up well to Kingdon's politics stream, while the what component of specific policy prescriptions is similar to his policy stream.¹³³ It is one of this Article's contentions that policymakers often overlook the rich variety of players, processes, and tools available to help achieve their ultimate policy agenda. In Kyle Dixon's words, they "conflate[] norm generation with implementation of those norms."¹³⁴ Thus, consistent with our discussion thus far, the chief aim is to be bold about the vision of goals and objectives (the ought), while more modest yet flexible and open-minded about the particular programs and tools used to accomplish them (the is).

normative judgments: describing our understanding of standards or norms; what ought to be; and (3) policy prescription: what policies should be adopted; what is to be done.

132. One example is the generation of economic output (largely a positive judgment), versus the distribution of economic output (largely a normative judgment). Foley insists that "any attempt" to separate the positive and the normative in political economics is "futile" because our attitudes towards capitalism and its social logic cannot be distinguished from our analysis of its workings. FOLEY, *supra* note 50, at 215. Nonetheless, we can try.

133. Kingdon's analysis does not expressly include a counterpart to my suggested "adaptive toolkit" and its framing mechanisms, although it appears he may subsume those elements within the problem definition stream.

134. KYLE D. DIXON, THAT'S THE QUESTION: REMEMBERING INSTITUTIONAL COMPETENCIES IN A NEW ERA OF PROGRESSIVE FCC REGULATION 1 (2009) (original emphasis omitted), available at <http://fcc-reform.org/sites/fcc-reform.org/files/dixon-20090105.pdf>. Dixon suggests that policymakers "take a breath" between these two acts. *Id.* at 11.

1. The Whys of Policymaking: Purpose, Goals and Objectives

Initially, we must develop the rationale for taking a public policy position. As I have explained, government policies and economic forces coevolve together. The context is all-important. Our goals and objectives should be wedded to our understanding of any specific drawbacks in society, which our best analysis tells us is unlikely to be corrected, save some policy input.

The *why* of policymaking admittedly is a singularly subjective component of the entire process. There is “no universal, scientific, or objective method of problem definition,” nor is there one for approaching policy goals and objectives in a purely apolitical way.¹³⁵ Certain conditions come to be seen as problems based on nothing more than our individual values and beliefs.¹³⁶ Our goals and objectives typically are defined in politics. And yet, our approach still can be grounded, to the extent possible, in concrete concerns about our daily lives. In this Article, I will assume that our overarching policy aim is to achieve the “public good,” which should be defined as encompassing the sum total of personal, social, cultural, educational, economic, and democratic values worth having. Together these overlapping values support “human flourishing.”¹³⁷

Private markets are one important way of achieving the public good (as an input), and a highly constructive activity in its own right (as an output). But there is more to life than buying and selling goods and services, and the obvious material benefits that result. Contrary to the way many people today interpret Adam Smith, it is a fallacy to treat the economic sphere as separate from the rest of social life.¹³⁸ Monetary

135. STONE, *supra* note 55, at 133, 231. Bromley makes the strong case that policymakers should utilize “abduction,” or reasoning by inference from effect to cause. In seeking out the reasons – the why – for something, we are diagnosing the possible causes for certain empirical regularities, using testable hypotheses, which then allows us to select an appropriate path to achieve our ultimate goal. BROMLEY, *supra* note 48, at 23-24, 96. “The essential purpose of abduction is the production of belief about specific events.” *Id.* at 24. One important implication is that abduction is not self-referential, but instead is externally grounded in the world it seeks to explain. *Id.* at 114.

136. *Id.* at 21.

137. For one of many (blatantly naturalistic) philosophical approaches to “human flourishing,” or collective activities geared towards the ultimate end of human good, see OWEN FLANAGAN, *THE REALLY HARD PROBLEM: MEANING IN A MATERIAL WORLD* 7-13 (2007) (discussing six ways of making meaning in our lives: art, science, technology, ethics, politics, and spirituality); *see also* DANIEL C. DENNETT, *FREEDOM EVOLVES* 302 (2003) (ever-evolving human freedom is “the capacity to achieve what is of value in a range of circumstances”); MARK JOHNSON, *THE MEANING OF THE BODY: AESTHETICS OF HUMAN UNDERSTANDING* 264, 272-74 (2007) (noting that embodied meaning emerges from relations and connections grounded in human/environmental coupling).

138. FOLEY, *supra* note 50, at xiii.

incentives are only part of the human story,¹³⁹ and there are many things worth having that have little to no obvious short-term economic worth.¹⁴⁰ At bottom, public policy is about the public good, however one chooses to define it. New policies emerge from governmental processes not due to some sudden realization of the economic efficiencies involved, but because of a collective commitment to how the future ought to be constituted.¹⁴¹ As a result, the public good should be informed by the best policies from numerous related fields such as sociology, history, political science and psychology. However, the various schools within Emergence Economics should provide a basic foundation to help us achieve the public good, both in terms of economic success and non-economic benefits.¹⁴²

Further, some set up a strict dichotomy between the polis (the political community) as opposed to the agora (the economic community).¹⁴³ I submit that such a rigid separation of activities is needlessly artificial. In many modern discussions, each community has been drained of the vitality, scope, and centrality that were their provenance in ancient Greece. For starters, we should not overlook the larger “community” of free individuals that subsumes both. Also, the polis was not just the political arm of the state, but rather the self-sufficient community of citizens.¹⁴⁴ Similarly, the agora was the social center and

139. See KEN BINMORE, *NATURAL JUSTICE* 193-94 (2005) (nothing prevents our planning to use markets whenever markets are appropriate, but a society that relies only on markets is leaving much of its potential unfulfilled).

140. Dick Teresi tells the story of physicist Robert Wilson’s testimony before Congress in support of building Fermilab, the world’s largest particle accelerator. Dick Teresi, *Foreign Policy, Flemish Painters, and Pharoah Placement: The Many Purposes of Science*, IN CHARACTER, Winter 2005, available at <http://www.incharacter.org/article.php?article=18>. Despite the best prodding efforts of congressional backers of the \$250 million project, Wilson refused to justify it on national defense or other grounds. “It has nothing to do directly with defending our country except to make it worth defending.” *Id.*

141. See BROMLEY, *supra* note 48, at 18, 143.

142. “Let [the public interest] be an empty box, but no matter; in the polis, people expend a lot of energy trying to fill up that box [with foresight, planning, and conscious effort]. The concept of public interest is to the polis what self-interest is to the market.” STONE, *supra* note 55, at 21.

143. Bromley points out that this “demarcationist vision” is foundational to the claim that the science of economics is separate from (and superior to) the art of governance and politics. BROMLEY, *supra* note 48, at 199. Stone identifies the agora (unfavorably) with rational decision-making models and autonomous, self-interested individuals. STONE, *supra* note 55, at 15-34. That view apparently is influenced by Old School Economics, and no longer should be seen as the way that markets and individuals really operate. At the same time, I would agree generally with Stone’s comparably favorable assessment of the polis as characterized by constant and forthrightly political striving to achieve the public interest. *Id.* As Bromley puts it, society should decide what it wants before consulting economists to determine how to get there. BROMLEY, *supra* note 48, at 211.

144. See Steve Basson, *Beware Greeks Bearing Gifts: The Greek Agora Revisited as a Discontinuous Subject of Historical Knowledge*, in LIMITS: PROCEEDINGS OF THE 21ST

communal heart of the polis, not just the marketplace. In essence, the agora is the public space where many forms of discourse and exchange took place within the polis.¹⁴⁵ This view mirrors what Benkler calls “The Great Agora,” which facilitated the unmediated conversation of the many with the many,¹⁴⁶ and should inform our more robust conceptions of the market under Emergence Economics.

First, then, we must explicate the overall purpose for our policy activities: to achieve the goals and objectives laid out in the previous Section. The *why* here is straightforward: we seek to discipline the market behavior of particular economic agents, either to do things that they would not otherwise do, or refrain from doing things they otherwise would do. This can be accomplished directly or indirectly, by various means.

Next, we must develop our policy goal. This is the most ambitious, longest time-scale element to be accomplished, and is intended to influence large-scale technological change. In our example, the one goal is landing a spaceship on Mars. A goal constitutes a normative statement—the *ought* we decide we wish to achieve.

The objectives are the more concrete, intermediate-term aims to meet the goal, in this case, building and testing a rocket ship capable of being sent to Mars. One can break down the objective component into three stages: design, implementation, and performance.¹⁴⁷ Lipsey cautions that these objectives should be “clear, unambiguous, and single-minded.”¹⁴⁸ Importantly, adverse side-effects should be expected as inevitable, but still accepted if social benefits are judged to be greater than the costs.¹⁴⁹

I will explore each of these three components later in this Article in the context of communications policy.

ANNUAL CONFERENCE OF THE SOCIETY OF ARCHITECTURAL HISTORIANS AUSTRALIA AND NEW ZEALAND 14-19 (2004). The polis gave rise to a new sense of individual and collective being, and to spaces of free action and speech to serve each citizen’s “political conditions of life.” *Id.* at 15.

145. *Id.* at 16 (The agora was “a space of multiple and overlapping activities whose juxtaposed and interjacent orders of political, religious, commercial and urban possibility denote a complex discourse of collective space”).

146. See Yochai Benkler, *From Consumers to Users: Shifting the Deeper Structures of Regulation Toward Sustainable Commons and User Access*, 52 FED. COMM. L.J. 561, 565 (2000).

147. See LIPSEY, CARLAW & BEKAR, *supra* note 92, at 540-41 (discussing what the authors call “focused policies”—encouraging the development of specific technologies or products—which corresponds well to this Article’s concept of “objectives”).

148. *Id.* at 539.

149. *Id.*

2. The “Hows” and “Whos” of Policymaking: Institutions and Organizations

It is not enough to understand the teachings of Emergence Economics, and what it takes to be an adaptive policymaker. There is the concomitant need to have the ability and will to translate that understanding into actual policy—Kingdon’s “politics” stream. As we shall see, this is where trust-building institutions and organizations become so critical. Without the proper players and rules at the table, the actual policy outcome will falter, regardless of the level of understanding by policymakers.

Further, as pointed out earlier, it is a fallacy to think of the “free market” as some blissful, natural realm comprised of nothing but happy buyers and sellers. Markets are created mechanisms, a combination of our evolutionary-derived market forces and our chosen institutions and organizations. The latter do not spring to life unbidden—they develop over time at that place where the economic and the political come together.¹⁵⁰ Markets require an institutional infrastructure to enable and sustain them.¹⁵¹ In turn, our policymakers craft the rules and players of the economic game—the “visible hand” of the government at play. Blocher makes the point well: “[f]ar from being a place where individuals costlessly and perfectly pursue their self-interest, the marketplace turns out to be populated with institutions that regularize interactions and lower transaction costs.”¹⁵²

150. See Rubin, *supra* note 26, at 2 (“Social structure, property rights, and rule-like behavior are older than Homo sapiens, so that it is not meaningful to talk about human beings existing solely as individuals in an environment with no political or legal structure. There was never a time when human beings existed with no rules.”). Bromley even claims that there is “no such thing as the market,” but instead “arenas of exchange that are the product of prior human creation.” BROMLEY, *supra* note 48, at 32-33. He, too, would agree that any market is a social construct. *Id.*

151. Barbara Cherry, *Institutional Governance for Essential Industries Under Complexity: Providing Resilience Within the Rule of Law*, 17 COMM.LAW CONSPICUOUS (forthcoming 2009), available at <http://lgst.wharton.upenn.edu/cmcl/papers/2008/cherry.pdf>. As Douglass North summarizes the point, “[t]he structure, whether of individual markets or an entire political/economic system, is a human-made creation whose functioning is neither automatic nor ‘natural.’” DOUGLASS C. NORTH, UNDERSTANDING THE PROCESS OF ECONOMIC CHANGE 162 (2005).

152. Joseph Blocher, *Institutions in the Marketplace of Ideas*, 57 DUKE L.J. 835, 838 (2008). For the same reason, to be pro-market and pro-business are two separate things. To support working markets is to favor institutional and organizational design and tailored policy inputs that collectively enable markets to operate in an optimal fashion for as many participants as possible. To be pro-business, by contrast, is to favor only one side of a multi-factored equation, in the process downplaying the other ingredients that make for a strong and vibrant market economy (one can make a similar observation about those advocating only “pro-consumer” policies). If the financial crises of 2008-09 have demonstrated anything, it is that U.S. policymakers tend to side too often with those waving the pro-business banner, at the expense of the larger interests of a healthy marketplace. One

Lipsey, for one, shows that the success of a policy is not determined solely by its blueprint, but also depends on the specific context in which the policy is implemented—the institution and the organization.¹⁵³ Policies that work well are designed to operate within the institutional competencies of organizations that will administer them. Thus, a policy that looks good on paper still may run aground due to poor organizational or institutional choices.¹⁵⁴

In this Part, we will look more closely at the *hows* and *whos* of policymaking: the institutions and organizations, respectively. In some respects, we will be guided by thinkers adhering to the New Institutional Economics (NIE).

a. The Institutional Platforms: Rules of the Game

Much of human interaction and activity is structured in terms of overt or implicit rules—the *how* of accomplishing something. These rules of the game have been called institutions. As Hayek reminds us, “[m]an is as much a rule-following animal as a purpose-seeking one.”¹⁵⁵ Rules defined broadly can include norms of behavior and social conventions on one end of the scale, as well as legal rules on the other end. All markets are social institutions, not abstract entities, which operate in a given framework of law, taxation, and social obligations or expectations.¹⁵⁶ A legal code, a farmer’s market, and a crop rotation are examples of institutions.¹⁵⁷

Moreover, incentives drive markets. And institutions are the incentive structure of economies.¹⁵⁸ Belief systems constitute the “internal representation[s] of the human landscape,” and institutions the “external

challenge going forward is to resist the urge to adopt either pro- or anti-business (as opposed to market-enhancing) financial policies.

153. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 522, 527.

154. *Id.* at 540. Nelson and Winter similarly observe that the particular institutions and procedures for arriving at and modifying policy decisions determine the way in which the various social forces are translated into new policy departures. NELSON & WINTER, *supra* note 34, at 372. The authors note that “[s]ometimes the institutional machinery for making policy seems to take on a life of its own.” *Id.*

155. 1 F.A. HAYEK, LAW, LEGISLATION, AND LIBERTY: A NEW STATEMENT OF THE LIBERAL PRINCIPLES OF JUSTICE AND POLITICAL ECONOMY, RULES AND ORDER 11 (1973). To a certain extent, we become who we are “in virtue of what the prevailing institutional arrangements predispose – indeed, often force – us to become. BROMLEY, *supra* note 48, at 47-48.

156. DIANE COYLE, THE SOULFUL SCIENCE: WHAT ECONOMISTS REALLY DO AND WHY IT MATTERS 161 (2007).

157. David Schwab & Elinor Ostrom, *The Vital Role of Norms and Rules in Maintaining Open Public and Private Economies*, in MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY 213 (Paul J. Zak ed., 2008).

158. NORTH, *supra* note 151, at vii.

manifestation of that representation.”¹⁵⁹ Douglass North observes that “[i]nstitutions structure human interaction by providing an incentive structure to guide human behavior. But an incentive structure requires a theory of the way the mind perceives the world and its functioning so that the institutions will provide those incentives.”¹⁶⁰ Because institutions are always imperfect incentive systems, the analytical framework should take that into account.¹⁶¹

“Today’s financial world is the result of four millennia of economic evolution,” including “financial intermediation” fostered by various institutional innovations.¹⁶² Our evolved ability of abstract reasoning has allowed us to create institutions like money, markets, and cities to help reduce or even overcome transaction costs, notably the costs of searching for resources, obtaining information, and negotiating and enforcing transactions.¹⁶³ Institutions also provide the foundation of social trust among strangers.¹⁶⁴ This is important because “high-trust societies exhibit[] higher rates of investment and growth.”¹⁶⁵ Human beings have inherited a built-in psychology that makes them inherently suspicious of strangers, and yet we are still able to benefit enormously from institutional arrangements that make it reasonable to trust strangers as honorary friends.¹⁶⁶ “[A]most all of the institutions of modern society can be understood as dedicated to an utterly unnatural division of labor between strangers.”¹⁶⁷ In these ways, healthy institutions contribute to the free flow of goods, services, and ideas in society.¹⁶⁸

History clearly shows “how difficult it is for societies to evolve viable and sustainable institutions of capitalism and how fragile and contingent these institutions are.”¹⁶⁹ Government is necessary to establish the legal

159. *Id.* at 49.

160. *Id.* at 66.

161. *Id.* at 67.

162. NIALL FERGUSON, *THE ASCENT OF MONEY: A FINANCIAL HISTORY OF THE WORLD* 341 (2008).

163. R.H. Coase, *The Nature of the Firm*, 4 *ECONOMICA* 386, 390-92 (1937).

164. PAUL SEABRIGHT, *THE COMPANY OF STRANGERS: A NATURAL HISTORY OF ECONOMIC LIFE* 244 (2004).

165. Paul J. Zak & Stephen Knack, *Trust and Growth*, 11 *ECON. J.* 295, 297 (2001), available at <http://www.neuroeconomicstudies.org/pdf/Trust%20and%20Growth.pdf>.

166. SEABRIGHT, *supra* note 164, at 243.

167. *Id.* at 244. On the other hand, fairness and a sense of equity appear to have roots in our evolutionary past. See BINMORE, *supra* note 139, at 193-94 (exploring the evolutionary origins of the human fairness norms that form the basis for our notion of justice).

168. Blocher, *supra* note 152, at 846. Geoffrey Hodgson believes that “[i]n a world of incomplete and imperfect information, high transaction costs, asymmetrically powerful relations, and agents with limited insight, powerful institutions are necessary to enforce rights.” Geoffrey Hodgson, *What are Institutions?*, 40 *J. ECON. ISSUES* 1, 15 (2006).

169. FOLEY, *supra* note 50, at 224.

institutions that allow for efficiency in both market transactions and the formation of firms.¹⁷⁰ Markets and institutions are not “spontaneously generated social phenomenon[a]” and “‘human nature’ seems just as likely to evolve stagnant, predatory power hierarchies as it is to create a progressive capitalism.”¹⁷¹ Yet, until recently, many commentators largely ignored questions of institutional design when advocating policy goals, and in particular, determining how to design government institutions that have the best chance of pursuing particular social goals and implementing sound policy.¹⁷² Thus, market capitalism requires conscious political effort to foster the trust-generating institutions necessary to make it function at all.

i. Institutions Defined

Institutions have been defined in a rich variety of ways. North analogizes that “[i]nstitutions are the rules of the game; organizations are the players; it is the interaction between the two that shapes institutional change.”¹⁷³ Alston says that “institutions are the informal norms and formal laws of societies that constrain and shape decision-making,”¹⁷⁴ while Bromley adds that they are “the means whereby the collective control of individual action is given effect.”¹⁷⁵ Nelson insists that “the social technologies that are employed in an economy are enabled and constrained by things like laws, norms, expectations, governing structures and mechanisms, customary modes of transacting and interacting.”¹⁷⁶ Hodgson claims that institutions include “[l]anguage, money, law, systems of

170. Benjamin & Rai, *supra* note 40, at 111-12. “The historical problem of facilitating stable capital, labor, and product markets eventually required governments . . . to produce general institutional arrangements . . . around property rights, governance structures [for controlling competition], rules of exchange, [and conceptions of control].” FLIGSTEIN, *supra* note 46, at 27.

171. FOLEY, *supra* note 50, at 224. The economy essentially is embedded in, and contingent upon, prevailing political norms and processes. BROMLEY, *supra* note 48, at 202.

172. Benjamin & Rai, *supra* note 40, at 106.

173. NORTH, *supra* note 151, at 59 (internal citation omitted). North broadly defines the institutional framework as the political structure (how we develop and aggregate political choices), plus the property rights structure (defines formal economic incentives), plus the social structure (norms and conventions that define informal incentives in the economy). *Id.* at 49.

174. Lee J. Alston, *A Framework for Understanding Institutional Analysis in Law and the Social Sciences* 4 (American University of Paris, Working Paper No. 36, 2006) (on file with author).

175. BROMLEY, *supra* note 48, at 31.

176. Richard R. Nelson, What Makes an Economy Productive and Progressive? What Are the Needed Institutions? 8 (Sept. 24, 2006) (unpublished manuscript, available at <http://www.hbs.edu/units/tom/docs/rnelson1.pdf>).

weights and measures, table manners, and firms.”¹⁷⁷ In brief, whatever the parameters employed, institutions “make up the stuff of social life.”¹⁷⁸

Although there is some disagreement over what specific instruments constitute institutions,¹⁷⁹ the single most important characteristic of institutions is that they both constrain and enable behavior. Hodgson finds that “the individual is socially and institutionally constituted.”¹⁸⁰ To some, institutions amount to metaphorical prisons within which inmates act, or the behavior of the inmates themselves.¹⁸¹ North similarly finds that “the performance characteristics of any market are a function of the set of constraints imposed by institutions . . . that determine the incentive structure in that market.”¹⁸²

The important takeaway is that there is a wide and often underappreciated range of human instruments that can be utilized in support of policymaking.¹⁸³ The NIE school has been wrestling for years with questions about the appropriate institutions for a market economy. Neoclassical economics generally was dismissive of institutions, and has lacked empirical data about their role. By contrast, institutions constitute “the alpha and the omega” of NIE, because they help determine economic performance.¹⁸⁴ In particular, institutions—from law and contracts to norms and codes of behavior—can reduce information uncertainty and transaction costs.¹⁸⁵ “[D]ifferent institutional arrangements will lead to different trajectories, different combinations of static and dynamic performance characteristics—including [different] prices . . . , the diversity of services available, the rate at which new services are introduced to the market, and the ubiquity of access to services and content.”¹⁸⁶

ii. A Gamut of Institutional Choices

The market consists not just of formal systems of coordination, but public and private codes of conduct, including “antecedent patterns and

177. Hodgson, *supra* note 130, at 327.

178. *Id.* at 2.

179. Nelson argues that it is “a very heterogeneous bag of things that are being called institutions.” Nelson, *supra* note 176, at 4. He questions a clean distinction between institutions and organizations, as North and others find. *Id.* at 10.

180. Hodgson, *supra* note 130, at 327.

181. Hodgson, *supra* note 168, at 8.

182. NORTH, *supra* note 151, at 76.

183. Some believe that institutions should not be seen merely as tools of regulators, but complex social processes in their own right. STONE, *supra* note 55, at 351.

184. Alston, *supra* note 174, at 2.

185. NIE also abandons neoclassical assumptions about perfect information and zero transaction costs. Jedidiah Brewer, et al., *Law and the New Institutional Economics: Water Markets and Legal Change in California*, 26 J. L. & POL’Y 183, 183-84 (2008).

186. Bauer & Wildman, *supra* note 63, at 433.

norms of social trust, community, and cooperation, without which market exchange is inconceivable.”¹⁸⁷ These formal and informal institutions of social interactions differ by degrees of coercion, flexibility, and accountability, and formal versus informal constraints. Researchers are now beginning to catalog the growing literature on various innovative approaches to regulation.¹⁸⁸

Of course, our most formal, authoritative, and enforceable institution is law. Sources of law include constitutions, statutes, and judge-made (or common) law. “[L]aw is fundamentally about levering human behavior in directions it might not go on its own.”¹⁸⁹ Legal rules also can be viewed as mechanisms that individuals can utilize to deal with scarcity and conflict in the environment. The rule of law is an emergent property of the legal/policymaking system,¹⁹⁰ which has evolved in variation, selection, and retention phases.¹⁹¹

The particular form of law can make a genuine difference in outcomes. Paul Zak shows, for example, that institutions based on English common law tend to be more flexible and successful than institutions based on the Napoleonic civil codes.¹⁹² Common law as an institution owes its longevity to the fact that it is not a final codification of legal rules, but rather a set of procedures for continually adapting broad principles to novel circumstances.¹⁹³ Other commentators have shown that statutory interpretation of a law is a complex adaptive system, which must either

187. SCOTT, *supra* note 30, at 351.

188. See, e.g., Cary Coglianese & Robert A. Kagan, *Introduction*, in REGULATION AND REGULATORY PROCESSES xxii-xxvi (Cary Coglianese & Robert A. Kagan eds., 2007) (summarizing “new directions in regulatory design”).

189. Owen D. Jones, *On the Nature of Norms: Biology, Morality, and the Disruption of Order*, 98 MICH. L. REV. 2072, 2073-74 (2000) [hereinafter *Nature of Norms*]. While the law is about regulating human behavior, Jones has written elsewhere how it lacks an independent theory of how humans actually behave. See Owen D. Jones, *Proprioception, Non-Law, and Biological History*, 53 FLA. L. REV. 831 (2001) [hereinafter *Proprioception*].

190. See Cherry, *supra* note 151.

191. See Mauro Zamboni, *From ‘Evolutionary Theory and Law’ to a ‘Legal Evolutionary Theory’*, 9 GERMAN L. J. 515 (2008).

192. Paul Zak, *Introduction*, in MORAL MARKETS, *supra* note 157, at xv. One author reports that common law countries (with judge-made law traditions) experience faster economic growth than civil law countries (with legal code traditions), reflecting the common law’s greater orientation toward private economic activity and the civil law’s greater orientation toward government intervention. See Paulo G. Mahoney, *The Common Law and Economic Growth: Hayek Might Be Right* (Jan. 2000) (UVA School of Law, Working Paper No. 00-8); see also Mark White, *Legal Practice and Economic Adaptation: Common Practice and Roman Practice Compared* (Feb. 17, 1997), (unpublished manuscript, on file with the Federal Communications Law Journal) available at <http://geocities.com/WallStreet/7891/praxix.htm> (Common Practice, which permits what it doesn’t prohibit, enables more innovation and economic growth than Roman Practice, which prohibits what it doesn’t permit).

193. SCOTT, *supra* note 30, at 357.

evolve or collapse,¹⁹⁴ while still others find that “transformative change” is at the heart of the ever-evolving common law process.¹⁹⁵

Putting aside formal law, the next set of institutions involves power that is wielded not by those elected to office, but rather those who administer the laws. Regulations are those government policies ostensibly based on statutory law, but which typically provide far more detailed guidance to market players.¹⁹⁶ The two fundamental choices of when to apply regulation are *ex ante* (before the fact) and *ex post* (after the fact).

Beyond traditional “command and control” legal instruments, which are the usual focus of any administrative law textbook, the policy world begins to look a bit fuzzy. Nonetheless, there exists a gamut of other policy institutions which until recently have received markedly less attention. One example is the policy principle. Principles are even more flexible than *ex post* regulations, but often do not carry the same coercive effect.¹⁹⁷

Another type of less formal institution is the bully pulpit, or raised eyebrows. Rather than formally and expressly apply a regulatory requirement on a particular actor or industry, policymakers instead can rely on their authority (and the implicit threat to wield it) in order to compel action.¹⁹⁸ This type of policymaking sometimes may not be witnessed in openly public contexts, but its impact on market agents nonetheless can be very real.¹⁹⁹

194. See Jeffrey G. Miller, *Evolutionary Statutory Interpretation: Mr. Justice Scalia Meets Darwin*, 20 PACE L. REV. 409 (2000).

195. ALLAN C. HUTCHINSON, *EVOLUTION AND THE COMMON LAW* 2-5 (2005).

196. See Regulations – Definition from the Merriam-Webster Online Dictionary, www.merriam-webster.com/dictionary/regulations (last visited Apr. 18, 2009) (regulation is “a rule or order issued by an executive authority or regulatory agency of a government and having the force of law.”).

197. Kenneth Jull & Stephen Schmidt, *Preventing Harm in Telecommunications Regulation: A New Matrix of Principles and Rules Within the Ex Ante Versus Ex Post Debate* 13 (2008) (unpublished manuscript presented at the 19th European Regional Conference of the International Telecommunications Society, Rome, Italy, September 18-20, 2008, on file with author). The FCC’s *Internet Policy Statement* is one such set of principles, although the actual scope of applicability and enforceability is yet to be decided by the courts. *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Internet Policy Statement*, FCC 05-151 (rel. Sept. 23, 2005).

198. See Bully Pulpit – Definition from the Merriam-Webster Online Dictionary, available at <http://www.merriam-webster.com/dictionary/bully%20pulpit> (last visited Apr. 18, 2009) (a bully pulpit is “a prominent public position (as a political office) that provides an opportunity for expounding one’s views”).

199. Then-FCC Chairman Michael Powell employed this approach when he suggested, first in a speech, then later in a law review article, the four “Internet Freedoms” that broadband providers should adopt under his “informal guidance.” Michael K. Powell, Chairman, FCC, *Address to Voice on the Net Conference* (Oct. 19, 2004) (prepared remarks available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-253325A1.pdf); see also Michael K. Powell, *Preserving Internet Freedom: Guiding Principles for the Industry*, 3 J. TELECOMM. HIGH TECH. L. 5, 11-12 (2004).

Then there are those institutions that bring together public and private regulation of the marketplace. The “stronger” version is co-regulation, where the government and the private sector each carve out a specific role for themselves. Ofcom, the British telecommunications regulator, recently undertook a comprehensive survey to determine when and how to employ co-regulation.²⁰⁰ The “weaker” public/private institutional approach is self-regulation, which delegates rulemaking and enforcement functions entirely to the regulated firms or other third-party groups.²⁰¹ Angela Campbell defines self-regulation as industry doing one or more of the functions of regulation—legislation, enforcement, and adjudication.²⁰² The goal of self regulation is to lower transaction costs, provide a principled structure to facilitate negotiations, and provide some measure of predictability and reliability to a framework that avoids the escalation and politicization of disputes and understanding.²⁰³ The claimed “pros” of self-regulation include greater efficiency, flexibility, incentives to comply, and cost savings versus a government role; the claimed “cons” include industry subversion of the process, inadequate enforcement and sanctions, and lack of compliance and anti-competitive conduct by bad actors.²⁰⁴ The success of self-regulation can depend on industry incentives and expertise, the ability to audit activities, objective standards, a fair process, and public participation.²⁰⁵ Business has an obvious interest in adopting systems of

200. OFFICE OF COMM., INITIAL ASSESSMENTS OF WHEN TO ADOPT SELF- OR CO-REGULATION: CONSULTATION (Mar. 27, 2008) (U.K.) (seeking public comment on proposed regulations), available at <http://www.itu.int/ituweblogs/treg/content/binary/condoc.pdf>; see also OFFICE OF COMM., IDENTIFYING APPROPRIATE REGULATORY SOLUTIONS: PRINCIPLES FOR ANALYZING SELF- AND CO-REGULATION: STATEMENT (Dec. 10, 2008) (U.K.) (laying out situations where self-regulation and co-regulation are more likely to work well), available at <http://www.ofcom.org.uk/consult/condocs/coregulation/condoc.pdf>.

201. Coglianese & Kagan, *supra* note 188, at xxiii.

202. Angela J. Campbell, *Self-Regulation and the Media*, 51 FED. COMM. L.J. 711, 714-15 (1999).

203. PHILIP J. WEISER, EXPLORING SELF REGULATORY STRATEGIES FOR NETWORK MANAGEMENT, FLATIRONS SUMMIT ON INFORMATION POLICY 7 (2008), available at <http://www.silicon-flatirons.org/documents/publications/summits/WeiserNetworkManagement.pdf>. Weiser explores various self regulation models, including FCC-related examples. *Id.* at 21-24.

204. Campbell, *supra* note 202, at 715-720.

205. *Id.* at 757-761. Similarly, Kyle Dixon and Ray Gifford talk about “private trust systems,” which include “ongoing industry consortia, standard-setting organizations, and other entities designed to build trust among typically antagonistic parties for their mutual benefit.” These systems create a framework for channeling business tensions productively and predictably, even as compared to public regulation. Kyle Dixon & Ray Gifford, *Complementing Advocacy with Private Trust Systems and Other Long-Term Collaboration*, CONVERGENCE COMPASS LEGAL UPDATE 1 (Kamlet Sheperd & Reichert, LLP Feb. 2008), available at <http://www.kamletshepherd.com/UserFiles/File/March%20Convergence%20Compass.pdf>.

self-regulation whenever it can stave off more costly forms of governmental regulation.²⁰⁶

From co- and self-regulation we then move into the world of increasingly private activity, reliant more on contractual arrangements and even handshakes over statutes or regulations. In particular, all economic activity, to some degree, utilizes codes of conduct and standards. These are stand-alone measures adopted by industry players which are intended to demonstrate a common way of carrying on business. Examples include the IEEE (originally the Institute for Electrical and Electronic Engineers), an international engineering body of nearly 400,000 members which develops the industrial standards that enable, among other things, modern communications networks.²⁰⁷ Despite the lack of coercive governmental authority, industry standards still compel a certain constraint on market behavior based on developing consensus.

Social norms are the final, and in some ways the most intriguing, form of institution. One can view norms as the shared understanding within a group of people of how to live and work together.²⁰⁸ They are behavioral regularities, based on networks of mutual beliefs of approval or disapproval of conduct.²⁰⁹ These “rules of conduct [] constrain self-interested behavior and [] are adopted and enforced in an informal, decentralized setting.”²¹⁰ In a broader sense, social norms are a “common expectation and practice regarding behavior in a particular relationship setting,” such as people paying taxes, or criminals going to jail.²¹¹

206. Coglianese & Kagan, *supra* note 188, at xxiii. There is some evidence that the embrace of self-regulation by corporations is motivated largely by pervasive fear and anxiety about state coercion, rather than the costs or efficacy of regulation. Jodi L. Short, *Coercive State Anxiety and the Rise of Self-Regulation* 58 (Georgetown Law Faculty Working Paper 1340053, 2009), abstract available at www.ssrn.com/abstract=1340053.

207. IEEE – IEEE Standards Association, <http://www.ieee.org/web/standards/home/index.html> (last visited Apr. 18, 2009). At last count, the IEEE had nearly 1,300 different standards development projects underway. *Id.*

208. DANIEL FRIEDMAN, *MORALS AND MARKETS: AN EVOLUTIONARY ACCOUNT OF THE MODERN WORLD* 19 (2008). Friedman goes on to explain how our hunter-gatherer ancestors had a behavioral toolkit that included egalitarianism, sharing meals, and hospitality and gift exchanges; these “spot exchanges” of favors eventually turned into the central marketplace of the bazaar. *Id.* at 24-35.

209. See Hodgson, *supra* note 168, at 5. One commentator finds that sources of regulation include “organizational code,” or behavioral, strategic, and legal norms arising spontaneously. Andrea M. Matwyszyn, *Organizational Code: A Complexity Theory Perspective on Technology and Intellectual Property Regulation*, 11 J. Tech. L. & Pol’y xv (2006).

210. Paul G. Mahoney & Chris W. Sanchirico, *Competing Norms and Social Evolution: Is the Fittest Norm Efficient?*, 149 U. PA. L. REV. 2027, 2030 (2001).

211. *Id.* at 2032.

Importantly, norms evolve,²¹² derived from natural selection shaping the brain.²¹³ Evolved human fairness norms lie at the root of our notions of justice.²¹⁴ This is likely because strongly held norms, such as fair dealings, can reduce the need for more costly formal transaction mechanisms, like contracting and enforcement instruments. Sanctions and reputation effects can deter serious cheating.²¹⁵ However, questions remain concerning how informal constraints evolve, and their relationship to change in formal rules.²¹⁶ For example, experts debate how much norms evolve as a result of conscious, deliberate change, and how much of that evolution is incremental, and non-deliberate in nature.²¹⁷

Social capital is the term used for that set of informal values or norms shared among members of a group—such as reliability, honesty, and reciprocity—that permit cooperation among them.²¹⁸ Many informal sanctions rely on social ties and outcomes such as reputational loss.²¹⁹ Our open, self-organizing economic system is effective only because, most of the time, most of its participants abide by internally motivated “positive” values, such as trustworthiness, fairness, and honoring commitments.²²⁰ External institutions intervene when there is a deviation from a given standard—such as excessive greed or unduly risky behavior—thereby reinforcing values-based expectations. “[T]rust is a cognitive assessment tool that suggests . . . it would not be unwise to make oneself vulnerable to another for the prospect of a potential gain.”²²¹

There was never a time when humans lived with no rules, or when such rules were created de novo.²²² Indeed, “without any norms or rules

212. NORTH, *supra* note 151, at 50.

213. Jones, *Nature of Norms*, *supra* note 189, at 2074.

214. BINMORE, *supra* note 139. Binmore explains that “social contracts,” the “set of common understandings that allow the citizens of a society to coordinate their efforts,” are based on our capacity for empathetic identification with others. *Id.* at 3, 113-16.

215. FRIEDMAN, *supra* note 208, at 20-21.

216. NORTH, *supra* note 151, at 74.

217. *Id.* at 76.

218. Jones, *Nature of Norms*, *supra* note 189, at 2079-80.

219. Zak & Knack, *supra* note 165, at 295, 298-99, 300, 317. Because firms embedded in a particular social group will be more sensitive to such informal sanctions, one policy takeaway is to foster denser ties between agents.

220. Oliver Goodenough & Monika Gruter Cheney, *Preface: Is Free Enterprise Values in Action?*, in *MORAL MARKETS*, *supra* note 157, at xxiii.

221. Erin Ann O’Hara, *Trustworthiness and Contract*, in *MORAL MARKETS*, *supra* note 157, at 175, 176. Adam Smith believed that “[w]here people seldom deal with one another, we find that they are somewhat disposed to cheat, because they can gain more by a smart trick than they can lose by the injury which it does their character.” Adam Smith, *Lecture on the Influence of Commerce on Manners* (1766), reprinted in *REPUTATION: STUDIES IN THE VOLUNTARY ELICITATION OF GOOD CONDUCT* 17 (Daniel B. Klein ed., 1997).

222. Rubin, *supra* note 26, at 52.

related to the private exchange of goods, a Hobbesian state of nature exists.”²²³ On the other hand, “[n]orms of honesty, integrity, [and] reliability lower transaction costs.”²²⁴ “[H]istorically, the best results seem to have come from modest and limited efforts to build institutions such as central banks, social security, and antitrust authorities to deal with specific problems.”²²⁵ These efforts show an attempt to balance unbridled self-interest with larger social obligations, so as to promote the market’s overall benefits more widely.

For purposes of this Article, the takeaway is that “[s]ocial control . . . often [can be] achieved through social norms—informal, decentralized systems of consensus and cooperation—rather than through [command-and-control measures].”²²⁶ Indeed, laws can inform norms, and vice versa.²²⁷ One scholar even argues that “there is no sharp difference between social norms and law; rather, all rules begin as norms of some sort and as complexity grows, some norms become enforced as laws.”²²⁸ Nonetheless, the very real “difference between a *norm* and a *rule* is the presence of a [formalized] sanction [enforced by the state]: the OR ELSE condition.”²²⁹ The force of informal constraints is “derived from the beliefs of its citizens.”²³⁰ Guilt and shame can become norm enforcement mechanisms, and in turn, leaders can use those emotions to enforce norms.²³¹

iii. Selecting the Right Institutional Approach

Now that we have briefly reviewed the varied taxonomy of institutions, it would be useful to at least touch on some ways to think about choosing the appropriate institutional approach for any particular policy situation. The adaptive policy challenge is to align the institutional platforms so that we have the best achievable policy balance: maximum adaptability and flexibility, with some form of accountability, and minimal

223. Schwab & Ostrom, *supra* note 157, at 207.

224. NORTH, *supra* note 151, at 75. By contrast, some norms, such as racial discrimination, can inhibit positive market outcomes, and have obvious negative social impacts.

225. FOLEY, *supra* note 50, at 225.

226. Mahoney & Sanchirico, *supra* note 210, at 2027-28. Bromley concurs that the “informal” end of the spectrum – “the norms, habits, standard practices, customs, traditions, and conventions [] provide important boundaries to, and parameters for, much individual and collective action....” BROMLEY, *supra* note 48, at 22-23.

227. Alston, *supra* note 174, at 3

228. PAUL H. RUBIN, *DARWINIAN POLITICS: THE EVOLUTIONARY ORIGIN OF FREEDOM* 82 (2002).

229. Schwab & Ostrom, *supra* note 157, at 214.

230. Alston, *supra* note 174, at 4.

231. “[M]any business managers regard the risk of informal social sanctions as far more salient and economically threatening than even the risk of regulatory penalties.” Coglianese & Kagan, *supra* note 188, at xxii.

formality and factional control.²³² In Barbara Cherry's language, we need "regulatory resilience."²³³

At their heart, institutions are about power, "the capacity to affect others to get the outcomes one wants."²³⁴ However, as Joseph Nye has taught us, relying solely on the direct use of force—in his case, military power—can be costly and potentially dangerous. Nye introduced the concept of "soft power"—relying on diplomacy and cooperation—as compared to the more traditional "hard power" of military force.²³⁵ From an institutional vantage point, we can interpret Nye's "hard power" approach as relying primarily on the government's ability as a political entity to bring formality, rigidity, coercion, accountability, and enforceability to a situation.²³⁶ For our purposes, one can draw a parallel between "hard" public policy, typically traditional laws and regulations, and the "softer" institutions that by varying degrees are less formal or coercive.

The diagram below shows the public/private space occupied by certain policy institutions. The inverted pyramid illustrates the key trade-offs involved in selecting certain forms of authority over others, as well as the market's increasing reliance on more informal institutions. The diagram reveals, for example, how shifting further up the institutional stack, away from the more rigid and politicized laws and regulations, comes at the expense of losing some elements of coercion and accountability.

232. See STONE, *supra* note 55, at 235 (commenting that "[t]he most important problem in the design of rules is the tension between precision and flexibility"). To Bromley, "the real dynamism of democratic capitalism is that the existing institutional arrangements are regarded as the indispensable malleable architecture for adaptation." BROMLEY, *supra* note 48, at 74.

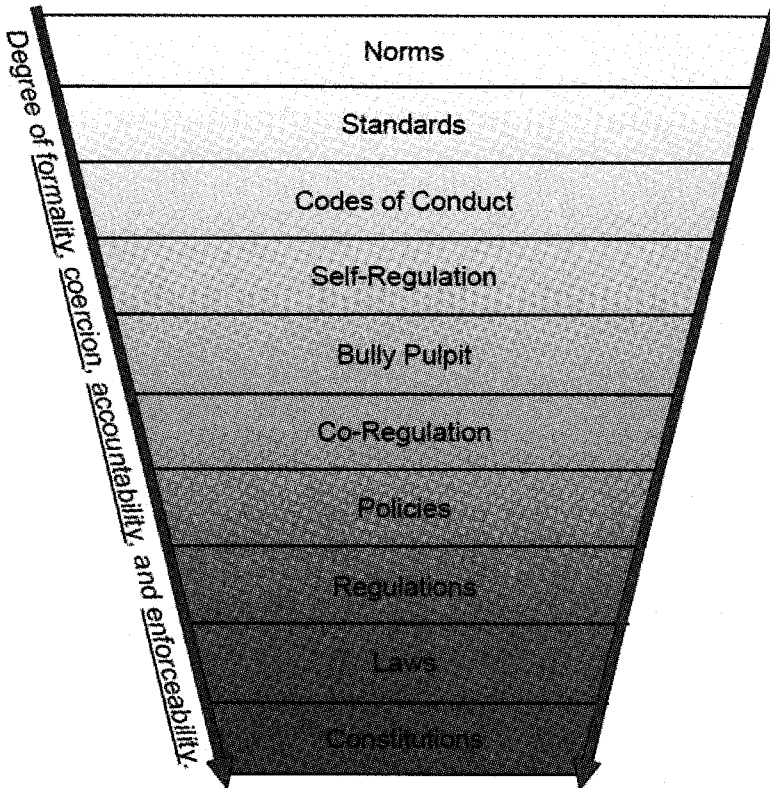
233. Cherry, *supra* note 151, at 2.

234. Interview by Peer Schouter with Joseph S. Nye Jr., Theory Talk #7: Joseph Nye on Teaching America to be More British 2 (May 15, 2008), available at http://theorytalks.fileave.com/TheoryTalk7_Nye.pdf.

235. Joseph S. Nye Jr., *Soft Power*, FOREIGN POLICY, Fall 1990, at 153.

236. While Nye does not use these precise words in describing "hard power", I argue that the use of military force and other aggressive actions clearly involve each of these concepts in some way.

Institutions: An Inverted Pyramid of Options



According to some commentators, relying on more collaborative administrative regimes with supportive stakeholders “increase[s] creativity, improve[s] implementation, and heighten[s] democratic participation.”²³⁷ On the other hand, some argue that such projects will lack legitimacy because the stakeholders’ self-interests undermine such collaborative endeavors, compared to a rule-bound, deterrence-based system.²³⁸ The challenge is to balance the flexibility and adaptability of soft power solutions, with legitimacy and accountability (by both policymakers and economic actors), and the potential for enforceability of hard power solutions. As one pair of researchers summarizes it:

237. Donald T. Hornstein, *Complexity Theory, Adaptation, and Administrative Law*, 54 DUKE L.J. 913, 949-50 (2005).

238. *Id.* at 950-51. Of course, in retrospect, placing trust in financial bodies to develop, on their own, the appropriate standards for lending money—from financial derivatives to home loans—was a colossal mistake, one from which we undoubtedly will be learning for many years.

The implication for newer approaches to regulation seems clear. At the same time that these approaches temper the rigidity that can accompany conventional regulatory strategies, they present particular needs for effective monitoring and enforcement since they are being used, inherently, in contexts where firms' private interests do not comport completely with the overall demands society places on business.²³⁹

There are a number of important considerations when addressing this public/private space. An initial issue is generating the desired level of accountability, both for public and private agents. For example, what recourse does an economic agent have if a government official is using "soft power"—such as the bully pulpit described above—in an attempt to coerce certain market behavior from that agent? Appellate courts normally would deny review because of the amorphous and informal nature of the coercion. On the other hand, it would be far too legalistic and burdensome to establish a formal review mechanism for such informal actions. Of course, soft power can work both ways, so economic agents have the ability to use the same types of informal institutions to push back on or persuade the government agents.

A second significant issue is making policies more adaptable. "[I]nstitutional change is much slower and culturally more complex than technological or economic change," and includes "[o]vercoming the inertia of vested interests, long-held . . . dogmas, cultural views, practical routines and ingrained habits."²⁴⁰ As a result, "when we can only guess at the extent of our ignorance, realizing that we are almost certain to be confronted with unknown unknowns, it makes sense to build buffering capacity into our institutions: that is, to give them the slack and resources they need to respond to surprises."²⁴¹ Institutions should be powerfully shaped by practical skills, to be "multifunctional, plastic, diverse, and adaptable."²⁴² Conversely, laws and "regulations that are too blunt and inflexible could create additional costs that other measures might avoid while still achieving the [policy] goals [and objectives]."²⁴³

239. Coglianese & Kagan, *supra* note 188, at xxvi.

240. CARLOTA PEREZ, TECHNOLOGICAL REVOLUTIONS AND FINANCIAL CAPITAL: THE DYNAMICS OF BUBBLES AND GOLDEN AGES 165 (2002).

241. HOMER-DIXON, *supra* note 64, at 290.

242. SCOTT, *supra* note 30, at 353. Atkinson points out how new growth theory "suggests that the development of new institutions to boost innovation will require both experimentation and evaluation of public policies as we attempt to find our way in this new era of knowledge-based economics." ATKINSON, *supra* note 49, at 248. After all, "innovation takes place in the context of institutions and as such shifts the focus of economic policy toward creating an institutional environment that supports technological change, entrepreneurial drive, and higher skills." *Id.* Thus, "a host of new policy tools can boost productivity and innovation." *Id.* at 249.

243. ATKINSON & AUDRETSCH, *supra* note 4, at 23.

A related adaptability problem is what has been called the social acceleration of time.²⁴⁴ William Scheuerman posits that the technological changes brought about by broadband networks and the Internet, “represent[] the most obvious manifestation of a broader set of social and economic trends having far-reaching implications for the temporal horizons of human existence.”²⁴⁵ His thesis is that many traditional notions about liberal democracy, including the separation of powers between executive, legislative, and judicial branches, rest on assumptions about temporality, which become increasingly problematic with the heightened pace of modern social life. In particular, social acceleration undermines the role of elected legislatures vis-à-vis powerful executives and courts. To Scheuerman, the challenge is to establish “[a] viable political system, outfitted with [institutions that allow] rich possibilities for freewheeling deliberation and inclusive interest representation.”²⁴⁶ One possible implication is that we should rely more on softer power institutions, like norms, over laws, because the former are more decentralized and adaptable to change.²⁴⁷

A third issue is fostering market incentives. To Paul Romer, the “most important job for economic policy is to create an institutional environment that supports technological change.”²⁴⁸ The rule of law and informal norms can ensure that productive economic behavior will be rewarded.²⁴⁹ Aligning market incentives involves a mix of pecuniary self-interest, non-pecuniary self-interest, and third-party interest. Raising trust levels also raises the possibility of mutually beneficial arrangements and their economic predictability. The ultimate goal is for the adaptive policymaker to find potential mutuality of interests between disparate market agents.

A fourth issue is dealing with the echoes of the past. Public and private “players [alike] are constrained by path dependence—the limits to choices arising from the combination of beliefs, institutions, and artifactual

244. SCHEUERMAN, *supra* note 66.

245. *Id.* at xiii.

246. *Id.* at 195; *see also* Cherry, *supra* note 151, at 19-21 (stating that social acceleration undermines the rule of law and threatens liberal democracy).

247. *See* SCHEUERMAN, *supra* note 66, at 209-17.

248. Paul M. Romer, Address at the Stanford Alumni Assoc. Conf. in London, Beyond Classical and Keynesian Macroeconomic Policy (Apr. 5 1997) (transcript available at http://www.gsb.stanford.edu/research/faculty/news_releases/Romer.Paul/London_Speech.html); *see also* Paul M. Romer, *Beyond Classical and Keynesian Macroeconomic Policy*, POLICY OPTIONS, July-Aug. 1994, at 2, available at http://www.iisec.ucb.edu.bo/amercado/clases/macroeconomia_maestria/lecturas/Beyond_classical_and_keynesian_macroeconomic_policy.pdf.

249. WILLIAM J. BAUMOL, ROBERT E. LITAN & CARL J. SCHRAMM, GOOD CAPITALISM, BAD CAPITALISM, AND THE ECONOMICS OF GROWTH AND PROSPERITY 48-52 (2007).

structure that have been inherited from the past.”²⁵⁰ Path dependency is an enduring lesson derived from studying the past.²⁵¹ In the case of laws, for example, we can see that legal path dependencies serve as a selection and retention mechanism which can lead to lock-in effects, preventing the future application of superior legal rules.

Thus, by balancing these and other considerations, we should be able to sketch out the right institutional framework to drive innovation and economic growth. Paul David has explored one possible avenue:

There is thus a case to be made for devoting greater attention to matching the technological innovations of the Internet by mobilizing other, nontechnologically implemented modes of regulation. Greater consideration surely is worth directing to the design of legal, political, and social rule structures and administrative procedures, of the kind that proved to be efficacious in supporting successful economic exploitation of previous technical advances in communications networks.²⁵²

b. The Organizational Platforms: Players of the Game

In addition to institutions (the rules of the political/economic game), we also have the entities which actually play the game. These players correlate to Kingdon’s “garbage can model of organizational choice,” which carries his conception of a process characterized by “organized anarchy.”²⁵³ As with institutions, I will provide only a brief overview of the identity and role of various organizations, with an emphasis on what some have called the “political market.”

i. Organizations Defined

Organizations are groups of individuals bound together by a common purpose to achieve certain agendas. To some, organizations comprise a special kind of institution, with additional features including criteria to establish their boundaries, principles of sovereignty, and chains of command.²⁵⁴ In addition to government actors, they include political,

250. NORTH, *supra* note 151, at 80.

251. *Id.* at 77.

252. Paul A. David, *Economic Policy Analysis and the Internet: Coming to Terms with a Telecommunications Anomaly*, in THE OXFORD HANDBOOK ON INFORMATION AND COMMUNICATION TECHNOLOGIES 148, 164 (Robin Mansell, et al. eds. 2007).

253. KINGDON, *supra* note 124, *passim*. Kingdon sees organizations not as computers solving problems, but as garbage cans into which a mix of problems and possible solutions are poured. *Id.* One implication is that administrative decisions cannot be understood in purely rational terms, but rather in the three process streams and their precise mix in the garbage can. *Id.*; see also G. David Garson, “Garbage Can” Models: Multiple Stream Theory, <http://faculty.chass.ncsu.edu/garson/PA765/garbagecan.htm> (last visited Apr. 18, 2009).

254. Hodgson, *supra* note 168, at 8.

social, and educational bodies, like corporations, political parties, law firms, trade unions, and universities.²⁵⁵ Much like institutions, organizations run the gamut from formal to informal, accountable to non-accountable, fixed to flexible.

Each organization is its own complex adaptive system,²⁵⁶ which among other things means we should look beneath the surface to recognize the actions of the disparate players within. The treatment of an organization as a social actor should not ignore the potential conflict within the organization.²⁵⁷

The most important takeaway is that organizational perspectives dictate how one looks at a policy issue. Whether you are a corporate CEO, a public interest advocate, a political appointee chosen to run a government agency, or a career bureaucrat in that same agency, what you see depends on where you stand.

ii. Political Bodies as Organizations

Political bodies are an obvious player in the market. Government sets the ground rules, controls the subsidy and tax flows, and assigns the burdens of accountability. In the United States, the triumvirate consists of the legislative branch, the executive branch, and the judicial branch. Our republican form of government owes much of its intellectual origin to James Madison, who in *The Federalist No. 10*, explained how politics tend to be captured by “factions,” or special interests.²⁵⁸ Madison famously was deeply suspicious of the twin dangers of majority and minority tyranny in popular democracy, and called upon a republican form of government to protect the natural rights of citizens against both kinds of factions.²⁵⁹ Our three-headed system traces its intellectual origins as well to Madison’s concern about creating the checks and balances of political power.

Some believe the administrative apparatus—the federal bureaucracy—constitutes a fourth branch of government. Administering complex policies requires a wide variety of expertise, including

255. *Id.* at 9.

256. Eve Mitleton-Kelly, *Ten Principles of Complexity and Enabling Infrastructures*, in COMPLEX SYSTEMS AND EVOLUTIONARY PERSPECTIVES ON ORGANISATIONS: THE APPLICATION OF COMPLEXITY THEORY TO ORGANISATIONS 23 (Eve Mitleton-Kelly ed., 2003).

257. Hodgson, *supra* note 168, at 10.

258. THE FEDERALIST NO. 10 (James Madison).

259. JERRY L. MASHAW, GREED, CHAOS, AND GOVERNANCE, 7-8 (1997). For an entertaining and illuminating account of how democracy can be viewed as serving the same function in political systems that sexual reproduction serves in biological systems—enhancing resistance to parasites—see Glenn Harlan Reynolds, *Is Democracy Like Sex?*, 48 VAND. L. REV. 1635 (1995).

technological, commercial, financial, and administrative skills.²⁶⁰ Various public sector organizations have different capabilities based on constitutional differences, power relations between various special interest groups, quality of civil servants, and accountable “learning by doing” in operating specific policy instruments.²⁶¹

In addition to the federal government, we also have the states, counties, cities, municipalities, and other smaller political bodies. While beyond the scope of this Article, it is worth noting that to Professor Barbara Cherry, the reality of social acceleration should lead us to approach the concept of federalism with fresh eyes.²⁶² In particular, Cherry argues that “further evolution in the federalism regime is required to improve the adaptive properties of the U.S. policymaking processes to provide sustainable telecommunications policies.”²⁶³ So the allocation of authority to political organizations—between federal and state agents—still should presume a sharing of regulatory power between federal and state governments, and preserve a role for local and regional experimental behavior.²⁶⁴

iii. Corporations as Organizations

A corporation is a creature of the state, given the legal fiction of an artificial person. “A corporation has no individual corporeal existence.”²⁶⁵ Originally, corporations were formed in the United States by state governments to undertake tasks that appeared too risky or expensive for individuals or governments. State governments created corporations and gave them special legal status.²⁶⁶ With their original purpose eventually disappearing, corporations became more popular as a means of reducing

260. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 522.

261. *Id.* at 521-22.

262. Cherry, *supra* note 151, at 25-26.

263. Barbara Cherry, *The Telecom Economy and Regulation as Coevolving Complex Adaptive Systems*, 59 FED. COMM. L.J. 369, 372 (2007).

264. Others suggest this sharing should not extend to ceding exclusive rights to the states, given the “exploration/exploitation” dilemma. There is a tension between copying tested strategies and the search for better, untested strategies. Based on this view, devolution to the states does not always increase variance, leading to better solutions. Overall, we should prefer the “fallback” of minimum federal standards (exploitation), while allowing searches for different approaches (exploration). See Donald T. Hornstein, *Complexity Theory, Adaptation, and Administrative Law*, 54 DUKE L.J. 913, 941-43 (2005).

265. Tamara R. Piety, *Market Failure in the Marketplace of Ideas: Commercial Speech and the Problem That Won't Go Away*, 41 LOY. L.A. L. REV. 181, 201 (2008).

266. Richard Calland, *Prizing Open the Profit-Making World*, in THE RIGHT TO KNOW 214, 217 (2007).

transaction costs.²⁶⁷ Corporations now exist primarily to create wealth for their shareholders.²⁶⁸

Despite the fact that corporations are not natural persons, the Supreme Court granted them rights under the Constitution as human beings, beginning in 1886 with *County of Santa Clara v. Southern Pacific Railroad Co.*²⁶⁹ The right to free speech amounts to the right to contribute money to politicians and parties, and, in essence, to create what can be called a political market. By treating corporations as natural persons, one significant implication is that we have granted them political power they otherwise would not be able to exercise.

The easy assumption is that only the government can be a hierarchy, and thus improperly attempt to impose ill-fitting, top-down solutions on the market. Yet, corporations too are hierarchies, with similar constraints about reaching and imposing flawed judgments.²⁷⁰ It may even be dangerous to assume that companies behave “rationally,” since the interests of owners, managers, employees, and shareholders do not always align.²⁷¹ Regulation can be public or private, and the impact on other agents in the market can

267. See, e.g., Coase, *supra* note 163 (the existence of transaction costs led to the emergence of the firm).

268. Some have suggested changing the ways that corporations operate, by redefining their purpose as “harness[ing] private interests to serve the public interest.” Corporation 20/20, <http://www.corporation2020.org> (last visited Apr. 18, 2009). Corporation 20/20 is an organization seeking to “embed social purpose in the organizational ‘genetics’ of corporate structure.” Corporation 20/20: Designing for Social Purpose, http://www.corporation2020.org/overview_setting_stage.htm (last visited Apr. 18, 2009)).

269. 118 U.S. 394 (1886). After years of declining to address the question, the U.S. Supreme Court concluded that corporations are persons within the intent of the Equal Protection Clause of the Fourteenth Amendment to the Constitution. A recent book points out the mysterious circumstances under which Chief Justice Waite had that language inserted into the headnotes of the case (and not the text of the decision itself). See THOM HARTMANN, *UNEQUAL PROTECTION: THE RISE OF CORPORATE DOMINANCE AND THEFT OF HUMAN RIGHTS* (2002). The way in which today’s assumptions about the powers of the corporation rest on the somewhat shaky ground of history should remind us of the path-dependency discussion in the previous section.

270. In terms of complexity theory, companies are emergent entities which cannot totally be described in terms of their stakeholders (management, shareholders, and customers).

271. See BOOKSTABER, *supra* note 15, at 239-40. In a classic work of political science, two analysts examine the Cuban Missile Crisis through the lenses of three different policy models and their presumptions: the Rational Actor Model (unitary, deliberate choice), the Organizational Behavior Model (organizational behavior and outputs), and the Government Politics Model (bargaining games among political players). GRAHAM ALLISON & PHILIP ZELKOW, *ESSENCE OF DECISION: EXPLAINING THE CUBAN MISSILE CRISIS* (2d ed. 1999). The authors conclude that while the models provide three different explanations of the same happening, at another level the conceptual “lenses” employed with each model produce quite different occurrences, influencing “the character of the analyst’s puzzle, the evidence assumed to be relevant, the concepts used in examining the evidence, and what is taken to be an explanation.” *Id.* at 387-88. We should be equally cautious about assuming certain behaviors in the context of large corporations.

be much the same: constraints on the freedom of choice and action. Corporations serve as private sector hierarchies when they provide a “visible hand” in making a myriad of economic decisions.²⁷² Ideally, as Beinhocker puts it, the evolutionary process then eventually “filters up into the ‘thin layer’ of the market,” where Adam Smith’s “invisible hand” (or, in this Article’s language, the evolutionary algorithm) can provide the final word on selecting and amplifying business plans.²⁷³

However, a modern day corporation usually is highly centralized, and can, at best, only incompletely mimic the forces of the market. Such corporations survive and even flourish because, in part, it tends to be less expensive to run a hierarchy than to try to use the entire market.²⁷⁴ In the context of corporations as economic agents, the saving grace is the incentives provided by the market itself. Subject to market forces of competition and innovation, successful corporations have no choice but to respond accordingly. The market disciplines the behavior of the corporation.²⁷⁵ As Paul Romer put it, “[n]o system of comprehensive central planning, neither one controlled by a government, nor one controlled by the managers of a single firm, can hope to be as robust and reliable a mechanism as competition among many actual and potential firms for purchases by final users.”²⁷⁶ Nonetheless, when those market forces are artificially constrained or even removed, a firm may be no better positioned than a state when it comes to creating—and destroying—economic value.²⁷⁷

iv. Other Organizational Bodies

In discussing organizations that wield institutional authority, the tendency is to focus on political and corporate entities. Yet there are other

272. Alfred Chandler introduced the notion of large vertically integrated companies employing the “visible hand” of management, replacing the “invisible hand” of the market. ALFRED D. CHANDLER, JR., *THE VISIBLE HAND, THE MANAGERIAL REVOLUTION IN AMERICAN BUSINESS* (1977).

273. BEINHOCKER, *supra* note 10, at 422.

274. JOHN McMILLAN, *REINVENTING THE BAZAAR: A NATURAL HISTORY OF MARKETS* 168-70 (2002).

275. One sociologist posits that the primary mechanism regulating a firm’s behavior is not price competition, but the “search for stable interactions with competitors, suppliers, and workers.” Under this Darwinian-sounding view, profit maximization is replaced by promotion of the firm’s survival in an uncertain environment. See FLIGSTEIN, *supra* note 46, at 16-18.

276. Test. of Paul Romer, *United States v. Microsoft Corp.*, Civil Action No. 98-1232, at 8 (D.D.C. 2003), available at <http://www.usdoj.gov/atr/cases/f219100/219128.htm>.

277. In addition, firms themselves have path-dependent trajectories. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 77-82. As we shall see in Part V.B., this observation calls for a public policy that introduces additional economic inputs and incentives to incite a pluralism of market choices.

types of relevant bodies as well. Self-regulating organizations (SROs) are established by industry sectors, usually to promulgate voluntary regulations or codes of conduct.²⁷⁸ Standards bodies like the IEEE also occupy this space. The Internet Corporation for Assigned Names and Numbers (ICANN) is an interesting example of an entity that professes to operate outside the ordinary public policy realm, as a “not-for-profit public-benefit corporation,” but until recently was under the imprimatur of the United States.²⁷⁹ Self-described public interest organizations also provide a voice for those who seek a more robust place for the “public interest” in economic activity. Once one pays attention to the activities that support innovation, for example, a number of non-market organizations (e.g., universities and government research and development support programs) are involved along with market organizations.²⁸⁰

It should be noted that while less formal organizations, such as user groups, normally cannot generate more formal, coercive, and accountable institutions, such as laws, the reverse is not necessarily true. This observation can be one key to the flexibility of adaptive policymaking.

v. Political Markets: Where Private and Public Agents (Supposedly) Collide

Democracy is an evolving system of policy ideas, where one counts on the evolutionary workings of the democratic process to select and amplify those ideas that will best serve society.²⁸¹ Democracy itself is based on the premise that the common sense of its citizens “should, in mediated form, continually modify the laws and policies of the land.”²⁸²

Nonetheless, political markets are inherently imperfect. Indeed, “[m]arket failure is to be expected in public policy markets too.”²⁸³ Some argue that political markets tend to be less efficient than economic markets.²⁸⁴ For example, Coase believes that there are government failures

278. For a detailed assessment of the spectrum of self- and co-regulatory bodies in the Internet space, see JONATHAN CAVE, CHRIS MARSDEN & STEVE SIMMONS, RAND EUROPE, OPTIONS FOR AND EFFECTIVENESS OF INTERNET SELF- AND CO-REGULATION (2008), available at www.rand.org/pubs/technical_reports/2008/RAND_TR566.pdf (presenting twenty-one separate case studies across the range of SROs).

279. See Internet Corporation for Assigned Names and Numbers, <http://www.icann.org/en/about/> (last visited Apr. 18, 2009).

280. Nelson, *supra* note 176, at 5.

281. BEINHOCKER, *supra* note 10, at 450.

282. SCOTT, *supra* note 30, at 357. By the same token, “institutional change is best understood as the essence of public policy” – that is, “thinking about, weighing, and ultimately choosing among alternative institutional setups that will give rise to alternative imagined and plausible futures.” BROMLEY, *supra* note 48, at 72.

283. MASHAW, *supra* note 259, at 11.

284. NORTH, *supra* note 151, at 54-55.

as well as market failures, and that the choice between markets and institutions shall depend on a detailed study of the opportunity costs in each specific case.²⁸⁵ North similarly observes that “political markets reflect imperfect knowledge between principals and agents, and are typically characterized by high [transaction costs].”²⁸⁶ The dilemma, he says, is that “the government is not a disinterested party in the economy.”²⁸⁷ Seen from this perspective, the result is that changes in laws or regulations do not always lead to “efficient” outcomes.²⁸⁸

Mancur Olsen believes that policy decisions can be explained by looking at politics as a competition between the private interests of specific groups, rather than as a process for delivering the public interest.²⁸⁹ In the process of institutional change, the winners and losers (the demand side of legislation) each have incentives to lobby government (the supply side) in a bargaining process. Changes in either demand or supply side forces will result in institutional change.²⁹⁰ Consumers, citizens, and users tend not to be as effective in this bargaining process. Consumers, in particular, generally are unaware of possible policy moves (informational issues), can be unwilling to act because they approve of the process (if not the outcome), have difficulties taking collective action, and/or have insecure political rights.²⁹¹ The result is a system where the large and well-organized players usually trump all others.

Public choice theory (or “positive political theory”) adopts this view of the political market as akin to the competitive struggles of the economic market.²⁹² First propounded by James Buchanan, Gordon Tullock, Kenneth Arrow, and George Stigler, the theory posits that different incentives and processes operate when goods are sold through political means rather than through purely economic means.²⁹³ The political appropriation and distribution of goods is attractive because it concentrates its benefits and disperses its costs. The few become active partners of their own benefits, to

285. COYLE, *supra* note 156, at 210.

286. NORTH, *supra* note 151, at 79.

287. *Id.* at 67.

288. Eckardt, *supra* note 96, at 441.

289. See MANCUR OLSEN, *THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS* (rev. ed., 1971).

290. Alston, *supra* note 174, at 9.

291. *Id.* at 26.

292. Political choice theories are based on Schumpeter's idea of democracy as competition for political power. See, e.g., Eckardt, *supra* note 96, at 443.

293. William F. Shughart II, *Public Choice*, in *THE CONCISE ENCYCLOPEDIA OF ECONOMICS* (2008), <http://www.econlib.org/library/Enc/PublicChoice.html>.

the detriment of the many whose wealth is tapped. Politicians hear nothing from the many, and much from the few.²⁹⁴

The logic of collective action leads to “rent seeking,” where beneficiaries seek financial advantage on the basis of their participation in a certain interest group.²⁹⁵ Economic distribution of benefits works in a fashion opposite from political rents; the benefits go to the many and the costs are concentrated on the few in the free market. Where the costs to organize the general citizenry are high, and the costs to organize “factions” are low, special interest legislation tends to be prevalent. This particular variation of the “Prisoner’s Dilemma,” the best known game of strategy in social science,²⁹⁶ states that all are compelled to participate in the political process because the best outcome—everyone else should give up rent seeking—will not happen.

“Public choice theory conveys the message that political institutions are imperfect for many of the reasons that markets are imperfect: [including] asymmetric information, transactions costs, [and] free-rider problems.”²⁹⁷ As Eckardt explains:

[T]he selection mechanisms of the legislative system limit the variety of viable statutory innovations. The rules laid down by the constitution define the relevant political selection environment. They determine what kind of problems can be treated by legislation and what actors are formally involved.²⁹⁸

Further, all policies and programs are liable to be captured by their administrators, clients, and politicians, all of whom seek to run them for their own benefit.²⁹⁹

If this is a true representation of the political market, public choice theory yields an especially pessimistic perspective for innovation policy. After all, “future industries and innovators do not have a seat at the

294. Adam Smith himself articulated his skepticism about the motives of government policies that interfere with the operation of the market, based on the view that economic policies are dominated by “merchants and master manufacturers. . . . To widen the market and to narrow the competition is always the interest of the dealers.” ADAM SMITH, 1 AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS 266-67 (4th ed., 1776).

295. Shughart, *supra* note 293, at 3; *see also* The Language of Economics – Dictionary and Research Guide, <http://www.123exp-business.com/economics/> (search “rent-seeking”) (last visited Apr. 18, 2009) (in rent-seeking, firms seek to profit through manipulation of the economic environment rather than through trade and the production of added wealth).

296. *See* Avinash Dixit & Barry Nalebuff, *Prisoners’ Dilemma*, THE CONCISE ENCYCLOPEDIA OF ECONOMICS (2d. ed., 2008), <http://www.econlib.org/library/Enc/PrisonersDilemma.html>.

297. J. Gregory Sidak, *The Dismal Science of Law*, 1992 PUB. INT. L. REV. 121, 124 (1992).

298. Eckardt, *supra* note 96, at 461.

299. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 535.

lobbying table, as they either do not exist or exist in only nascent form.”³⁰⁰ This is problematic because small entrepreneurial firms are most likely to be the source of disruptive innovations, and yet have little ability to influence the political process. By contrast, “large incumbents are generally better organized and have more lobbying clout than upstarts,” giving incumbents a disproportionate influence over innovation policy.³⁰¹

Public choice theory opens up for debate important questions, such as “the motivation of politicians and officials, the importance of incentives in public life as well as private choice, the influence of special-interest groups, and ultimately the broad question of how our collective political institutions shape economic outcomes.”³⁰² Nonetheless, the overall vision painted is particularly grim: “a world of greed and chaos, of private self-interest and public incoherence . . . a vision that makes all public action deeply suspect.”³⁰³ The result, some suggest, is the notion that “no appealing version of democracy is possible and that no possible version is very appealing.”³⁰⁴

And yet, does public choice theory adequately and fully explain all political activity? For example, is legislation simply a commodity to be bought and sold as a means of placating interest groups? Public choice theory says yes, but this ignores other possible factors, including the legislator’s pre-existing belief system and/or a desire to provide constituent services. Kingdon, for one, insists that the content of ideas is an integral part of government decision making, and prevails on its own merits, rather than through political pressure.³⁰⁵ Stone agrees. “Political fights are conducted with money, with rules, with votes, and with favors, to be sure, but they are conducted above all with words and ideas.”³⁰⁶

300. Benjamin & Rai, *supra* note 40, at 141. As Schumpeter put it: “Technological change involves substantial losses sustained by those who own specific assets dedicated to the existing technology.” ATKINSON, *supra* note 49, at 192 (quoting Joel Mokyr, *Cardwell’s Law*, 23 RESEARCH POL’Y 561, 564 (1994) (quoting Joseph A. Schumpeter)); see also JOEL MOKYR, *THE GIFTS OF ATHENA: HISTORICAL ORIGINS OF THE KNOWLEDGE ECONOMY* 220 (2002) (throughout history, technological progress runs into a powerful foe in the incumbents’ “purposeful self-interested resistance to new technology.”)

301. Benjamin & Rai, *supra* note 40, at 113.

302. COYLE, *supra* note 156, at 208.

303. MASHAW, *supra* note 259, at 4.

304. *Id.* at 12.

305. KINGDON, *supra* note 124, at 125. The author continues:

The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed, the world is ruled by little else. . . . I am sure that the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas.

Id. (quoting JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST, AND MONEY* 383 (1936)).

306. STONE, *supra* note 55, at 34.

Moreover, some point out that, while tunnel vision and bad faith by policymakers never can be discounted, “empirical evidence does not support the extreme vision of some public choice theorists—that government officials will always do the bidding of powerful interests who supply them with money, clout, or whatever they maximize.”³⁰⁷ To the contrary, there is strong evidence that successful lobbying is “more often about activating a legislator who already agrees with the lobbyist than about persuading undecided legislators or bringing around legislators who were initially opposed.”³⁰⁸ Gaining political attention by framing an issue a certain way undoubtedly involves the exercise of power,³⁰⁹ but influence is not quite the same thing as control.³¹⁰

Public choice theory is based on traditional neoclassical economics, and a conventional model of collective action which says that citizens are merely self-interested wealth maximizers, organizing themselves into interest groups for the purpose of extracting rents from the government.³¹¹ Obviously there is some truth to that observation, if not the theoretical grounding. But the politics inherent in policy can run the other way as well. As Dan Kahan demonstrates, for example, the behavior of elected officials tends to be “limited by informal norms that discourage unconstrained efforts to redirect public resources toward one’s own constituencies.”³¹²

Just as large corporations are not the sum total of economic life, government is not the sum total of political life. One open question is whether Madison’s checks-and-balances system should be updated to benefit today’s imperfect economic and political markets, especially in a society no longer rooted in agrarian life. Beyond Madison’s formal application of checks-and-balances, perhaps we need informal constraints that will redirect behavior to produce more felicitous outcomes.³¹³ A possible approach is to engage a third political force as a check against

307. Benjamin & Rai, *supra* note 40, at 163. Bromley refers to “the dimwit conjecture” as the assumption that politicians by definition “are not amenable to reason and rational thought about important social problems.” BROMLEY, *supra* note 48, at 124. He further observes that there are many legitimate reasons for particular political actions, only some of which pertain to achieving economic efficiency. *Id.* at 119.

308. MCFARLAND, *supra* note 124, at 139–40.

309. *Id.* at 140.

310. *Id.*

311. Eckardt, *supra* note 96, at 440.

312. Dan M. Kahan, *The Logic of Reciprocity: Trust, Collective Action, and Law, in MORAL SENTIMENTS AND MATERIAL INTERESTS: THE FOUNDATIONS OF COOPERATION IN ECONOMIC LIFE* (Herbert Gintis, et al., eds.) 339, 364 (2005). Kahan also warns that policies designed to frustrate public choice pressures may be counterproductive because they also indicate that we expect political actors to engage in such behavior. *Id.*

313. NORTH, *supra* note 151, at 68.

government and corporate factions, consisting of individual users (in economic markets) and individual citizens (in political markets). From this insight there are two general pathways forward: elevating that new faction by adding it to the current mix in a more organized and influential manner, or lowering the old factions by bringing government and corporations down further to the level of individual citizens/consumers. A mix of both options can be explored as well.

In the spirit of creating and elevating a new faction, several commentators have discussed concrete ways for the federal government to make innovation a centerpiece of our policymaking agenda.³¹⁴ Of course, as we have just seen, the institutions and organizations one utilizes are critical to the success of the endeavor. As one example, author John Kao has suggested that the United States needs to embrace innovation as a key national priority. He suggests various governmental mechanisms to enable it, such as a National Innovation Advisor, a National Innovation Council, and an Office of Innovation Assessment.³¹⁵ While a laudable goal, it is not just a matter of layering this concept onto the existing institutions and organizations—the federal bureaucracy—and expecting it all to succeed. The “innovation agenda” deserves some novel thinking about the appropriate ways to mold the government’s infrastructure and processes to best achieve our goals and objectives.³¹⁶

3. The Which, When, and Where: A Toolkit of Frames, Models, and Tools

In the world of adaptive policymaking, we have institutions and we have organizations. The next pieces of the puzzle are the various methods that the players use to carry out their policy goals and objectives. In the following policy design space, they are referred to as the *which*, *when*, and *where* elements, which amount to the mental screens necessary to assess one’s constraints and opportunities in the marketplace. These

314. See, e.g., ROBERT ATKINSON & HOWARD WIAL, BOOSTING PRODUCTIVITY, INNOVATION, AND GROWTH THROUGH A NATIONAL INNOVATION FOUNDATION (2008) (paper for the Brookings Found. & Info. Tech. & Innovation Found.), available at <http://www.itif.org/files/NIF.pdf>; see also Benjamin & Rai, *supra* note 40, at 114.

315. JOHN KAO, INNOVATION NATION: HOW AMERICA IS LOSING ITS INNOVATION EDGE, WHY IT MATTERS, AND WHAT WE CAN DO TO GET IT BACK 217-37 (2007).

316. Similarly, Robert Atkinson and Howard Wial have promoted the concept of establishing a National Innovation Foundation. ATKINSON & WIAL, *supra* note 314. However, they caution appropriately that this new body would neither run centrally-directed industrial policy, nor give out “corporate welfare,” but instead would work cooperatively with various agents “to foster innovation that would benefit the nation but would not otherwise occur.” *Id.* at 41. For a different yet equally thoughtful approach, see Benjamin & Rai, *supra* note 40, at 14-79 (proposing a new, trans-agency executive entity with authority to compel other government agencies to consider innovation as a policy priority).

cognitive frames, maps, and worldviews are conceptual “tools,” best used to understand or interpret the moves of others.³¹⁷ A key point is to be open to many options; after all, a toolbox containing only wrenches may be full, but it is not optimal. Three categories of useful implements in the “adaptive toolkit” will be introduced here: conceptual frames, models of imagined futures, and enabling tools.³¹⁸

a. *Conceptual Frames*

Owen Jones reminds us that “[r]eality is notoriously impervious to taxonomy.”³¹⁹ Nature stubbornly refuses easy classification and stratification, and yet we humans have little choice but to pursue that treacherous path. Most people think about the world largely in terms of implicit conceptual models that have significant consequences for the content of their thought.³²⁰ The totality of assumptions in a person’s mind constitutes his or her “reality model.”³²¹ We are born organizers, bent on conceptually slicing and dicing our way through life in bite-sized chunks, separating out the me from the we, and the market from the state. And yet, while it is true that more is different, it is far too easy to give in to the temptation to treat different aspects of life as if they never touch:

Categories are human mental constructs in a world that has only continua. They are intellectual boundaries we put on the world in order to help us apprehend it and live in an orderly way. . . . [W]e can know reality only by categorizing it, naming it, and giving it meaning. . . . [N]ature doesn’t have categories; people do.³²²

As we put together our adaptive policy toolkit, first it will be useful to equip ourselves with conceptual frames to make the task somewhat easier. Humans are literal creatures, and our adaptive brains cannot easily handle certain ways of thinking. Indeed, we have no choice but to construe the world by virtue of conceptual blends we achieve through biology and culture.³²³ When it comes to ways of understanding, “metaphors and stories

317. FLIGSTEIN, *supra* note 46.

318. Only recently have I discovered that Patricia Longstaff employed the “toolkit” metaphor back in 2002 to describe the various strategic “tools” that businesses and policymakers should utilize to better deal with issues in the communications sector. P.H. LONGSTAFF, *THE COMMUNICATIONS TOOLKIT* (2002). While the actual elements of our respective frameworks are dissimilar, her then-prescient reliance on complex systems, evolutionary theory, and the basics of network technology largely mirror the foundational structure of my own approach.

319. Jones, *Nature of Norms*, *supra* note 189, at 2072.

320. ALLISON & ZELIKOW, *supra* 271, at 3-4.

321. DIETRICH DÖRNER, *THE LOGIC OF FAILURE: RECOGNIZING AND AVOIDING ERROR IN COMPLEX SITUATIONS* 41 (Rita & Robert Kimer, trans., 1996) (1989).

322. STONE, *supra* note 55, at 378-79.

323. GILLES FAUCONNIER & MARK TURNER, *THE WAY WE THINK: CONCEPTUAL BLENDING AND THE MIND’S HIDDEN COMPLEXITIES* 390 (2002). “From weaponry to

are far more potent . . . [to us] than ideas.”³²⁴ “Metaphorical, [and] frame[s]-based . . . reasoning . . . developed in the course of human evolution to allow us to function as well as possible in everyday life.”³²⁵ As a result, “we are not manufactured . . . to understand abstract matters,” but instead crave the tangible and the palpable.³²⁶

The metaphoric language we have been employing is one such example. Talk of algorithms and environments, processes and platforms, makes it somewhat easier to conceptualize what is actually taking place when the micro-level activity of millions of human beings emerges into the macro-level activity of “the market.”³²⁷ The analogy of companies as persons has even become a legal doctrine.

Because our entire mental machinery (another metaphor) is embodied, we cannot think or speak without employing a vast array of mental models of the world.³²⁸ But we can use this fact to our advantage. The main value of conceptual models, Carlota Perez points out, is to serve as a tool “to help organize the richness of real life but not to hammer facts into tight boxes.”³²⁹ Political reasoning too is “metaphoric meaning,” part of a struggle to control which images of the world govern policy.³³⁰ Policymakers should use this vital knowledge to craft and utilize conceptual language that resonates with other market agents. Having “no more than a very blunt and fuzzy instrument . . . with which to ask

ideology, language to science, art to religion, fantasy to mathematics, human beings and their cultures have, step by step, made blends, unmade them, reblended them, and made new blends.” *Id.* at 396.

324. NASSIM NICHOLAS TALEB, *THE BLACK SWAN: THE IMPACT OF THE HIGHLY IMPROBABLE* xxviii (2007); see also RICHARD OGLE, *SMART WORLD: BREAKTHROUGH CREATIVITY AND THE NEW SCIENCE OF IDEAS* 61-64 (2007) (explaining that it is unavoidable that scientists use paradigms as frames or maps to make sense of the world, even if they both reveal and conceal).

325. GEORGE LAKOFF & MARK JOHNSON, *PHILOSOPHY IN THE FLESH: THE EMBODIED MIND AND ITS CHALLENGE TO WESTERN THOUGHT* 527 (1999).

326. TALEB, *supra* note 324, at 132.

327. As noteworthy examples already mentioned, John Kingdon describes setting political agendas as involving three policy “streams,” a “policy primeval soup,” and a “garbage can” model of organizations. KINGDON, *supra* note 124, at 16-17, 77-79, 116-17.

328. LAKOFF & JOHNSON, *supra* note 325, at 58-59. More problematically, when for example we see a nation as a coordinated, living human being, we rarely remember that we are reasoning by metaphor. ALLISON & ZELIKOW, *supra* note 271, at 402.

329. PEREZ, *supra* note 240, at 160.

330. STONE, *supra* note 55, at 381. “Political reasoning is reasoning by metaphor and analogy [and category-making]. It is trying to get others to see a situation as one thing rather than another”; it is a constant struggle over the criteria for classification, the boundaries of categories, and definition of ideals. *Id.* at 9, 11. Obviously this Article, and countless others, can be seen as a manifestation of this struggle.

questions and against which to assess regularity . . . is all that one can expect.”³³¹

b. Imagined Futures

Emergence Economics tells us that prognostication and planning are difficult, if not impossible, to get right. The inevitable personal limitations of information, perception, and cognition, coupled with a dynamic and unpredictable environment, makes failure far more common than success. Attempting long-range planning can also clash with the adaptive principle of making contextual, evidence-based decisions. Still, appreciating this reality should not lead to decisional paralysis. Those making public policy must do what they can to peer into the fog and discern some patterns that can help shape analysis. There are a number of possible ways to project into the present and future, using a mix of reason and imagination, to solve problems. I will briefly touch on three that are based more on policy option scenarios rather than outright predictions.

Peter Schwartz has devised what he calls “the art of the long view,” which is premised on developing and using scenarios to help cabin uncertainty and improve decision making.³³² This multi-stage process involves (1) identifying a focal decision, (2) listing the key factors influencing the success or failure of that decision, (3) listing the driving forces (social, economic, political, environmental, and technological) that influence the key factors, (4) ranking the key factors and driving forces based on relative importance and degree of uncertainty, (5) selecting the potential scenarios along a matrix, (6) fleshing out the scenarios, (7) assessing the implications, and (8) selecting leading indicators and signposts.³³³ An important takeaway here is that the use of scenarios can help identify the various environmental forces that can affect implementation of a policy decision, reducing to some degree the uncertainty that otherwise surrounds that process.

Closer to the near-term, Richard Ogle talks about utilizing “the idea-spaces of the extended mind,” which he identifies as including qualities like imagination, intuition, and insight.³³⁴ As Ogle sees it, reason proceeds cautiously and looks backward, while the imagination and its allied

331. PEREZ, *supra* note 240, at 161.

332. PETER SCHWARTZ, *THE ART OF THE LONG VIEW* (1996); *see also* NICOLAS C. GEORGANTZAS & WILLIAM ACAR, *SCENARIO-DRIVEN PLANNING: LEARNING TO MANAGE STRATEGIC UNCERTAINTY* (1995) (discusses Comprehensive Situation Mapping (CSM) as one form of scenario planning); GILL RINGLAND, *SCENARIO PLANNING: MANAGING FOR THE FUTURE* (2d. ed., 2006) (introduces scenario planning tools).

333. SCHWARTZ, *supra* note 332, at 241-47.

334. OGLE, *supra* note 324, at 6.

capacities look more boldly forward.³³⁵ More specifically, the Cartesian model of thinking is based on continuity, because logical and probabilistic reasoning cannot abide gaps.³³⁶ By contrast, creative breakthroughs typically involve leaps into the unknown.³³⁷ Because the imagination is the mind's supreme faculty for dealing with the future, and it reaches places where reason cannot go, Ogle suggests ways to harness the imagination to improve one's decision-making abilities.³³⁸ As Ogle quotes Einstein, "Logic will get you from A to B, imagination will take you everywhere."³³⁹

Finally, Thomas Homer-Dixon argues for the necessity to develop a "prospective mind . . . comfortable with constant change, radical surprise, and even breakdown."³⁴⁰ He sees each of these as inevitable features of our world, requiring us constantly to anticipate a wide variety of futures. "We need to exercise our imaginations so that we can challenge the unchallengeable and conceive the inconceivable."³⁴¹ He also argues: "Precise prediction is impossible because our complex and nonlinear world is full of unknown unknowns—things we do not know that we do not know."³⁴² But a mind open to numerous possibilities is better equipped to anticipate and deal with change than a mind closed off to such possibilities.

The figure below, then, is one way to combine these three approaches pictorially.

335. *Id.* at 113.

336. *Id.* at 23.

337. *Id.* at 19.

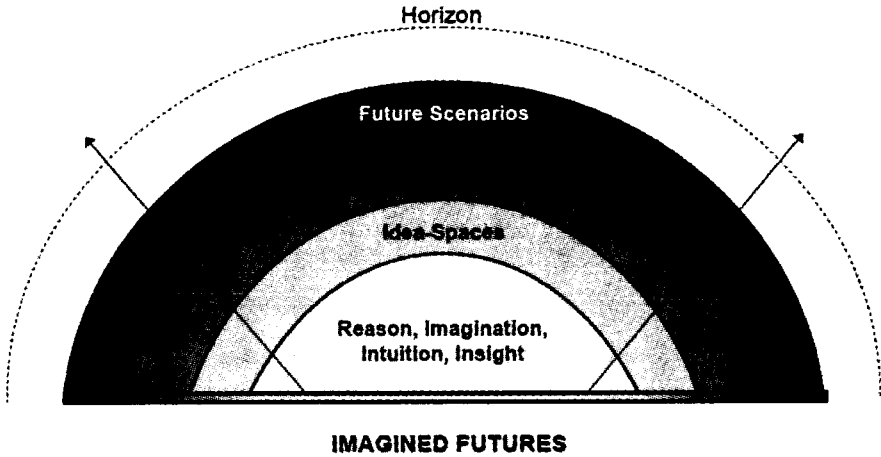
338. *Id.* at 113.

339. *Id.* at 249.

340. THOMAS HOMER-DIXON, *THE UPSIDE OF DOWN: CATASTROPHE, CREATIVITY, AND THE RENEWAL OF CIVILIZATION* 268 (2006).

341. *Id.* at 282.

342. *Id.* at 283. Interestingly, Homer-Dixon favors constructing more resilient, self-sufficient, distributed networks as a public good against the uncertainty of the future. *Id.* at 283-84.



c. *The Enabling Tools*

The adaptive toolbox also can contain the four “tinkering” tools introduced previously in *Emergence Economics*: feeding the evolutionary algorithm, fostering connectivity between agents, shaping the fitness landscape through incentives, and enhancing market feedback mechanisms.³⁴³ In Part V below, I will take a closer look at these enabling tools, and address some anticipated questions about their efficacy in particular situations.

4. The What: Projects

Finally, we have the operational end product, the specific output of the policy design space: the project.³⁴⁴ This element responds most directly to the *what* policy question, and mirrors Kingdon’s “policy primeval soup” of proposals.³⁴⁵ After all the analysis and debate, the project is where policy turns into concrete action. Ideally, each project should be a blend of techniques based on the projected best combination of institutional accountability, flexibility, and enforceability. Good projects also are context-specific and supported by a mix of theory, measurement, and subjective judgment.³⁴⁶

The best projects would be rooted in the nine adaptive policy principles suggested earlier.³⁴⁷ The way to construct and implement a project is to assess the evidence of the market landscape, and shape the

343. Whitt & Schultze, *supra* note 1, at 308-14.

344. The synonymous term “program” sounds too entrenched and long-term; “project” better connotes the more provisional nature that I am trying to emphasize.

345. KINGDON, *supra* note 124, at 116-17.

346. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 505.

347. See *supra* Parts III.B.1-9.

implementation to match the circumstance. If at all possible, projects should be limited by time and geography. In particular, use of the “sunset” approach, whereby programs automatically terminate after a certain period of time, compels policymakers to overcome the inevitable inertia of most government programs.³⁴⁸ Indeed, while from a public choice perspective it is almost impossible to stop entrenched interests from influencing policy outcomes, regular reappraisals of programs can shine helpful light, and give opportunities to weigh in on competing interests. Such pluralism is important as a means of exploring all possible avenues, plausible and otherwise.

IV. DEVISING A DESIGN SPACE FOR COMMUNICATIONS POLICY

In *Emergence Economics*, we suggested that newer and developing strands of economic thought can help us discover some conclusions about guiding goals and objectives for communications policy. In the dynamic and unpredictable processes of the market, communications policy stands out as having a profound impact on our economic—and overall—well-being.³⁴⁹

The case for a government technology policy requires accepting the proposition that it is socially desirable to attempt to influence the pace and/or direction of technological change.³⁵⁰ A set of optimal technology policies is not possible, given the conditions of uncertainty and endogenous change. Instead, policy must be based on a mixture of theory, measurement, and an unavoidable component of subjective judgment.³⁵¹ This is where the setting of goals and objectives enters the picture, premised in part on normative considerations.

As we have seen, technological, economic, and policy change coevolve in the larger social environment that binds us together as interacting human beings. As markets and technologies have their respective design spaces, so does public policy. We should see the policy realm much as we have described the economic realm. While there are “fundamental differences between markets and the political sphere,”³⁵² both share similar social elements. Both employ the evolutionary algorithm of variation-selection-amplification, and both collectively dictate the outcome

348. Some, like the Competitive Enterprise Institute, have even suggested sunseting the FCC itself. Clyde Wayne Crews, Op-Ed., *Sunset the FCC?*, WASH. TIMES (D.C.), Apr. 15, 2005, at A13 available at <http://cei.org/gencon/019,05273.cfm> (last visited Apr. 18, 2009).

349. Whitt & Schultze, *supra* note 1, at 290-91.

350. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 504.

351. See generally *id.* at 499-525.

352. Alexander Mingst, *Evolutionary Political Economy and the Role of Organizations 3* (Andrassy Univ. Working Paper Series No. XXII, 2008).

for the larger social environment.³⁵³ Where markets have an economic design space, comprised of Business Plans (BPs), Physical Technologies (PTs), and Social Technologies (STs) competing and adapting to the environment, the parallel is the “policy design space” (or Kingdon’s “garbage can” of choice³⁵⁴), comprised of various institutions, organizations, and tools—elements of the adaptive toolbox.

Obviously the communications policy space is an immensely complicated area, and a complex adaptive system in its own right. As a result, this Article will not address in great detail many facets of the system’s operation. Instead, it will focus on the components of the communications policy design space that can benefit most directly from the teachings of *Emergence Economics*, as well as the various non-pecuniary social benefits. In particular, the choices of institutions and tools by a policymaker like the FCC can have a profound impact on whether and how the normative policy goals and objectives actually are achieved in the marketplace.

A. *The Goal: More Good Ideas*

“Defining [positive] goals is the first step in dealing with complex situations.”³⁵⁵ Purely from an economic standpoint, the open dissemination of and access to information, particularly through the Internet, plays a critical role in innovation and economic growth. Virtually all countries benefit from new ideas created throughout the world. The open flow of information helps ensure that an idea engendered in one place can impact economies globally.³⁵⁶ Because of the nonrivalry and increasing returns on ideas, growth in the world’s stock of knowledge drives the underlying rate of growth in every country that is exposed to it. Ideas equal growth, and all its emergent benefits.³⁵⁷ As will be explained further below, one suggested policy goal generally applicable to the communications sector is “More Good Ideas.”

353. See generally Eckardt, *supra* note 96, at 457-58.

354. See KINGDON, *supra* note 124.

355. DÖRNER, *supra* note 321, at 43.

356. See generally Charles I. Jones, *Growth and Ideas* (Nat’l Bureau of Econ. Research, Working Paper No. 10767, 2004), in 1B HANDBOOK OF ECONOMIC GROWTH 1063, 1072 (P. Aghion & S. Durlauf eds., Elsevier 2005), available at <http://elsa.berkeley.edu/~chad/JonesHandbook2005.pdf>. Thomas Jefferson was prescient on this point. See Letter from Thomas Jefferson to Isaac McPherson (Aug. 13, 1813), in THE WRITINGS OF THOMAS JEFFERSON (Andrew Lipscomb & Albert Ellery Bergh eds., 1905), available at http://press-pubs.uchicago.edu/founders/documents/a1_8_8s12.html (Nature made it possible “[t]hat ideas should freely spread from one to another over the globe . . . like fire, expansible over all space, without lessening their density in any point, and like the air in which we breathe, move, and have our physical being, incapable of confinement or exclusive appropriation.”).

357. Whitt & Schultze, *supra* note 1, at 263-70.

1. The Potential for Good Ideas

Knowledge significantly outweighs the traditional inputs to the production process of land, labor, and capital.³⁵⁸ In turn, as North observes, “[t]he growth in the stock of human knowledge is the fundamental underlying determinant of the upper bound of human well-being.”³⁵⁹ Ideas are understood to be a classic public good; we all benefit from useful inventions.³⁶⁰ As intellectual or mental goods, ideas also are often essential inputs into other activities.³⁶¹ An adaptive society must find and maintain the means to explore new ideas.³⁶² Mechanisms generating new ideas, which in human society are expressed culturally, “are as important as access to abundant resources for economic growth and economic adaptation.”³⁶³ Ideas also are the currency of cyberspace.³⁶⁴ As a result, as pointed out in an earlier Article, we should want “More Good Ideas” to serve as a proxy for maximizing society’s capacity for productive change, and hence economic growth and well-being.³⁶⁵

There can be differing views on what constitutes a good idea, or how many such ideas are adequate. From the public policy perspective, the notion of “More” is the quantity function, which involves generating an optimal number of inputs available to and from agents in the larger social system. The notion of “Good” is the quality function, which involves the evolutionary function of social agents identifying, selecting, and amplifying the ideas they desire. The policy premise I am suggesting here is that the quantity function of ideas in the market (or larger society) may be lacking, so that some public role is required.³⁶⁶ This is because information as a public good is likely to be undervalued by both the market

358. ATKINSON, *supra* note 49, at 266.

359. NORTH, *supra* note 151, at 78.

360. Kahan, *supra* note 312, at 363.

361. Brett M. Frischmann, *Speech, Spillovers, and the First Amendment*, 2008 U. CHI. LEGAL F. 301, 310-12 (2008). In most conversations, we are aiming at understanding, not just knowledge, and the path of ideas tells a story of constant conversation, elaboration, and disagreement. DAVID WEINBERGER, *EVERYTHING IS MISCELLANEOUS: THE POWER OF THE NEW DIGITAL DISORDER* 202-03 (2007).

362. GEERAT J. VERMEIJ, *NATURE: AN ECONOMIC HISTORY* 308 (2004).

363. *Id.* at 310.

364. ZITTRAIN, *supra* note 99, at 161.

365. Whitt & Schultze, *supra* note 1, at 297-99.

366. KINGDON, *supra* note 124, at 116-17 (discussing the policy primeval soup as a place where ideas float around in policy communities). The goal of “More Good Ideas” can be extended to the political market as well; maximizing the quantity of policy ideas maximizes the ability to get quality policy solutions discussed, accepted, and implemented. *See* STONE, *supra* note 55, at 34 (“Ideas are the very stuff of politics. People fight about ideas, fight for them, and fight against them. . . . Moreover, people fight *with* ideas as well as about them.”).

and the political system.³⁶⁷ Put in rough terms, the More is where tailored public policy may need to enter the picture, while the Good is where the market (properly buttressed by enabling institutions and organizations) should be in command.³⁶⁸ As we shall see, this dichotomy can lead to government “tinkering” to provide additional inputs, connectivity, incentives, and transparency to the market. These enabling elements can help improve opportunities for More Good Ideas to be created, heard, and adopted.

2. Clashes in the “Watering Hole of Perceptions”

One reasonably may challenge the notion that we should leave the quality function of More Good Ideas solely or primarily to the market, or even to society at large. For example, some behavioral economists question the ordinary person’s ability to sort through different ideas to reach the right decisions, and then to learn from mistakes made. These economists seek a more active role for policymakers to help individuals frame decisions correctly;³⁶⁹ in essence, to determine just what constitutes a good idea. In the view of Dan Ariely and others, we need more than just raw information: we need tools to help us make better decisions.

Ariely observes that we are far less rational than traditional economics supposes, and that “market forces” alone are powerless to help us learn from our many cognitive mistakes.³⁷⁰ However, because our “decision illusions” are both systematic and predictable, Ariely believes that policymakers can develop strategies, tools, and methods to help us make better decisions.³⁷¹ Others agree that “introspection cannot overcome the biology that shapes our thoughts.”³⁷² In essence, our mental limitations prevent us from accepting our mental limitations.³⁷³ If true, a “feedback mechanism” function should include a role for the policymaker to “guide”

367. See Frischmann, *supra* note 361, at 305. Frischmann observes that speech, which includes all forms of communications as both activity and thing, regularly generates externalities. *Id.* at 310. These uncaptured spillovers lead to a persistent risk of underparticipation in the speech process, and underproduction of the speech itself. *Id.* at 315, 320.

368. *Id.* at 317 (endorsing the notion that, “[i]n a decentralized manner that is different from but perhaps analogous to the market, these choices ‘filter’ beneficial from harmful ideas”).

369. DAN ARIELY, PREDICTABLY IRRATIONAL: THE HIDDEN FORCES THAT SHAPE OUR DECISIONS 239-44 (2008).

370. *Id.* at 239.

371. *Id.* at 240-41.

372. ROBERT A. BURTON, M.D., ON BEING CERTAIN: BELIEVING YOU ARE RIGHT EVEN WHEN YOU’RE NOT 159 (2008).

373. *Id.* at 159.

the way to better thinking processes, without necessarily instilling better thoughts.³⁷⁴

It may be instructive here to touch on this “quality function” question in the context of the psychological presumptions behind our courts’ treatment of the First Amendment to the U.S. Constitution. First Amendment doctrine presumes a decidedly “white box” model, where citizens face a “marketplace of ideas” of full transparency and total information. The doctrine has its roots in the famous dissenting opinion of Justice Oliver Wendell Holmes in *Abrams v. United States*,³⁷⁵ where he posited that “the ultimate good desired is better reached by free trade in ideas.”³⁷⁶ Interestingly, Justice Holmes never employs the phrase “marketplace of ideas” in his dissent, and he treats the concept provisionally, as a “theory” based on an “experiment.”³⁷⁷ Later employment of the metaphor of the “‘marketplace of ideas’ embodies two key assumptions—(a) that ideas compete, and (b) that they compete on the basis of their truthfulness.”³⁷⁸ The presumption is that “good ideas flourish and bad ideas fail.”³⁷⁹

374. These concepts are particularly well established in the context of the political process. See, e.g., BRYAN CAPLAN, *THE MYTH OF THE RATIONAL VOTER: WHY DEMOCRACIES CHOOSE BAD POLICIES* (2007); RICK SHENKMAN, *JUST HOW STUPID ARE WE?: FACING THE TRUTH ABOUT THE AMERICAN VOTER* (2008); DREW WESTEN, *THE POLITICAL BRAIN: THE ROLE OF EMOTION IN DECIDING THE FATE OF THE NATION* (2007). Some claim that we should trust markets because we should be pessimistic about the irrationality of voters in a democracy; despite its defects, we should embrace the free market because it still outshines the democratic alternatives. CAPLAN, *supra*, at 350. However, this should not be seen as an “either/or” scenario, but rather a division of labor between markets and government based on their relative strengths.

375. *Abrams v. United States*, 250 U.S. 616 (1919).

376. *Id.* at 630 (Holmes, J., dissenting). One can go back further to John Milton’s famous defense of the freedom of the press with his rhetorical query, “who ever knew Truth put to the worse, in a free and open encounter?” JOHN MILTON, *AREOPAGITICA* (1644), available at http://www.columbia.edu/itc/journalism/j6075/edit/readings/areopagitica_milton.html.

377. *Abrams*, 250 U.S. at 630 (Holmes, J., dissenting). Holmes stated in full that:

[T]he best test of truth is the power of the thought to get itself accepted in the competition of the market, and that truth is the only ground upon which their wishes safely can be carried out. That at any rate is the theory of our Constitution. It is an experiment, as all life is an experiment.

Id.

378. Chip Heath, Chris Bell & Emily Sternberg, *Emotional Selection in Memes: The Case of Urban Legends*, 81 J. PERSONALITY & SOC. PSYCH. 1028 (2001).

379. Blocher, *supra* note 152, at 824. As another author notes, “people who stand near the holes in a social structure are at higher risk of having good ideas.” Ronald S. Burt, *Structural Holes and Good Ideas*, 110 AM. J. SOCIOLOGY 349, 349 (2008), available at <http://www.journals.uchicago.edu/doi/abs/10.1086/421787>. Burt’s research shows that opinions and behaviors are more homogenous within than between groups, so individuals connected across different groups are more familiar with alternative ways of thought and behavior, which gives them more options to select and synthesize from alternatives. See generally *id.* “New ideas emerge from selection and synthesis across the structural holes

In reality, however, the “ideas market” does not often work that way. Initially, some question whether our view of the right of free expression should turn on a commerce-based metaphor.³⁸⁰ More critically, it is not obvious that the market always allows a sufficiently robust level of competition between ideas. It is a false assumption, for instance, that everyone has access to the market. The metaphor depends on a neoclassical concept of atomistic individuals engaged in a perfectly costless and efficient exchange of ideas;³⁸¹ this overlooks the difficulties in creating a truly robust marketplace. There are considerable transaction costs, in terms of the time and expense necessary to find, evaluate, and obtain (let alone produce) good ideas or products.³⁸² Institutions can help or hinder an individual’s attempts to overcome these transaction costs.

It is certainly not clear that the truthfulness of an idea is a proper, or even achievable, criterion.³⁸³ Among the unstated assumptions are that truth is objective and discoverable, truth is always among the ideas in the marketplace and always survives, and people can perceive (or even want) the truth.³⁸⁴ To the last point, as we have seen, at best, users also operate under bounded rationality and have a variety of cognitive constraints and shortcomings. Ideas propagate using a variation-selection-retention approach, and “emotional selection” is an additional means of competition based on the ability of a meme to tap common emotions.³⁸⁵ Philip Tetlock’s extensive research demonstrates that the user side of the “marketplace of ideas” equation has at least three major imperfections “that permit lots of nonsense to persist for long stretches of time,”³⁸⁶ namely, that consumers can be unmotivated to be discriminating judges of claims and counterclaims, can have the “wrong motives” of buttressing prejudices rather than pursuing truth, and can suffer from cognitive constraints or task difficulty constraints.³⁸⁷

between groups. Some fraction of those new ideas are good.” *Id.* at 350. Theoretically at least, the Internet offers one way to fulfill this role of bridging different groups.

380. CASS SUNSTEIN, *DEMOCRACY AND THE PROBLEM OF FREE SPEECH* 17-18 (Free Press 1993) (1970).

381. Blocher, *supra* note 152, at 825.

382. *Id.* at 825-26, 831.

383. Frischmann, *supra* note 361, at 303 n.6. (As Frischmann explains, because “Truth” varies, “arguably, it is the *variance in Truths* (or perspectives on truth) that the metaphorical Marketplace supports.”).

384. W. Wat Hopkins, *The Supreme Court Defines the Marketplace of Ideas*, 73 *JOURNALISM & MASS COMM. Q.* 40, 44-46 (Spring 1996).

385. Heath, Bell & Sternberg, *supra* note 378, at 1029-30.

386. TETLOCK, *supra* note 74, at 231.

387. *Id.* at 231-32. There is also disturbing evidence that false beliefs can influence people’s attitudes even after they are understood to be false. John G. Bullock, *The Enduring Importance of False Political Beliefs* (Mar. 14, 2006) (unpublished manuscript, available at http://www.allacademic.com/meta/p_mla_apa_research_citation/0/9/7/4/5/p97459_

Recent analytical and empirical work suggests that the marketplace of ideas may be closer to what I would term a “watering hole of perceptions,” where participants with unequal access mix and match truth and error in unpredictable ways. One small example is the persistent meme that then-Vice President (and former presidential candidate) Al Gore claims to have “invented the Internet.” Mr. Gore’s statement in a 1999 interview about his service in the U.S. Congress included the comment that he “took the initiative in creating the Internet.”³⁸⁸ Given Gore’s extensive legislative work on the “information superhighway,” including funding the predecessor academic networks and commercializing the Internet backbone, that statement appeared noncontroversial, at least to the interviewer. Yet through repeated misstatements fed by his political opponents and a complicit press, the notion that Gore claims to have “invented the Internet” took strong hold in the court of public opinion. One recent research paper analyzing this “political equivalent of an urban legend”³⁸⁹ concludes that “truth does not always win out in the marketplace of ideas, even when the marketplace is highly competitive,”³⁹⁰ as would be expected in a high-stakes, widely-covered political campaign.³⁹¹

These apparent flaws in the marketplace-of-ideas metaphor strongly suggest the desirability for some tailored policy involvement in the market to yield More Good Ideas. We should be quite cautious, however, not to take things too far. Freedom of expression does not necessarily mean truthful expression. Different marketplaces of ideas exist, including those for commercial, political, and personal speech. People have numerous reasons to communicate (or, by extension, engage in transactions) with each other, such as exchanging opinions, arguments, and entertainment.

index.html) (presented at the annual meeting of the Western Political Science Association in Albuquerque, N.M., Mar. 17, 2006). Even when accepted, facts alone may not be enough to dislodge false beliefs, with the most confident citizens often being those who hold the most inaccurate beliefs. *See id.* at 33-35. In some cases, such as the false notion that the Iraqi government possessed weapons of mass destruction in 2002, corrections actually increase misperceptions. *See* Brendan Nyhan & Jason Reifler, *When Corrections Fail: The Persistence of Political Misperceptions* 1, 11-16 (Feb. 2, 2008) (unpublished manuscript, available at <http://www.duke.edu/~bjn3/nyhan-reifler.pdf>).

388. *Late Edition: Interview of Vice President Al Gore by Wolf Blitzer* (CNN television broadcast Mar. 11, 1999) (transcript available at <http://www.cnn.com/ALLPOLITICS/stories/1999/03/09/president.2000/transcript.gore/>).

389. Chip Heath & Jonathan Bendor, *When Truth Doesn’t Win the Marketplace of Ideas: Entrapping Schemas, Gore, and the Internet* 14 (Mar. 10, 2003) (unpublished manuscript, on file with author).

390. *Id.* at 4. Among other points, the Article reveals that about twice as many news articles attributed the false phrase to Gore as attributed the true one. *Id.* at 13. Further, the incorrect attribution triggered a perception that Gore was a liar, which “snowballed over time by adding additional false ideas that reinforced this entrapping schema.” *Id.* at 14.

391. *See also* Piety, *supra* note 265, at 209-10 (it is “demonstrably false” that the market eventually corrects for falsehood).

The notion is not necessarily that truth will always win out, but that people are free to express and receive what they see as most important to them. Once the government begins judging what constitutes a good idea and what does not, the First Amendment is in grave jeopardy.³⁹²

Further, the availability of a ubiquitous communications/information platform in the Internet should help us achieve a more equitable and competitive—if not always truthful—level. The Internet can enable users to promulgate a vast array of ideas, and at times, even sift out the bad ones. Of course, for the Internet to carry out this function of promulgating, sifting, and disseminating, all in the service of More Good Ideas, we may need some public policy objectives to support that goal.

B. An Objective: Harnessing Communications Networks as Online Platforms

So, in understanding the challenge of fostering a more robust marketplace for ideas—and by extension PTs, STs, and BPs—we should ask: what are the intermediate policy steps that will bring us More Good Ideas? The suggested approach is to define our policy objectives in a more granular way, while still retaining the holistic view of how the different components interrelate.

In *Emergence Economics*, we explained the importance of human communications to the very fabric of our civilization.³⁹³ Communications is all about broadly accessible connectivity, and the telecommunications sector “provides increasingly ubiquitous infrastructure for the New Ecosystem” of the market.³⁹⁴ “Innovation in communications and the organization of information fosters educational, political, and social development,”³⁹⁵ and reduces the transaction costs for conveying and exchanging ideas.

A deep understanding of the telecommunications market should lead policymakers to see that its underlying infrastructure is a “general purpose

392. TETLOCK, *supra* note 74, at 233-34. Along those lines, Tetlock suggests that rather than utilizing government filtering mechanisms, we need self-correcting epistemic communities, such as academic journals. *Id.* Blocher similarly suggests that courts should defer to the speech roles of institutions that enhance the marketplace of ideas, such as schools and universities, for the same reasons that economists tend to defer to the private norms of market-enhancing institutions. Blocher, *supra* note 152, at 877, 882-83, 889.

393. Whitt & Schultze, *supra* note 1, at 290-91.

394. FRANSMAN, *supra* note 58, at 14; *see also* SPAR, *supra* note 44, at 9 (“[C]ommunications technologies have a certain force to them, and a particular import. For communication is the sinew of both commerce and politics, the channel through which information—and thus power—flows.”).

395. Benjamin & Rai, *supra* note 40, at 108.

technology” that “drives innovation and productivity.”³⁹⁶ In particular, the Internet has become the cornerstone of communications policy, given the enormous economic and social benefits that it provides.³⁹⁷ “As the digital economy has emerged, telecommunications policy has become not just more complex, but more important.”³⁹⁸

In *Emergence Economics*, we tentatively suggested three interrelated objectives related to the optimal deployment and use of broadband networks that enable robust access to the Internet: (1) open platforms, (2) more platforms, and (3) bigger platforms.³⁹⁹ Others have articulated a similar view,⁴⁰⁰ and I will explore another version of this concept in greater depth in an upcoming paper on U.S. broadband policy.⁴⁰¹ For now, it is worth noting that we need the right institutions and organizations in place—from laws to norms, Congress to SROs—to create the right incentives for optimal Internet broadband deployment and use.

One implication is that governments should seek to eliminate harmful barriers to the use and development of the Internet, including unnecessary obstacles to Internet transmissions. Frischmann and van Schewick explain:

[T]he rate with which the Internet can contribute to economic growth is . . . limited by the rate of application-level innovation. Measures that reduce application-level innovation have the potential to significantly limit economic growth. Measures that increase application-level innovation have the potential to significantly increase economic growth.⁴⁰²

Relatedly, former Nobel Laureate Edward Prescott advocates for open borders for trade because he believes “[i]t is openness that gives people the opportunity to use their entrepreneurial talents to create social surplus, rather than using those talents to protect what they already have. Social

396. See ATKINSON & AUDRETSCH, *supra* note 4, at 26. Importantly, all general purpose technology—including communications networks—create significant spillover effects. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 98-100. This means that the platform owners inherently do not capture the full economic benefits that flow from use of their platforms.

397. See Brett M. Frischmann, *An Economic Theory of Infrastructure and Commons Management*, 89 MINN. L. REV. 917, 1016-17 (2005).

398. ATKINSON & AUDRETSCH, *supra* note 4, at 25.

399. Whitt & Schultze, *supra* note 1, at 299-303.

400. See ATKINSON & AUDRETSCH, *supra* note 4, at 26 (arguing explicit national policies should spur the development of better broadband networks, including giving incentives to private providers to invest in such networks, and in providing broadband to more areas and more people).

401. Richard S. Whitt, *Evolving Broadband Policy: Taking Adaptive Stances to Foster Optimal Internet Platforms*, 17 COMMLAW CONSPECTUS 417 (2009) (final version on file with author).

402. Brett M. Frischmann & Barbara van Schewick, *Network Neutrality and the Economics of an Information Superhighway: A Reply to Professor Yoo*, 47 JURIMETRICS J. 383, 424 (2007) (internal citations omitted).

surplus begets growth, which begets social surplus, and so on.”⁴⁰³ Others have pointed out that “where information and knowledge cross frontiers, armies will not.”⁴⁰⁴ Regardless, the key point is that using public policy to help harness the power and potential of communications networks can enable More Good Ideas.

C. Focus on the FCC: The Organizational and Institutional Challenges

1. The Traditional Role

Scholars have argued that “[l]ike the economy as a whole, the telecommunications sector constitutes a complex evolving system”⁴⁰⁵ and that “telecommunications policy is embedded in multiple layers of social arrangements, such as constitutional provisions, statutory provisions, and specific regulatory institutions.”⁴⁰⁶ First, the powers-that-be must decide that government regulation is warranted, and then determine a choice among different organizations and institutions.⁴⁰⁷ Public policymaking includes setting the agenda, specifying alternative policy choices, selecting a policy, and implementing the decision; a successful policy outcome depends on success in all these processes.⁴⁰⁸

The FCC is an independent regulatory agency, charged by Congress with the task “to make available, so far as possible, to all the people of the United States . . . a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges.”⁴⁰⁹ The Communications Act of 1934, as amended, is the FCC’s governing statute, incorporating, most recently, the Telecommunications Act of 1996.⁴¹⁰ In addition, the Administrative Procedures Act (APA)⁴¹¹

403. MICHAEL SHERMER, *THE MIND OF THE MARKET: COMPASSIONATE APES, COMPETITIVE HUMANS, AND OTHER TALES FROM EVOLUTIONARY ECONOMICS* 38 (2008) (quoting Edward C. Prescott, Opinion, *Competitive Cooperation*, WALL ST. J., Feb. 15, 2007, at A19).

404. *Id.* at 258 (emphasis omitted). Shermer calls this the “Google theory of peace.” *Id.* One way of accomplishing this objective is to actively seek to eliminate trade barriers in the online world. U.S. trade policy in particular can be used to minimize regulation of Internet transmissions that impedes international trade, investment, and innovation. This includes ensuring that any regulation of Internet transmissions is done in a nondiscriminatory fashion, and carried out in a transparent and open manner.

405. Cherry & Bauer, *supra* note 53, at 19.

406. Bauer & Wildman, *supra* note 63, at 419.

407. Benjamin & Rai, *supra* note 40, at 132.

408. Barbara A. Cherry, *Analyzing the Network Neutrality Debate Through Awareness of Agenda Denial*, 1 INT’L J. COMM. 580, 581 (2007).

409. 47 U.S.C. § 151 (2000).

410. Pub. L. No. 104-104, 110 Stat. 56, 143 (1996) (codified as amended in scattered sections of 47 U.S.C. (2000)). The 1934 Act arguably has had more staying power than the

generally establishes the appropriate processes that the FCC can employ in its various proceedings.

The FCC typically adopts, implements, and enforces rules and regulations, pursuant to specific procedural requirements adopted over the years pursuant to the 1934 Act. The FCC's substantive rulemaking authority is comprised of hundreds of engineers, economists, and lawyers who help and inform the rulemaking process and, ultimately, the decisions that its five commissioners make.⁴¹² Rather than a single monolith, then, the agency is the sum of its many moving parts, working together (or in opposition) to varying degrees of effectiveness.

The APA requires that federal agencies, such as the FCC, undertake rulemaking proceedings based on a notice-and-comment process.⁴¹³ Section 553 stipulates that the FCC must publish notices in the *Federal Register*, and then give interested parties an opportunity to participate in the rulemaking "through submission of written data, views, or arguments."⁴¹⁴ The APA takes a fairly broad view of a rule, defined as "an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy."⁴¹⁵ The FCC's enforcement authority also derives from the 1934 Act.

2. The Evolving Challenges

Of course, a mere recitation of the basics of classroom administrative law, as applied to the FCC, sheds little light on the FCC's actual operation. We need further perspective on the challenges that the FCC faces, particularly given its role as an arbiter between various enormous and powerful political factions in a rapidly evolving marketplace. The objective here is not to criticize the FCC for what it is, but instead to offer constructive suggestions on ways for it to become more adaptive, flexible, and tailored in its inevitable market role.

1996 Act, perhaps because it is written in a more general way with more leeway given to the FCC for interpretation. The 1996 Act also rested on an unsustainable policy model, and was the victim of major technological and economic transformations within the industry. See Bauer & Wildman, *supra* note 63, at 422-23.

411. 60 Stat. 237 (1946) (codified as amended at 5 U.S.C. § 551-559 (2000)).

412. Benjamin & Rai, *supra* note 40, at 147; see also FCC, About the FCC, <http://www.fcc.gov/aboutus.html> (last visited Apr. 18, 2009).

413. 5 U.S.C. § 553.

414. § 553(c). There is a longstanding debate among commentators about the benefits and costs of the public comment process. For a thorough review, see Benjamin & Rai, *supra* note 40, at 168-74, concluding that an APA-style comment process "is not essential, or even particularly helpful, for purposes of improving innovation regulation."

415. § 551(4). Notably, while § 553 applies to legislative rules, it does not apply to two other categories of agency actions: statements of policy (which are guidelines with no force of law), and interpretive rules (with force of law).

The FCC faces two major challenges: accessibility as an organization and flexibility in its institutions. We have already discussed the concept of regulatory capture under public choice theory. Former FCC Chairman William Kennard puts it succinctly: “[r]egulatory capitalism is when companies invest in lawyers, lobbyists and politicians, instead of plant, people and customer service.”⁴¹⁶ The logic of collective action assumes that a group of small powerful firms with concentrated interests will have an easier time influencing decisionmakers than large, diffuse groups.⁴¹⁷ Even where it is assumed that policymakers like the FCC pursue “public-regarding objectives,” the concept of “informational capture” means that those same narrow interests have the resources to be the most vigorous suppliers of relevant information.⁴¹⁸ In a similar vein, where policymakers rely on concepts from Old School Economics, one could say they are subject as well to what I consider to be a form of “theory capture.”

Cherry and Bauer argue that sources of the unsustainability of telecommunications policy include “initial improper general design,” “changes internal or external to the policymaking system,” and “a failure to adapt.”⁴¹⁹ By contrast, sustainable telecommunications policies are politically adoptable and the desired goals of such policies are reasonably likely to be achievable. They also point out that there should be more of a focus on process rather than outcomes.⁴²⁰ Communications policymakers should “shift from a traditional paradigm emphasizing static optimization to an evolutionary paradigm focused on adaptability . . . [using] a mental model of the coevolution of policy” and the telecommunications market.⁴²¹ In addition, policymakers should not overmanage to achieve specific outcomes, but rather should “seek to enable emerging properties of the [] sector”⁴²²—what I refer to as “tinkering without tampering.” Further, policymakers should understand that their goals and the means of achieving them will evolve. They will accept that it is necessary to experiment—and inevitably fail—in an environment of uncertainty, and will then utilize new research tools.⁴²³

Nonetheless, there is no clear evidence that the primary decisionmakers at the FCC fully understand and appreciate these concepts.

416. William E. Kennard, Chairman, FCC, *Internet Telephony: America Is Waiting*, Remarks Before Voice over the Net Conference (Sept. 12, 2000) (transcript available at <http://www.fcc.gov/Speeches/Kennard/2000/spwek019.html>).

417. Benjamin & Rai, *supra* note 40, at 135.

418. *Id.* at 136.

419. Cherry & Bauer, *supra* note 53, at 23-25.

420. *Id.* at 3.

421. *Id.* at 26.

422. *Id.* at 27.

423. *Id.* at 27.

In fact, the FCC has had an historic tendency to align itself with the interests of the incumbents that it regulates, which in turn has a dampening effect on technological innovation. As Stuart Benjamin and Arti Rai put it, “the two most noticeable themes in FCC history have been its catering to powerful interests and, quite relatedly, its thwarting of the deployment of new technologies.”⁴²⁴ The FCC’s responsiveness to incumbents has entailed hostility toward disruptive innovations and innovators.

Perhaps the single best historic example is TV broadcasters. The stories have been told often and well,⁴²⁵ but a quick outline is worth repeating. The classic case of regulatory capture arises when the major incumbents from a regulated industry band together and exert significant influence over the administrative agency. Since the TV broadcasters first received their spectrum many decades ago, their lobbyists have succeeded in using various regulatory restrictions to delay and hamper the progress of cable TV, cellular telephony, satellite TV, low-power TV, and even TiVo.⁴²⁶ A more recent example is the broadcasters’ staunch political opposition to an FCC proposal to allow unlicensed use of the white spaces located between licensed digital TV channels.⁴²⁷ The broadcasters also pressed the FCC to adopt the so-called “broadcast flag” to protect TV producers’ copyrights.⁴²⁸ In all these instances, the issue is not whether these companies have the right to petition the government to protect their business interests—under our current system of government, they plainly do—but rather, what reception they receive from policymakers. All too often that reception has been a welcoming one.

As discussed in some depth in *Emergence Economics*, the FCC’s *Wireline Broadband Order* is a recent notable example of poor adaptive policy.⁴²⁹ In that decision, the FCC redefined wireline broadband service provided by incumbent local exchange carriers (ILECs) as an unitary information service, and removed the obligation that the ILECs allow nondiscriminatory access to unaffiliated Internet service providers

424. Benjamin & Rai, *supra* note 40, at 147.

425. See, e.g., Thomas Hazlett, *The Wireless Craze, the Unlimited Bandwidth Myth, the Spectrum Auction Faux Pas, and the Punchline to Ronald Coase’s “Big Joke”*: An Essay on Airwave Allocation Policy, 14 HARV. J.L. & TECH. 335, 405-51 (2001).

426. Benjamin Lennett, *The Lobby That Cried Wolf: NAB Campaign Against Using TV White Space Follows a Familiar Script*, ISSUE BRIEF (New Am. Found. Wireless Future Program, Washington, D.C.), Oct. 2008, at 1-9; see also Benjamin & Rai, *supra* note 40, at 147-51.

427. Lennett, *supra* note 426, at 10-11. This example also demonstrates how the FCC can be exceedingly slow to open spectrum resources to more productive uses. See generally Hazlett, *supra* note 425.

428. Benjamin & Rai, *supra* note 40, at 123.

429. Whitt and Schultze, *supra* note 1, at 293-96.

(ISPs).⁴³⁰ That decision betrayed some notably nonadaptive thinking in terms of the ends and the means. The betrayal included (1) a failure to grasp the “big picture”—by slighting concerns about ISPs retaining access to the Internet, (2) an inflexible and irreversible approach—by relying on a statutory interpretation over more flexible alternatives, (3) lack of a nuanced approach—regulation/deregulation is all or nothing, and (4) a profound lack of accountability—by not including a future mechanism to reassess the market response. Perhaps most damningly, the FCC did not ask itself a simple question (either in its decision here, or elsewhere): “whether, on balance, the proposed regulatory action maximized the sum of innovation incentives for all innovators, both current and future.”⁴³¹

Often the FCC cannot seem to help but regulate new technologies as if they fit old legal paradigms. In the decision granting the AOL/Time Warner merger, for example, the FCC imposed a mandatory condition that AOL must allow other Internet portals to interconnect with its AIM service.⁴³² In addition to likely exceeding its legal authority over Internet-based software applications, that decision failed to foresee that the rapidly-moving Web market eventually would render the condition unnecessary.⁴³³ Similarly, in its recent decisions concerning Voice-over-Internet Protocol (VoIP) technology, the FCC has steadily imposed a series of social and economic obligations on VoIP service, under its “ancillary” Title I authority.⁴³⁴ These decisions show seemingly little regard for the unique nature of VoIP technology, as well as the variety of less dictating institutional implements, such as performance standards,⁴³⁵ available to prod the market in the right policy direction. Instead, the FCC’s various

430. Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities, *Report and Order and Notice of Proposed Rulemaking*, 20 F.C.C.R. 14853 (2005) [hereinafter *Wireline Broadband Order*].

431. Benjamin & Rai, *supra* note 40, at 166.

432. Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations by Time Warner Inc. and America Online, Inc., *Memorandum Opinion and Order*, 16 F.C.C.R. 6547 (2001).

433. Within 30 months the FCC reversed course and removed the condition. Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations by Time Warner Inc. and America Online, Inc., Transferors, to AOL Time Warner Inc., Transferee, *Memorandum Opinion and Order*, 18 F.C.C.R. 16835 (2003).

434. See e.g., Rob Frieden, *What Do Pizza Delivery and Information Services Have In Common? Lessons from Recent Judicial and Regulatory Struggles with Convergence*, 32 RUTGERS COMPUTER & TECH. L.J. 247, 280-88 (2007).

435. See, e.g., Coglianese & Kagan, *supra* note 188, at xxiv (“By specifying an end state to achieve, performance standards give regulated firms the ability to choose both the most effective and least costly means of reducing harm. Performance standards also provide firms with an opportunity to innovate, seeking out better or lower-cost strategies to meet the performance target.”).

VoIP-related dockets have slowly subjected the technology to death by a thousand cuts.⁴³⁶

FCC procedures also can be utilized to support political outcomes. Paul Kouroupas has identified several additional examples of what he calls “process as a weapon,” including the FCC’s ISP reciprocal compensation regime, where the FCC bailed out the ILECs from cost impacts from poorly-conceived interconnection contracts with competitive local exchange carriers (CLECs).⁴³⁷ The FCC’s line-sharing decision serves as yet another salutary example, one of the triumphs of politics over substance. The concept of unbundling network elements (UNEs) of the local phone companies’ last-mile networks was seen through a “new conceptual lens,” namely that unbundling has overall negative effects on new facilities deployment by reducing carriers’ incentives to invest.⁴³⁸ While four of the five FCC Commissioners actually supported allowing data CLECs to continue utilizing the data portion of DSL-equipped local loops, they accepted the trade-off of terminating the UNE platform—essentially favoring more immediate incumbent investment over more facilities-based competition. The result consigned facilities-based data CLECs to a world without guaranteed access to the data portion of copper loops.⁴³⁹

There is also ample evidence that the FCC’s processes themselves are flawed, so that “its current lack of data-driven decision-making and its emphasis on political dealing hinders the thoughtfulness of its analysis, limits its ability to address issues effectively, and invites a cynical attitude toward government.”⁴⁴⁰ Those salient issues are beyond the scope of this Article. The larger point here is that the FCC’s decisions often do not

436. See IP-Enabled Services, *Report and Order*, 22 F.C.C.R. 11275 (2007); Implementation of the Telecomm. Act of 1996: Telecomm. Carriers’ Use of Customer Proprietary Network Info. and Other Customer Info., *Report and Order and Further Notice of Proposed Rulemaking*, 22 F.C.C.R. 6927 (2007); Universal Serv. Contribution Methodology, *Report and Order and Notice of Proposed Rulemaking*, 21 F.C.C.R. 7518 (2006), *aff’d in relevant part*, Vonage Holdings Corp. v. FCC, 489 F.3d 1232 (D.C. Cir. 2007); Comm. Assistance for Law Enforcement Act & Broadband Access & Serv., *First Report and Order and Further Notice of Proposed Rulemaking*, 20 F.C.C.R. 14989 (2005), *aff’d*, Am. Council on Educ. v. FCC, 451 F.3d 226 (D.C. Cir. 2006); IP-Enabled Services, *First Report and Order and Notice of Proposed Rulemaking*, 20 F.C.C.R. 10245 (2005), *aff’d*, Nuvio Corp. v. FCC, 473 F.3d 302 (D.C. Cir. 2006).

437. Kouroupas, *supra* note 70, at 7-10.

438. Bauer & Wildman, *supra* note 63, at 425-26.

439. Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, *Report and Order and Order on Remand and Further Notice of Proposed Rulemaking*, 18 F.C.C.R. 16978 (2003), *vacated in part* U.S. Telecom Ass’n v. FCC, 359 F.3d 554 (D.C. Cir. 2004).

440. Philip J. Weiser, *Institutional Design, FCC Reform, and the Hidden Side of the Administrative State* 5 (Colorado Law Legal Studies Working Paper No. 09-01, 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1336820.

match up well with the dynamic ecosystem with which it is coevolving. Its greatest challenge may be to remedy its current lack of a principled and well-thought-out framework for identifying and addressing ways to effectively discipline market behavior, where necessary, with a quick and tailored touch. As suggested above, a good starting point would be to begin investing in policies that are more cautious, macroscopic, incremental, experimental, contextual, flexible, provisional, accountable, and sustainable.

Finally, although this Article will not address various proposals for wholesale legal changes to the FCC's governing structure,⁴⁴¹ or calls for the FCC to hand some of its authority to other agencies, such as the Federal Trade Commission (FTC),⁴⁴² some suggested intra-agency organizational changes are worth noting. For example, Phil Weiser recommends that the FCC re-adopt a Chief Technology Officer (CTO) and re-empower a Chief Economist to improve the technical and economic advice being given to the Commissioners.⁴⁴³ Others suggest that the FCC should adopt an internal separation-of-powers approach.⁴⁴⁴

Two other structural fixes could add useful voices from within the FCC. As has been noted, government actors tend to systematically ignore or misunderstand innovation absent measures designed to foster more careful thinking.⁴⁴⁵ Including a new Office of Innovation Advocate can ensure that the FCC's regulatory process includes explicit attention to the effects of any decision on the course of technological innovation. In a similar vein, an Office of Ombudsman (perhaps best thought of as an "Office of Devil's Advocate") would be charged with challenging fundamental empirical and analytical assumptions underlying draft decisions, and/or proposed institutional approaches. This would, among other things, make the process more transparent for the public, and add another organizational view to counter the natural organizational bias

441. See, e.g., *id.* at 12-32 (the FCC should significantly overhaul its institutional tools and processes, or else consider outright abolition).

442. See, e.g., Jonathan E. Nuechterlein, *Antitrust Oversight of an Antitrust Dispute: An Institutional Perspective on the Net Neutrality Debate* (Reg-Market Center, AEI Center for Regulatory & Market Studies, Working Paper No. 08-07, 2008), available at <http://aei-brookings.org/admin/authorpdfs/redirect-safely.php?fname=../pdffiles/phpGw.pdf> (arguing that FTC should assume jurisdiction over network neutrality issues).

443. Weiser, *supra* note 440, at 26; see also Adam Bender & Jonathan Makes, *Pittsburgh Panelists Debate U.S. Broadband Ranking*, COMM. DAILY, July 23, 2008, available at 2008 WLNR 13920654 (Westlaw) (Former FCC Chief Technologist Dave Farber believes the FCC should revive the CTO position to avoid the temptation of adopting controls that will stunt technological growth).

444. See, e.g., HAROLD W. FURCHTOTT-ROTH, A TOUGH ACT TO FOLLOW?: THE TELECOMMUNICATIONS ACT OF 1996 AND THE SEPARATION OF POWERS (2006).

445. Benjamin & Rai, *supra* note 40, at 112.

toward incumbent players, and traditional regulation/no regulation approaches.

D. Additional Implements of an Adaptive Toolkit for Communications Policy

1. The Conceptual Metaphors

As pointed out above, the basic concept of metaphors is that we project more bodily-based perceptual patterns to understand more abstract domains.⁴⁴⁶ Even the airiest of our ideas are expressed in “thumpingly concrete metaphors.”⁴⁴⁷ Humans are embodied beings with embodied minds, constituted and constrained by the body and brain. We cannot help but conceive of the world in physical terms, such as “Love Is a Journey.”⁴⁴⁸ In so doing, we integrate our metaphors in conceptual “blends,” or networks of mental spaces.⁴⁴⁹

Metaphors and analogies are both limiting and limited “transitional objects.”⁴⁵⁰ They can illuminate, but also blind. The “free market” and the “state of nature,” are examples of metaphors that can mislead, rather than inform.⁴⁵¹ And we have already seen how the well-employed concept of the traditional “marketplace of ideas” can be challenged on many fronts.

“Law is supposed to be a process in which specific issues are correctly placed within the established legal framework.”⁴⁵² Issue framing is common in the law, where adversaries contend as to which is the correct frame to fit a certain situation.⁴⁵³ The use of metaphor in legal discourse has been especially ubiquitous, with enormous power over the thought and behavior of policymakers and market agents alike.⁴⁵⁴ “We speak of analytic

446. See, e.g., LAKOFF & JOHNSON, *supra* note 325, at 45 (“Metaphor allows conventional mental imagery from sensorimotor domains to be used for domains of subjective experience.”).

447. STEVEN PINKER, *THE STUFF OF THOUGHT: LANGUAGE AS A WINDOW INTO HUMAN NATURE* 237 (2007). Pinker disputes the notion, promoted by George Lakoff and Mark Johnson, that the human mind can directly think only about concrete experiences, and metaphorical allusions to those experiences—what he calls “the metaphor metaphor.” *Id.* at 238. Even if one agrees with Pinker—and his evidence is provisional—there is little doubt that metaphors play a much greater role in our mental life than typically is assumed.

448. LAKOFF & JOHNSON, *supra* note 325, at 64-69.

449. FAUCONNIER & TURNER, *supra* note 323, at 40-50.

450. Mitleton-Kelly, *supra* note 256, at 26.

451. Rubin, *supra* note 26, at 50.

452. MCFARLAND, *supra* note 124, at 141.

453. *Id.* at 141-43.

454. Jonathan H. Blavin & I. Glenn Cohen, *Gore, Gibson, and Goldsmith: The Evolution of Internet Metaphors in Law and Commentary*, 16 HARV. J.L. & TECH. 265 (2002). The authors present the metaphor of law as a lever, with human behavior as the sphere and the behavioral model as the fulcrum. Jones, *Proprioception*, *supra* note 189, at 840-42.

tools, slippery slopes, balancing tests, swinging pendulums, narrow ends of wedges, leaps of logic, seamless webs of logic, and logic stretched to the breaking point.⁴⁵⁵ After all, paradigm-changing Supreme Court decisions can hinge on the efficacy of a single metaphor: is Internet access over broadband more like a fully separate offering (pets and leashes), or a fully-integrated offering (cars and windshield wipers)?⁴⁵⁶ It is not uncommon for judges facing new technologies to analogize to better-known technologies. But whether one is employing metaphors correctly is a tricky business.⁴⁵⁷

For now, it may be illustrative to examine how metaphors can release or constrain our thinking about the Internet. Is it appropriate to think that the Internet is a highway (or even a series of tubes)? After all, in its early years, the Internet was seen as the information superhighway. Is the Internet instead a geographic place, like cyberspace? Or is it real property, as some view it these days? Perhaps we should look instead to the organic world for our metaphors—a nervous system, a cell, a rainforest, a coral reef, a flock of birds?⁴⁵⁸ Or is the Internet less a thing than a process, unfolding constantly in space and time, like the formation of thoughts or emotions?

In particular, the physical metaphor of cyberspace as place has one unacknowledged influence on the legal framework for the Internet, including the implication that there is property online that should be privately owned and protected. Many metaphors for the Internet “assume some sort of abstract physical space that may be navigated.”⁴⁵⁹ This leads directly to the “tragedy of the anticommons,” a digital zone of interest where no one is allowed to access someone else’s cyberspace assets without licensing or other permission mechanisms.⁴⁶⁰

As I have argued elsewhere:

Depending on your viewpoint, the Internet at any one moment is a technical architecture (physical assets, logical protocols, and software),

455. Jones, *Proprioception*, *supra* note 189 at 840–41.

456. *Compare* Nat’l Cable & Telecomm. Ass’n v. Brand X Internet Serv., 545 U.S. 967 (2005), *with id.* at 1005 (Scalia, J., dissenting); *see also* Frieden, *supra* note 434, at 253–57 (critiquing the Court’s reliance on competing metaphors to understand broadband technologies).

457. “When courts encounter new technologies not yet anticipated by the law, their reliance on analogical reasoning plays a profoundly important role in the application of proper legal rules. Courts, however, have demonstrated a bad track record in adopting the appropriate analogies or metaphors for these new technologies.” Blavin & Cohen, *supra* note 454, at 267.

458. Why the Web is Like a Rainforest, http://www.stevenberlinjohnson.com/2005/10/why_the_web_is_.html (Oct. 3, 2005).

459. Dan Hunter, *Cyberspace as Place and the Tragedy of the Digital Anticommons*, 91 CAL. L. REV. 439, 515–16 (2003).

460. *Id.* at 441; *see also* MICHAEL HELLER, *THE GRIDLOCK ECONOMY: HOW TOO MUCH OWNERSHIP WRECKS MARKETS, STOPS INNOVATION, AND COSTS LIVES* (2008).

or a complex of providers (who owns, operates, and manages the technical components), or a complex of users and their applications and content, or a substrate for economic and non-economic activity, or a process of human interactions. No single conceptual metaphor can hope to capture all of these elements at once.⁴⁶¹

How about yet another metaphor that may better serve the needs of policymakers? Some have suggested viewing the Internet as something decidedly less noble—a slime mold.⁴⁶² The rationale is simple: slime molds act as a single organism when food is abundant, and operate as a clustered group of organisms when food is scarce.⁴⁶³ “The slime mold [thus] oscillates between being a single creature and a swarm.”⁴⁶⁴ This emergent behavior seems to parallel the differentiated aspects of the Internet as both an organism and a process—much like the individual and collective behavior of all of us.

2. The Fitness Landscape

A particularly powerful way for policymakers to conceptualize social networks, such as business communities, is to compare them to biological ecosystems.⁴⁶⁵ One compelling conceptual tool (and a metaphor in its own right) is the fitness landscape. By way of contrast, neoclassical economists seek a single optimal balance for a particular market, and see growth as a smooth trajectory of improved efficiency and increased output.⁴⁶⁶ Our more complex view of the process acknowledges to the contrary that there are several possible “peaks” of high productivity that operate in different ways, and that it is possible to arrive at those peaks via different “fitness functions.” Indeed, just when one peak has reached its maximum utility (say, bamboo-based light bulb filament), an entirely different approach might offer a far better fit (such as tungsten-based light bulb filament).

461. Whitt & Schultze, *supra* note 1, at 251 n.158.

462. See, e.g., Steven Alan Edwards, *It's Alive*, WIRED.COM, Apr. 1997, http://www.wired.com/wired/archive/5.04/idees_fortes.html (stating the Web is alive “like a gigantic, spouting slime mould,” and expands to fit the dimensions of its environment).

463. Hannah Clark, *Finding Financial Wisdom*, FORBES.COM, July 20, 2006, http://www.forbes.com/2006/07/19/leadership-required-reading-cx_hc_0720reading.html.

464. STEVEN JOHNSON, *EMERGENCE: THE CONNECTED LIVES OF ANTS, BRAINS, CITIES, AND SOFTWARE* 13 (2001). Johnson finds this a perfect representation of emergent behavior of a system in which a bottom-up system with no apparent pacemakers somehow comes together to form a system in which the overall result is greater than the sum of all the individual parts. *Id.* at 12.

465. MARCO IANSITI & ROY LEVIEN, *THE KEYSTONE ADVANTAGE: WHAT THE NEW DYNAMICS OF BUSINESS ECOSYSTEMS MEAN FOR STRATEGY, INNOVATION, AND SUSTAINABILITY* 38-39 (2004). Of course there are some important differences between business and biological ecosystems; in the former, innovation, competition for members, and intelligent actors are more important for success. *Id.*

466. See Whitt and Schultze, *supra* note 1, at 224-26.

The idea of the fitness landscape was introduced by Sewall Wright in 1932, and advanced by Manfred Eigen some sixty years later.⁴⁶⁷ The concept “developed in evolutionary biology [] consists of varying fitness level potentials for an organism in a given environment, with peaks, valleys and plains of the landscape representing the fitness potential of different combinations of behavioral schemata and organism structures.”⁴⁶⁸ Stuart Kauffman explains it succinctly as viewing the adaptive process as individuals “climbing a hill” in a virtual landscape of mountains and valleys, feeling their way through minor variations toward “peaks” of high fitness.⁴⁶⁹ These landscapes represent, metaphorically, the contingent range of possible relationships between a complex adaptive system and its environment, demonstrating that such systems can improve their fitness in a number of ways.⁴⁷⁰

An entity’s fitness depends on its adaptive traits in the landscape: its ability to move up the right peaks.⁴⁷¹ Agents move around their fitness landscapes through mechanisms such as adaptive walks, patching, and jumps.⁴⁷² Natural selection can be seen as enabling organisms to search through vast spaces of possibility toward such peaks.⁴⁷³ Daniel Dennett views the process as one that involves a tight interaction between the organism and the environment, where “the landscape is constantly shifting under your feet.”⁴⁷⁴ Things capable of evolution, like economic systems and individual agents in that system, all live and evolve on landscapes that

467. See, e.g., DANIEL C. DENNETT, *DARWIN’S DANGEROUS IDEA: EVOLUTION AND THE MEANINGS OF LIFE* 190-91 (1999).

468. Cherry & Bauer, *supra* note 53, at 16.

469. STUART A. KAUFFMAN, *AT HOME IN THE UNIVERSE: THE SEARCH FOR LAWS OF SELF-ORGANIZATION AND COMPLEXITY* 154 (1995).

470. HOMER-DIXON, *supra* note 64, at 304-05.

471. Daniel Dennett calls it the Local Rule: “Never step down; step up whenever possible.” DENNETT, *supra* note 467, at 190.

472. Volker Schneider & Johannes M. Bauer, *Governance: Prospects of Complexity Theory in Revisiting System Theory* 27-28 (April 14, 2007) (research paper presented at the annual meeting of the Midwest Political Science Association, copy available at http://www.allacademic.com/meta/p_mla_apa_research_citation/1/9/8/2/9/pages198298/p1_98298-1.php). Some lessons the authors derive from recent work with fitness landscapes include:

- (1) “Normal topographies” with multiple peaks imply there is not only one single successful strategy of adaptation. Often there is a whole series of local optima.
- (2) Specific topographies [path dependency] may imply a kind of “dead end” in the evolution process. . . [because] there is no uphill path from a medium peak to an adjacent higher peak.
- (3) Depending on the shape of the landscape (rugged vs. smooth), variation also can lead to stagnating or even declining fitness. . .

Id. at 27.

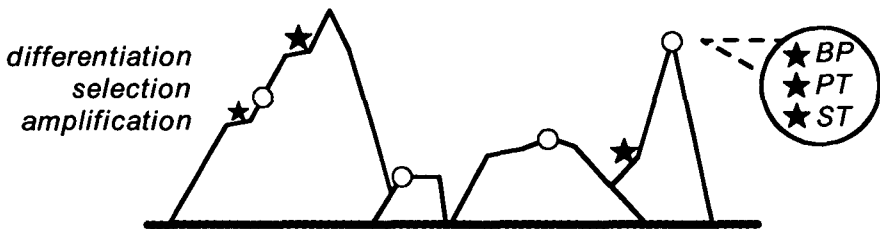
473. KAUFFMAN, *supra* note 469, at 154, 157, 166. Interestingly this fitness landscape metaphor in turn employs the “More Is Up” and less is down bodily metaphoric system. LAKOFF & JOHNSON, *supra* note 325, at 47-48, 49-54.

474. DENNETT, *supra* note 467, at 193.

themselves have a special property: they allow evolution to “work.”⁴⁷⁵ The systems most able to move from one fitness peak to another are those poised “on the cusp between order and chaos,” adventurous enough to look for improved conditions but cautious enough to take advantage of improvements they find.⁴⁷⁶

Coyle offers that “[i]t would be hard to deny, for even the most died-in-the-wool orthodox neoclassical economist, that the framework of evolutionary competition offers a much richer and realistic account of innovation.”⁴⁷⁷ Purposeful, self-reflective agents explore the fitness landscape seeking opportunities for innovation and competing against each other. Technological evolution is coevolution within an economic web, where new technologies enter (like the automobile), drive others extinct (like the horse), and create niches that enable other technologies (like traffic lights).⁴⁷⁸

Markets provide the fitness function for the selection process, perhaps seen (again, metaphorically) as a giant search engine. The notion of fitness implies that combined PTs and STs are used by agents to navigate a market landscape of possible growth trajectories—like a map of mountains. Agents use various strategies to combine PTs and STs into a BP. As one approach reaches its peak limit, one might say that an equilibrium of sorts has been reached—but only until it is upset by a different approach making use of a different combination. Under one variation, this leads to a punctuated equilibrium that is disrupted by “keystone” technologies.⁴⁷⁹



475. KAUFFMAN, *supra* note 469, at 169. These landscapes are said to be “correlated,” not random, because they allow minor mutations to cause both small and large variations, and the terrain itself offers the best clues about the best direction in which to proceed. *Id.*

476. HOMER-DIXON, *supra* note 340, at 305. He believes that Western institutions and culture have developed a self-reinforcing combination that maintains societies at the “fecund boundary between order and chaos.” *Id.* at 306.

477. COYLE, *supra* note 156, at 191.

478. KAUFFMAN, *supra* note 469, at 280-81. Rubin observes that many moral and religious rules demonstrate inherent conflicts between “the biological goal of fitness maximization and the economists’ hypothesized goal of utility maximization.” Rubin, *supra* note 26, at 76.

479. IANSITI & LEVIEN, *supra* note 465, at 69-72.

Ultimately, no one company can hope to out-innovate the market. An ecosystem tends to beat a product (perhaps even something as innovative as the iPod) because its collective of competitors can explore and innovate and invest in many more ideas than any single company can do alone.⁴⁸⁰ Beinhocker observes that “[i]n evolutionary systems, *sustainable* competitive advantage does not exist; there is only a never-ending race to create new sources of temporary advantage.”⁴⁸¹ The bottom line is that “evolution is cleverer than you are.”⁴⁸²

3. The Modular Model

Another overarching conceptual tool for policymakers (and itself a metaphoric construct) is the so-called “layered” approach to communications policy. In a prior paper, I urged adoption of this approach to guide decision making in the communications and information policy space.⁴⁸³ Such a modular model would replace the existing “silos” approach under the Communications Act of 1934, which treats regulated entities and their service offerings in the context of legacy industries.⁴⁸⁴ In other words, the institutions of the Communications Act and FCC regulations, as well as the organizational structure of the FCC itself, no longer fit the realities of the market and the technology.

The layered framework mirrors the actual functional architecture of the Internet. While there are several different ways to think about the modular components of the Internet, the model that appears best to combine simplicity and precision is a four-layered approach: physical, logical, applications, and content.⁴⁸⁵ The top two layers of the model—applications and content—are under the end-user’s control and visible, while the lower two layers—physical and logical—are under the network’s control and invisible to all but the network.⁴⁸⁶ The four-layered model can

480. John J. Sviokla, *In Praise of Ecosystems*, FAST COMPANY, Aug. 1, 2005, at 21, available at http://www.fastcompany.com/magazine/97/open_essay.html.

481. BEINHOCKER, *supra* note 10, at 332.

482. DENNETT, *supra* note 467, at 464 (quoting British biologist Francis Crick’s famous Orgel’s Second Rule).

483. See generally Richard S. Whitt, *A Horizontal Leap Forward: Formulating a New Communications Public Policy Framework Based on the Network Layers Model*, 56 FED. COMM. L.J. 587 (2004).

484. Interestingly, Beinhocker discusses individual “modules” as the components of Business Plans that are subject to differential selection in the market, and in turn match up to evolutionary schemata’s “building-block, combinatorial character.” BEINHOCKER, *supra* note 10, at 283-85.

485. See Whitt, *supra* note 483, at 621-24.

486. Susan Crawford rightly derides the persistent use of “content” as a placeholder for all the myriad activities of the Internet. Susan P. Crawford, *The Internet and the Project of Communications Law*, 55 UCLA L. REV. 359, 390-91 (2007). We must remind ourselves that software applications are merely the tools (the means), while “content” is but one type

be modified to highlight the ways that different players and activities can affect the other modular components of the network.⁴⁸⁷ For example, Timothy W. Wu has recommended that the model be reduced to two layers in order to facilitate understanding by decision makers.⁴⁸⁸ Kevin Werbach, in a compelling paper, has expanded the model to include the interfaces between the layers.⁴⁸⁹ More fundamentally, the first principle of layers is that there is network, and there is “stuff” (mainly software-enabled interactivity) that rides on top of the network.⁴⁹⁰

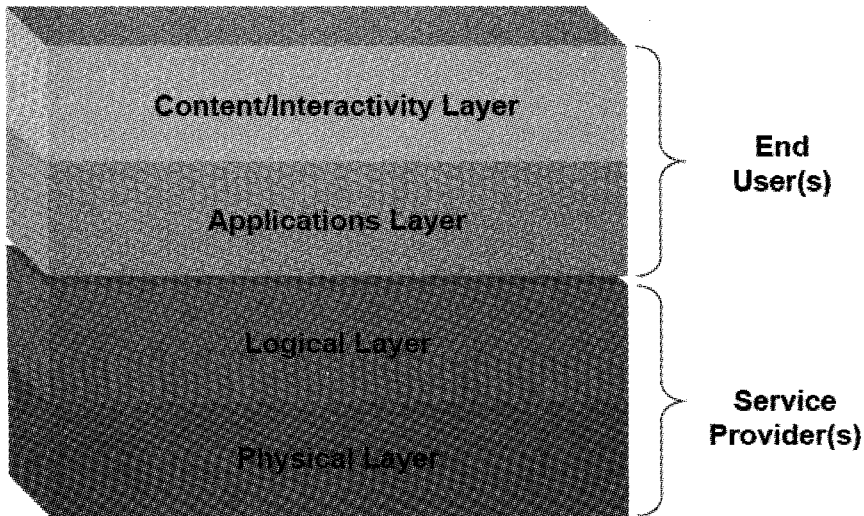
of end “product.” Nor are we mere consumers of content—or in Jerry Michalski’s words, “a gullet whose only purpose in life is to gulp products and crap cash.” The Onda, <http://www.theonda.org> (follow the browse posts by year “2007” hyperlink) (July 26, 2007) (posting entitled First We Trashed “Consumers,” Now We’ve Effed up “Users”). Instead we are creators of value—commercial, social, and personal. Moreover, in important ways Crawford’s “social layer” of “content” encompasses all layers of the Net. Frischmann, *supra* note 397, at 1012-14, 1018 (Innovation is too narrow conceptually to capture the overall social welfare afforded by the Internet; after all, “a significant portion of the content traveling on the Internet is noncommercial, speech-oriented information.”).

487. Networks generally consist of three main elements: links, nodes, and routing information. Each of the horizontal network layers can be divided further into these three elements, as well as subdivided into geographic components. Hendrick Rood, A Primer on Empirically Assessing Strategic Moves in ECS 1-3 (Sept. 2008) (unpublished manuscript, on file with author).

488. Timothy Wu, *Why Have a Telecommunications Law? Anti-Discrimination Norms in Communications*, 5 J. TELECOMM. & HIGH TECH. L. 15, 22 (2006).

489. Kevin Werbach, *Breaking the Ice: Rethinking Telecommunications Law for the Digital Age*, 4 J. TELECOMM. & HIGH TECH. L. 59, 89-92 (2005).

490. Moreover, Romer’s version of new growth theory generally buttresses the concept of the layered approach. See generally Romer, *supra* note 42. As I see it, the different economics of things and ideas (or atoms and bits) matches up well against the division between networks and the myriad interactions enabled by them.



A MODULAR FRAMEWORK

The chief idea behind the layers approach is to allow for “a more concrete analysis of the issues by placing [each] function at a proper layer [of the network] and providing a correct focus on the relevant operation of the Internet.”⁴⁹¹ The layers metaphor is intended to provide a flexible conceptual framework—a visual map—to guide decision making. Just as importantly, the layers framework was intended to inject considerable caution into the policy-making process. My original layers paper urged policy restraint (no dictating), unless there was a compelling regulatory justification and a carefully tailored remedy (enabling).⁴⁹² As noted there, policymakers should not adopt legal regulations that violate the integrity of the layered nature of the Internet, absent a significant regulatory interest and careful consideration of layers-respecting alternatives.⁴⁹³ As I have

491. Whitt, *supra* note 483, at 627.

492. See generally *id.* Werbach echoes that point, stating that one lesson of the layered regulatory model is that “regulators should be increasingly hesitant to impose obligations at higher levels of the protocol stack.” Kevin Werbach, Only Connect 48 (Feb. 20, 2007) (unpublished manuscript, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=964991); see also Frieden, *supra* note 434, at 256 (layered approach provides flexibility and restraint in deciding whether ex ante regulation is necessary).

493. Whitt, *supra* note 483, at 625. As a supreme irony, the FCC recently has promulgated a regulatory regime premised on what can only be described as a “contra-layers” approach: regulate the competitive top layers (VoIP software applications), and deregulate the more concentrated bottom layers (broadband network connectivity). Unfortunately, as discussed previously, the FCC gets this latter element hopelessly muddled in its *Wireline Broadband Order*, *supra* note 430. There the agency declines to regulate broadband networks merely because the end user perceives that they typically are used in conjunction with a particular non-regulated consumer service (Internet access). A little

argued elsewhere, “[g]enerally speaking, the more narrowly the regulation focuses on the layer it is attempting to control, the lesser it will impair other layers, reduce transparency, or cause substantial ‘innocent use’ problems.”⁴⁹⁴ By seeking to preserve the integrity of the Internet, the layers principle also preserves the emergence of innovation, economic growth, and other salient Internet effects.

Moreover, the foundation of the layers framework is the reality of the market we have today, rather than some artificial construct found on a chalkboard. Modularity comports with the technology-based ecosystem at the heart of the communications sector. Marty Fransman states that “[t]he interactions of the players are influenced by the architectural structure within which they exist”⁴⁹⁵—in this case, a layered model. The layers model “emphasizes the interdependence – in both a technical and economic sense – of the different layers.”⁴⁹⁶ Most firms in the New Economy are organizing their work around the reality of the Internet.⁴⁹⁷ Further, Japan’s Ministry of Communications and Information employs a layers model as a conceptual tool.⁴⁹⁸

The static topographical model of a layered platform cannot hope to capture all the complexity and dynamism of the actual Internet, but as discussed earlier, nothing truly can.⁴⁹⁹ Nor is the framework intended to impose a normative value onto the market. The success of “dismodular” companies like Apple is a salient reminder that there are many beneficial market pathways other than modular ones. However, a layered framework can help us understand the various components that collectively lead to that

layered thinking could have gone a long way toward avoiding the tangled mess of the Communications Act that has resulted.

494. Whitt, *supra* note 483, at 637.

495. FRANSMAN, *supra* note 58, at 7.

496. *Id.* at 10. Fransman himself developed what he calls the New ICT Ecosystem Layer Model, or ELM, both as an engineering-architectural and an economic-institutional model, which conceptualizes the ecosystem as a set of functionalities. *Id.* at 22; *see also* Martin Fransman, *Evolution of the Telecommunications Industry into the Internet Age* 37 (2000), *reprinted in* 3 THE INTERNATIONAL HANDBOOK OF TELECOMMUNICATIONS ECONOMICS: WORLD TELECOMMUNICATIONS MARKETS 15 (Gary Madden, ed. 2003); *available at* <http://www.telecomvisions.com/articles/pdf/FransmanTelecomsHistory.pdf> (discussing six layered model of the “info-communications industry”).

497. ATKINSON, *supra* note 49, at 95.

498. FRANSMAN, *supra* note 58, at 9.

499. *See id.* at 37-54. Pierre de Vries argues that the layered model does not adequately represent the dynamics and unpredictability of the Internet. de Vries, *supra* note 85, at 11. While there is no doubt it does not fully capture all market realities, the layers model does represent a relatively stable industry structure, and is relatively easy for policymakers to grasp and utilize in constructive ways. By contrast, de Vries’ metaphor of the internet/web as a forest, *id.* at 13-14, while perhaps a more accurate mental picture, does not appear to help communications policymakers appropriately analyze salient features of Internet-related market phenomena, like VoIP applications or broadband networks.

market success. While not perfect, and perhaps only provisional, layering as a conceptual tool remains clearly superior to today's strangely enduring legal silos, and should be a satisfactory surrogate until the Internet changes into something else or until someone discovers a better conceptual ordering mechanism.⁵⁰⁰ Understood correctly as a conceptual framework, and an analytical tool, the layers model fits nicely in the (metaphorical) toolkit of adaptive policymaking.⁵⁰¹

V. ENABLING VERSUS DICTATING: FURTHER EXPLORING A FITNESS FRAMEWORK FOR POLICYMAKERS

Noted physicist Stuart Kauffman has explained the challenge of creating novel conceptual models for understanding complex systems:

We are seeking a new conceptual framework that does not yet exist. Nowhere in science have we an adequate way to state and study the interleaving of self-organization, selection, chance, and design. We have no adequate framework for the place of law in a historical science, and the place of history in a lawful science.⁵⁰²

He adds that we are just beginning to pick out "strands in the tapestry" of life.⁵⁰³

Despite these daunting challenges, I believe Emergence Economics suggests at least one conceptual framework for policymakers to utilize as they examine public policy issues. No framework is entirely accurate, or even the thing it purports to represent. Indeed, we should resist the urge to boil reality down to a single framing device.⁵⁰⁴ Yet, in the face of a world

500. See, e.g., Bauer & Wildman, *supra* note 63, at 436 (citing the advantages of a horizontal layered model over the silo approach in U.S. policy, but suggesting that "establishing a horizontal framework may not be a long-term sustainable strategy either").

501. A related suggested change to the FCC's current legal structure would replace the current silos of the "wireless" and "wireline" and "media" bureaus with a layered approach divided between conduit and (on a much smaller scale) content. See, e.g., HAL ABELSON, KEN LEDEEN, & HARRY LEWIS, *BLOWN TO BITS: YOUR LIFE, LIBERTY, AND HAPPINESS AFTER THE DIGITAL EXPLOSION* 291 (2008).

The silo organization of the legal structures inhibits innovation in today's layered technologies. Regulation of the content layer should not be driven by an outdated understanding of the engineering limits of the physical layer. Investments made in developing the physical layer should not enable the same companies to control the content layer. . . . Laws and regulations should respect layers, not the increasingly meaningless silos

Id. at 291, 313.

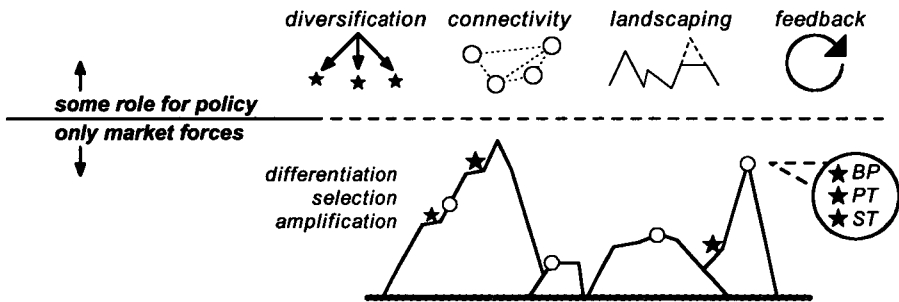
502. KAUFFMAN, *supra* note 469, at 185.

503. *Id.*; see also de Vries, *supra* note 85, at 18 ("It is not possible to set up analytical models for complex systems. Any model that purports to capture the behavior of a system necessarily under-represents it. No model less complex than the system itself can exactly, and in detail, forecast its behavior.") (internal citations omitted).

504. Further, because "simplifications [of reality] are necessary, competing simplifications are essential." ALLISON & ZELIKOW, *supra* note 271, at 8 (emphasis omitted). Having one or more competing conceptual frameworks help remind us of the distortions and

of dynamism and complexity, and even contradiction, we should try to sort through the evidence around us, as best we can.

My proposed conceptual framework stipulates that, where markets are contestable, policymakers should endeavor, at most, to foster the market's processes, rather than interfere with or attempt to replace those processes. This proposed dichotomy would still allow certain "tinkering" with the fitness environment—providing useful inputs, incentives, feedback, and connectivity. However, "the basic workings of the evolutionary algorithm – agents differentiating, selecting, and amplifying various technologies and business plans – should be left to the effectiveness, merits, and complexity of the open market."⁵⁰⁵ The following diagram lays out this dichotomy between acceptable enabling (or "tinkering") and unacceptable dictating (or "tampering"):



The notion of tinkering versus tampering has been recognized elsewhere in somewhat different contexts. For example, Thomas Homer-Dixon believes "[a] decentralized, network-based approach" is best in most market situations (no tampering), but "[s]ometimes a centralized, hierarchical, command-driven approach is essential, even if only as a catalyst or complement [tinkering] to a network-based approach."⁵⁰⁶ Geerat Vermeij similarly points out that diffuse control (no dictating) must be tempered and regulated to some degree by top-down, centralized intervention (enabling), which accomplishes ends that the free market by itself cannot.⁵⁰⁷ And, of course, Eric Beinhocker distinguishes between policies that interfere with economic evolution and policies that help shape the fitness environment.⁵⁰⁸

limitations of whatever framework one employs; "[t]hey open minds a little wider and keep them open a little longer." *Id.*

505. Whitt & Schultze, *supra* note 1, at 304.

506. HOMER-DIXON, *supra* note 64, at 307.

507. See generally VERMEIJ, *supra* note 362.

508. See BEINHOCKER, *supra* note 10, at 426-27.

To be clear, the tinkering inputs are not absolute goods in themselves. They are not optimal for all times and places, or in maximum amounts, but instead are relative to the condition of the market. Indeed, too much choice can be confusing, too much connectivity can be destabilizing, and too much information can be paralyzing. The point is that these four categories of policy inputs seem to match up well to those common market situations where one or more of the corresponding positive economic attributes are lacking to some degree. The context between market realities and policy implements is crucial.⁵⁰⁹

Moreover, where one chooses to draw the line between tinkering and tampering likely will vary from market to market and over time. They occupy a range of options along a continuum, rather than black-or-white decisions. Markets with little to no real competition, and a lack of contestability, may require some form of dictating by government. Further, where there are major structural problems with the institutions or the organizations of a particular market sector, direct intervention that amounts to dictating particular business practices or outcomes may be necessary. However, the general rule should be to tamper only where other, less-intrusive options are unlikely to have the intended effect.

Even so, there are obvious “challenges of tinkering with complex adaptive systems to produce specific intended outcomes,”⁵¹⁰ in part because the coevolution of fitness landscapes “[has] confound[ed] efforts to design change in complex adaptive systems with specific intended results.”⁵¹¹ One lesson is to avoid outcome-oriented policies and focus instead on process.⁵¹² In the following section, I will expand on the notion of dictating versus enabling, and raise some anticipated questions about the suggested framework for ordering the selection landscape.

A. *Do Not Dictate Outputs and Outcomes*

The general policy principle articulated in *Emergence Economics* is that markets should be the primary mechanism for selecting and amplifying technological change, so that policymakers do not interfere in the processes of economic evolution.⁵¹³ Richard Lipsey and his co-authors agree, noting that markets and the market expertise of private sector agents should be

509. “As public policy and private ordering have their respective costs, the appropriate normative question is to find the mix of (imperfect) collective policy arrangements and (imperfect) private ordering that yield the highest aggregate welfare, given the overall vision for the sector.” Bauer & Wildman, *supra* note 63, at 434.

510. Ruhl, *supra* note 65, at 902.

511. *Id.* at 903.

512. Bauer & Wildman, *supra* note 63, at 434-35; *see also* Kouroupas, *supra* note 70.

513. *See generally*, Whitt & Schultze, *supra* note 1, at 304-08.

utilized whenever possible.⁵¹⁴ Allowing government agents to dictate business decisions would amount to suppressing or ignoring market signals.

Trusting the evolutionary process of the market—allowing agents collectively to differentiate, select, and amplify certain modes of service/production—amounts to trusting in the efficacy of the outcome. While the results may not be optimal or efficient for all, the market comes closest to the effective meritocracy we should want. The innovation process involves weeding out the good from the not-as-good. First, policymakers should not be in the habit of creating, proposing, or emphasizing particular market alternatives. This is not to say that there should be no governmental role in encouraging the differentiation process; depending on the market circumstances, some such limited encouragement may have a beneficial impact. Second, policymakers should not have a direct role in business plan selection. Where the appropriate institutions and organizations are functioning at least adequately, market actors should be free to select the physical and social technologies that make up their business plans, and to innovate toward what they think will be the “most fit” for the economic landscape. Selection is the heart of evolution, and the heart of markets. Third, policymakers should not amplify the “most fit” business plans. Amplifying either legacy or new approaches threatens the ability of the market to sort itself out according to the wishes and actions of disparate market players. Instead, amplification should happen at the level of individual agents as they navigate the fitness landscape.

As just one example of this concept, William Easterly points out that the West has spent \$2.3 trillion in foreign aid over the last five decades, and still has not brought concrete results for needy people around the world.⁵¹⁵ Easterly calls those policymakers who mistakenly tend to use top-down, supply-driven interventions to deal with poverty the “Planners.”⁵¹⁶ Easterly claims instead that “[t]he right plan is to have no plan,”⁵¹⁷ with the “Searchers” employing local, demand-drive, bottom-up, accountable, and incentivized approaches, based on trial-and-error experimentation. In his view, only homegrown development, based on the dynamism of individuals and firms in free markets, can achieve the end of poverty.⁵¹⁸ “Big Plans will always fail to reach the beautiful goal.”⁵¹⁹

514. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 46–49.

515. WILLIAM EASTERLY, *THE WHITE MAN’S BURDEN: WHY THE WEST’S EFFORTS TO AID THE REST HAVE DONE SO MUCH ILL AND SO LITTLE GOOD* 4 (2006).

516. *Id.* at 5.

517. *Id.*

518. *Id.* at 100–01.

519. *Id.* at 11.

Of course, as discussed earlier, this approach assumes that the appropriate institutions and organizations are in place and working properly to sustain a viable market in the first place. Markets are artificial constructs, built to accommodate evolutionary forces driving each of us, individually and collectively. In competition law, the relevant concept is whether the market is “contestable” enough (an entity has a realistic opportunity to compete effectively) to warrant no governmental intrusion. Where the market is not functioning as it should, it raises important questions about whether and how government should intervene directly in the heart of market forces. After all, “the material wealth of capitalism arises from human ingenuity, industry, and effort, not magically from a virtuous adherence to the laws of the market.”⁵²⁰

Some may argue that we should not in general defer to the workings of the market because it does not produce optimal results. Why should we trust the markets and evolutionary processes to yield optimal outcomes of BPs, PTs, and STs? After all, our own bodies display the flaws of biological evolution from a strictly functional design perspective—the useless appendix, the choking-inducing esophagus, the blind spots in our retinas.⁵²¹ Should VHS have beaten Beta? Should Explorer have defeated Netscape? Should Google have outlasted Alta Vista? How can we be sure that what happens in the “free” market is in fact optimal? And for whom? Lipsey and his co-authors put it bluntly:

in a dynamic world of uncertainty there is nothing in the market selection process to guarantee that only the fittest will survive, that all the fittest will survive, and that all others will be eliminated—as long as ‘fittest’ is defined independently of survival and not tautologically as ‘those who survive’.⁵²²

They also point out that before a new technology is even accepted by end users in the marketplace, its diffusion is “slow, costly, and often uncertain.”⁵²³

However, an important initial point is that optimal outcomes should be evaluated in terms of effectiveness, rather than efficiency. Markets can be very wasteful in terms of the excess (failed) BPs that are generated and

520. FOLEY, *supra* note 50, at 228.

521. See, e.g., S. Jay Olshansky, Bruce A. Carnes, & Robert N. Butler, *If Humans Were Built to Last*, SCIENTIFIC AM., March 1, 2001, at 50 (citing, among other body design flaws, backward-facing light detection cells between the optic nerve and retina, a common passageway for food and air, and fragile hair cells in our ears); see also MELVIN KONNER, *THE TANGLED WING: BIOLOGICAL CONSTRAINTS ON THE HUMAN SPIRIT* (2003). Neil Tyson amusingly has referred to human genitalia as “an entertainment complex in the middle of a sewage system.” Trevor Bekolay, *Unintelligent Design*, THE MANITOBAN ONLINE, June 18, 2008, www.themanitoban.com/science-technology/unintelligent-design.html.

522. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 47.

523. *Id.* at 87.

discarded. That lack of efficiency, however, should not be confused with the ability of markets eventually to reach fit decisions by churning effectively through the available options. The key is that markets play a critical role in collecting and processing information, as well as keeping power hierarchies in check by providing a fitness function for the selection of BPs. While markets are necessary, useful, and effective, they do not tend to be optimally efficient.⁵²⁴

Thus, decentralized decision making by individual agents in a market wins out over command and control, not because of the market's automatic *efficiency* at resource allocation in equilibrium, but because of its potential *effectiveness* at innovation in disequilibrium.⁵²⁵ "[T]here is not a single economic theory that can show that a totally free market sets the most socially beneficial price for goods, or leads to their optimal distribution."⁵²⁶ Instead, we should take a pragmatic approach to the market, says McMillan, "against the quasi-religious view that it is always right or fundamentally evil. . . . Markets are not magic, nor are they immoral."⁵²⁷ If calibrated properly, markets can avoid the worst tendencies of state hierarchies, while at the same time discipline the worst tendencies of company hierarchies. Neither form of monopoly alone can be trusted.

Again, evolution does not necessarily make optimal solutions. Nor is there a guarantee that change is progress, and near-optimal solutions cannot be predicted.⁵²⁸ "In th[e] dynamic market, the best design does not always win."⁵²⁹ And "no adaptation, and no adapted system, is perfect."⁵³⁰ Nonetheless, "[t]he self-organized critical state with all its fluctuations is not the best possible state, but it is the best state that is dynamically achievable."⁵³¹ The superior recipe for confronting novel change is the maintenance of institutions that permit trial and error experiments to occur.⁵³² The point is that the market, like biological evolution, is optimal in context, and thus the best we can hope to have. If the market itself is

524. BEINHOCKER, *supra* note 10, at 399-403.

525. *Id.* at 402-03.

526. PHILIP BALL, *CRITICAL MASS: HOW ONE THING LEADS TO ANOTHER* 457 (2004).

527. McMILLAN, *supra* note 274, at 226. This sentiment echoes that of Mises: "There is nothing inhuman or mystical with regard to the market. The market process is entirely a resultant of human actions." LUDWIG VON MISES, *HUMAN ACTION: A TREATISE ON ECONOMICS* 258 (4th ed. 2008).

528. Cherry & Bauer, *supra* note 53, at 19.

529. DAVID E. NYE, *TECHNOLOGY MATTERS: QUESTIONS TO LIVE WITH* 43 (2006). Examples he cites include Sony's Betamax and Apple's Macintosh computer, and RCA's ability to resist the adoption of FM radio in the 1930s and 1940s. *Id.*

530. VERMEIJ, *supra* note 362, at 303.

531. PER BAK, *HOW NATURE WORKS: THE SCIENCE OF SELF-ORGANIZED CRITICALITY* 198 (1996).

532. NORTH, *supra* note 151, at 163.

robust and diverse enough, the decision-making process should effectively reflect the interests of the agents.⁵³³

Ideally, the market is a democratic process. Realistically, as we have seen, there are infirmities large and small in the marketplace, depending on factors like the national culture, the industry sector, and the institutional and organizational backdrop. However, where at least the overall structure of the market itself is sound, tampering can be foreclosed, and at most the tinkering process can come into play.

Further, VHS defeating Beta in the VCR standards wars was not necessarily a “market failure,” but an example of a form of complexity effects, a virtuous circle of self-reinforcing growth. The increasing returns on early gains eventually tilted the competition toward VHS, which eventually captured nearly the entire market.⁵³⁴ Eve Mitleton-Kelly notes, as a path dependency, this increasing pull of a new technology in attracting or enabling further development.⁵³⁵ However, this is not a simple or straightforward process; numerous variables are engaged in positive and negative feedback loops. The larger point is that government involvement inevitably would skew the end results of this evolutionary process. Indeed, Brian Arthur argues that history shows that irrational exuberance for competing technology in a relatively unregulated environment leads to speculation, and then crashes, but ultimately to a mature, productive period of confidence and prosperity built on that technology.⁵³⁶ Railroads and canals are two recent examples of such technologies; the Internet is a third.

Plus, the Internet now provides a new and possibly unique platform to better optimize the performance of the market. This is accomplished by putting sellers and buyers in more direct contact, by enabling the Long Tail⁵³⁷ of minority interests not previously served, by removing earlier gatekeepers and other unwanted intermediaries, and by disciplining the

533. An analog is the voting process in a democracy. The whether and how of an individual's decision making in the voting booth should be left to the agent-citizen, so as to best express the will of the people. Just as we should want to refrain from substituting our judgment for that of an agent-citizen, so should we do for an agent-consumer.

534. Eve Mitleton-Kelly, *Introduction*, in *COMPLEX SYSTEMS AND EVOLUTIONARY PERSPECTIVES ON ORGANISMS*, *supra* note 256, at 18. Nye further observes that Sony made the fatal decision not to share its Betamax system with others, in hopes of reaping all the rewards, while rival JVC aligned itself with other manufacturers and licensed them to co-produce its VHS system. NYE, *supra* note 529, at 43.

535. Mitleton-Kelly, *supra* note 256, at 38-39.

536. W. Brian Arthur, *Is the Information Revolution Dead? If History Is a Guide, It Is Not* 1-6 (2002) (unpublished manuscript, on file with author).

537. For an early explanation of the Long Tail, see Chris Anderson, *The Long Tail: Forget Squeezing Millions from a Few Megahits at the Top of the Charts. The Future of Entertainment is in the Millions of Niche Markets at the Shallow End of the Bitstream*, WIREDCOM, Oct. 2004, http://www.wired.com/wired/archive/12.10/tail.html?pg=2&topic=tail&topic_set=.

behavior of market incumbents and those with market power with the threat of quicker, more robust, and more disruptive competitive responses. While the equation may be different in other sectors, these factors change the nature of the government's role regarding the intertwined communications/Internet markets.

A related argument is that the market only responds to the majority interest; minority preferences tend not to get taken up. In *The Tyranny of the Market*, Joel Waldfogel claims that markets are not optimally efficient in bringing forth products that consumers want.⁵³⁸ Even though government can be stupid or "evil" as it intervenes in the market, Waldfogel marvels how "[w]e live in an era of almost limitless faith in markets and almost limitless scorn for government."⁵³⁹ Some of this is undoubtedly true. The tyranny of the majority existing in many markets says that what I get depends on how many others also want it. However, as noted, the Internet enlarges markets by making information, as well as retail goods, available to consumers around the world. The Internet also reduces fixed costs.⁵⁴⁰ As a result, Waldfogel admits that "preference minorities turn to the Internet for liberation from unappealing product options available locally."⁵⁴¹ The Internet helps us find and explore the Long Tail.

B. Do Enable Inputs

Where important policy goals and objectives are at stake, a potentially appropriate role for government is to experiment with different changeable elements of the fitness environment within which the evolutionary algorithm operates. The fundamental point is to improve the market's ability to formulate and present different options (the quantity function), while leaving the selection processes themselves undisturbed (the quality function). Put another way, policymakers should endeavor to coordinate, and not control.

There is room for public policy to define various elements of the selection environment in which agents operate.⁵⁴² In some sense, the basis for the market failure is the inability of agents to fully explore their fitness landscape; this can stem from actions by a market player, or a government player, as well as flawed or failed institutions and organizations. Further, human beings may not be able to overcome their cognitive constraints

538. JOEL WALDFOGEL, *THE TYRANNY OF THE MARKET: WHY YOU CAN'T ALWAYS GET WHAT YOU WANT* 168 (2007).

539. *Id.* at 169.

540. *Id.* at 120-27.

541. *Id.* at 96; *see also id.* 96-99.

542. Cherry & Bauer, *supra* note 53, at 20.

when dealing with marketplace ambiguity or uncertainty, leading to what John Maynard Keynes called the proliferation of spontaneous “animal spirits” in the economy.⁵⁴³ In dealing with these realities, as a general rule, bottom-up processes are better than top-down processes, but only if the right conditions are in place—in particular, choice, transparency, connectivity, and feedback.⁵⁴⁴ “At best, a policy rule can be expected to affect the fitness landscape of the economic system . . . but it can not [sic] guarantee the specific points in the fitness landscape that the economy will traverse.”⁵⁴⁵ Policies “should seek not to manage specific outcomes but enable emerging properties of the economic sector.”⁵⁴⁶

Benjamin Friedman, for one, maintains that while it is a commonly held view that “government policy should try, insofar as it can, to avoid interfering with private economic initiative,” this familiar view is seriously incomplete.⁵⁴⁷ He argues that market forces alone will systematically provide too little growth because “the right rate of economic growth is greater than the purely market-determined rate, and the role of government policy is to foster it.”⁵⁴⁸ However, that perspective is not at all inconsistent with the concept of enabling without dictating, where market forces are employed in service of the larger goals of generating additional innovation, economic growth, and other emergent—and “unpriced”—benefits.

The rough formula for emergence offers us some guidance in the context of communications policy. For example, the existence of constrained yet adaptable agents suggests the need for user education and greater market transparency. Interconnected and dynamic networks suggest a preference for optimal interconnection between different networks, and a balance between network aggregation and disaggregation. Synergistic, fitness-maximizing evolution suggests an important role for open

543. See GEORGE A. AKERLOF & ROBERT J. SHILLER, *ANIMAL SPIRITS: HOW HUMAN PSYCHOLOGY DRIVES THE ECONOMY, AND WHY IT MATTERS FOR GLOBAL CAPITALISM* 3-4 (2009). The authors explain that the five animal spirits of confidence, fairness, corruption, money illusion, and stories are ubiquitous motivators of people, and in the context of U.S. financial institutions require various governmental reforms and regulations. *Id.* at 174-76.

544. Using yet another conceptual metaphor, the profit motive can be seen as “an ever-flowing stream, and, if unattended, it can erode the social fabric . . . and the environment. But, good ground rules can channel competition to serve the public purposes.” FRIEDMAN, *supra* note 208, at 181.

545. Cherry & Bauer, *supra* note 53, at 23. Put another way, some evolutionary economists believe that the invisible hand of the market needs significant amounts of policy assistance, although “‘assistance that distorts’ is a concept that is related to optimality conditions that are unobtainable and hence irrelevant to a growing economy operating under uncertainty.” LIPSEY, CARLAW & BEKAR, *supra* note 92, at 49.

546. Cherry & Bauer, *supra* note 53, at 27.

547. BENJAMIN M. FRIEDMAN, *THE MORAL CONSEQUENCES OF ECONOMIC GROWTH* 14 (2005).

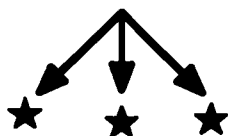
548. *Id.* at 15.

platforms, so that neither public nor private authorities can unfairly constrain the ability of economic actors to differentiate, select, and amplify ideas. Finally, beneficial but unpredictable emergence behavior suggests the need for regulatory humility and skepticism, while also protecting and promoting emergent sources and uses of innovation, generativity, economic growth, and spillovers. These in turn should lead to policies supporting informed and empowered agents, connected networks, unfettered evolution, and full-blown emergence of new ideas.

Thus, consistent with those considerations, and for purposes of this discussion of communications policy, I believe that environmental “tinkering” can be accomplished in at least four different ways: (1) feeding the evolutionary algorithm through diversifying inputs, such as BPs and their accompanying PTs and STs; (2) fostering connectivity between agents, so that physical and virtual communication links are optimized; (3) shaping the fitness landscape in order to create economic incentives and increased market trust for certain activities; and (4) enhancing market feedback mechanisms, to facilitate better decisions through generating greater flows of timely and accurate information.⁵⁴⁹ Again, to suggest these potential steps of supplying inputs, connectivity, incentives, and feedback is not to endorse their use in any or all situations. Only where an overarching policy decision requires some form of market implementation should one or more of these steps even be considered, and perhaps adopted. But if done correctly, these relatively modest measures can provide substantial emergent benefits.

In all respects, policy decisions in these contexts should be seen as a series of experiments that compete to evolve over time. Using the right policy tools, we can prod the market into self-correcting, “steer[ing] itself toward order without over-determining the exact contours of what that order should look like.”⁵⁵⁰

1. Feeding the Algorithm (Innovation and Choice)



The policymaker first can feed the algorithm of evolution by adding additional inputs to the process. These inputs include BPs, PTs, and STs. In some ways,

549. A useful metaphor here, proposed by Professor Lon Fuller, is the tree pruner, where “the law can act as a gardener who prunes an imperfectly growing tree in order to help the tree realize its own capacity for perfection.” David G. Post & David R. Johnson, “*Chaos Prevailing on Every Continent*”: *Towards A New Theory of Decentralized Decision-Making in Complex Systems*, 73 CHI.-KENT L. REV. 1055, 1092 (1998) (quoting Lon L. Fuller, *Adjudication and the Rule of Law*, 54 PROC. AM. SOC’Y INT’L L. 1, 3 (1960)).

550. Matwyshyn, *supra* note 209, at xvii. The author employs an interesting choice of verbs to describe the government’s preferred role, such as “gently nudge,” *id.* at xvi, “nurture,” *id.* at xvii, and “guide,” *id.*

this puts the government metaphorically in the role of a lab technician, providing different plans and technologies for agents to experiment with in the market through selection.

By allowing, and even nudging, additional inputs to feed the algorithm, more optimal amounts of novelty, knowledge, and growth are generated. A diversity of inputs—BPs, PTs, and STs—serves as the raw material for differentiation. Ideas are the key input because they can become innovative business plans (when combined with implementation), physical technologies (when combined with things), and social technologies (when combined with processes). By the same token, supplementing market forces from within via inputs to the emergence algorithm can strengthen the evolutionary process, and yield a richer outcome. Geerat Vermeij notes that “the breadth of inclusion is critical to the discussion of whether and how economic systems operate for the benefit of participants.”⁵⁵¹ The key is to influence the quantity of inputs, without disturbing the quality of decisions derived ultimately from the algorithm itself. As Beinhocker cautions, “[w]e should be realistic about our ability to predict the effects of government shaping of the fitness function and the likelihood of unintended consequences.”⁵⁵²

One reasonably may ask why there is a need for government to generate variety by providing inputs at all. Should not the market naturally evolve every conceivable business plan, and in turn churn through and select the most adaptable (the most responsive to user demand)? In some—perhaps many—circumstances, the answer would be yes, but some—perhaps many—markets are not optimally competitive to yield these BPs. As it turns out, left solely to their own devices, markets tend not to produce optimal amounts of innovative plans and technologies.⁵⁵³

An inescapable conclusion of Paul Romer’s work is the need to find ways to increase economic growth.⁵⁵⁴ He points out that the possibility of creating a permanent increase in the trend rate of growth of income per capita in the United States—from the historic value of 1.8% up to 2.3%—

551. VERMEIJ, *supra* note 362, at 304.

552. BEINHOCKER, *supra* note 10, at 427.

553. Jonathan Sallet points to one recent example: the FCC’s establishment of “openness” requirements for the C Block licensee in the 700 MHz spectrum auction of 2008. JONATHAN SALLETT, “NEW PRODUCTS AT EVERY STAGE” – THE APPLICATION OF COMMON-LAW REASONING IN AN AGE OF INNOVATION 9-10 (2009), available at <http://fcc-reform.org/sites/fcc-reform.org/files/sallet-20090105.pdf>. Sallet adroitly observes that the FCC’s action can be viewed as a narrowly-tailored “experiment” that allowed the agency to set up subsequent market-based “bargaining” between at least two different business models: open and closed wireless networks. *Id.*

554. Paul M. Romer, *Should the Government Subsidize Supply or Demand in the Market for Scientists and Engineers?* 47 (Nat’l Bureau of Econ. Research, Working Paper No. 7723, June 2000), available at <http://www.nber.org/papers/w7723>.

“could resolve all of the budget difficulties associated with the aging of the Baby Boom generation, and still leave ample resources for dealing with any number of other pressing social problems.”⁵⁵⁵ Others have made similar points about the salient effects of growth and a possible state role to stimulate technological innovation. Benjamin Friedman further observes that because economic growth positively affects the character of the society as a whole, “there is a consequent role for policy measures to seek growth beyond what the market would provide on its own.”⁵⁵⁶

Another implication that stems from new growth theory is that free markets tend to produce too little technological innovation relative to what is optimal. The United States, for example, by most accounts, under-invests in basic research.⁵⁵⁷ In the presence of increasing returns from new ideas, Professor Jones argues that Adam Smith’s invisible hand may fail to get things right. In particular, the non-rivalry of ideas means that per capita income depends to a large extent on the total stock of ideas.⁵⁵⁸ For now, the key observation is that, without introducing an additional force to help bridge the gap, the United States may face an ideas deficit in the future.

The reason for such under-investment is no mystery. By all accounts, the market by itself is not sufficient to provide every useful research-related input to the rough formula for emergence.⁵⁵⁹ Given that the welfare benefits of innovative research may be too uncertain, long-term, and diffuse to monetize, let alone control, markets will not allow innovators to capture a sufficient percentage of the welfare benefits they produce.⁵⁶⁰ One key reason that the marketplace alone does not generate sufficient levels of investment in research, Atkinson shows, is a misalignment of economic incentives between the public good and the private good.⁵⁶¹ Thus, the social

555. *Id.* at 11-12.

556. FRIEDMAN, *supra* note 547, at 400.

557. See, e.g., Charles I. Jones, *Sources of U.S. Economic Growth in a World of Ideas*, 92 AM. ECON. REV. 220, 233 (2002).

558. Jones, *supra* note 356, at 1072. Jones notes that U.S. economic growth between 1950 and 1993 can be attributed to two factors: rising levels of educational attainment, and increased research intensity. Together these two factors account for some 80-90% of the growth in output per worker (with the rest due to the rise in employment population). Jones, *supra* note 557, at 235.

559. See, e.g., Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609, 619 (1962) (“[W]e expect a free enterprise economy to underinvest in invention and research (as compared with an ideal) because it is risky, because the product can be appropriated only to a limited extent, and because of increasing returns in use.”).

560. Benjamin & Rai, *supra* note 40, at 12.

561. “[T]he rates of return to society from corporate R&D are at least twice the estimated returns that the company itself receives. Firms’ inability to capture all the benefits of their own innovative activity means that firms, left on their own, will produce less innovation than society needs.” ROBERT ATKINSON & HOWARD WIAL, BOOSTING PRODUCTIVITY,

returns (in this case, of private research and development) exceed the private returns by a substantial margin,⁵⁶² creating what we can think of as a “spillover gap.” These spillovers are good for society because they drive innovations—industries with significant spillovers generally experience more and faster innovation than industries with fewer spillovers—and research and development (R&D) investments by both sides of the market.

Government policies can kill growth or can create incentives for growth.⁵⁶³ One way to feed the evolutionary algorithm is to use the government’s spending authority to channel resources. Many experts have discussed the urgent need for technology policy to support R&D because it is the key fuel of the engine for new economic growth.⁵⁶⁴ Investment in R&D explains a substantial part of the variation in different economic growth rates in different countries.⁵⁶⁵ In short, we need to create further market incentives for both private and public R&D.⁵⁶⁶

Romer believes that the classic R&D model for both governments and firms must be addressed so that command-and-control mechanisms as well as tax-and-subsidy mechanisms are joined with market-like mechanisms that impose market-based tests for success.⁵⁶⁷ He talks about increasing both demand subsidies (government spending on R&D) and supply

INNOVATION, AND GROWTH THROUGH A NATIONAL INNOVATION FOUNDATION 11 (2008), available at <http://www.itif.org/files/NIF.pdf>.

562. Frischmann, *supra* note 361, at 305-06.

563. WILLIAM EASTERLY, *THE ELUSIVE QUEST FOR GROWTH: ECONOMISTS’ ADVENTURES AND MISADVENTURES IN THE TROPICS* 217-39 (2001).

564. As one example, the National Academies of Science issued a paper stating they are “deeply concerned that the scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gathering strength.” NAT’L ACAD. OF SCI., *RISE ABOVE THE GATHERING STORM: ENERGIZING AND EMPLOYING AMERICA FOR A BRIGHTER ECONOMIC FUTURE* 3 (2007). The paper calls for enhancing “the human, financial, and knowledge capital necessary for US prosperity,” in part by increasing federal support for various R&D-related tax credits and providing additional funding for scholarships and fellowships in science, math, and engineering. *Id.* at 4.

565. See ELHANAN HELPMAN, *THE MYSTERY OF ECONOMIC GROWTH* 34-85 (2004).

566. Unfortunately, spending on R&D has slipped considerably in recent years, so that today “federal R&D as a ratio to GDP today is only 0.8 percent, compared to 1.5 percent in the 1960s.” EASTERLY, *supra* note 563, at 192. At the same time, business-funded R&D has almost doubled from 1.19% of GDP in 1980, to 2.02% in 2002, and is now twice as much as government-funded R&D. ATKINSON, *supra* note 49, at 101. Yet in 2004, the United States ranked seventeenth among Organization for Economic Cooperation and Development (OECD) nations in favorable tax treatment of R&D. See Robert D. Atkinson, *Deep Competitiveness*, *ISSUES IN SCIENCE & TECH.*, Winter 2007, at 71, available at <http://www.itif.org/files/Deep-Competitiveness.pdf>. In Romer’s words, “in the last several decades, the efforts that our nation has undertaken to encourage faster growth have been timid and poorly conceived.” Romer, *supra* note 554, at 47.

567. Kevin Kelly, *Paul Romer: The Economics of Ideas*, *WIRED*, June 1996, available at http://www.wired.com/wired/archive/4.06/romer_pr.html.

subsidies (employment inputs).⁵⁶⁸ While approving of demand subsidies such as R&D tax credits, government support for public/private R&D programs, and direct research grants, Romer also highlights an overlooked component: supply subsidies that increase the number of trained scientists and engineers.⁵⁶⁹ Others concur that government should encourage the pace of technological advance through tax credits and investment in R&D, but leave the development of new knowledge to the larger environment.⁵⁷⁰ As the Internet's own origins plainly show, government-sponsored investments in potential future payoffs can help create generative platforms, big and small, for economic growth.⁵⁷¹ There is also a separate demand-side perspective to innovation policy, based on extensive research showing that venturesome consumers adopting and using technology are crucial to maintaining economic prosperity.⁵⁷²

A recent Information Technology and Innovation Foundation report adds further fuel to the R&D debate, finding that “innovations stemming from collaborations with spin-offs from universities and federal laboratories make up a much larger [and growing] share” of all award-winning innovations since 1970.⁵⁷³ The federal government also plays a supportive and important role in this increasingly collaborative U.S. innovation system. The report recommends that the U.S. government expand and secure funding for its technology initiatives and improve coordination of different technology initiatives throughout government and with firms, universities, federal laboratories, and states.⁵⁷⁴ In other words,

568. See generally Romer, *supra* note 554.

569. See *id.* at 21-47.

570. See, e.g., FRIEDMAN, *supra* note 547, at 402.

571. Easterly agrees that the non-appropriability and the obsolescence aspects of innovation mean that the role of technological innovation will tend to be too slow in a market economy. EASTERLY, *supra* note 563, at 178-79. The way out, he believes, is for the state to create strong incentives for innovation, by subsidizing private R&D, promoting government R&D, and encouraging direct investment. *Id.*

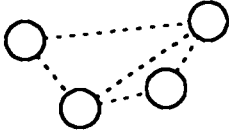
572. See generally BHIDÉ, *supra* note 41. Bhidé further argues that the alleged undersupply in cutting-edge research and researchers is largely unproven. *Id.* at 411-27. Bhidé claims that this lack of evidence should establish a high bar for those who wish to argue for an expansion of public funding for scientific research on the grounds that it will produce high economic returns or other material benefits. *Id.* at 419.

573. FRED BLOCK & MATTHEW R. KELLER, INFORMATION TECH. & INNOVATION FOUND., WHERE DO INNOVATIONS COME FROM? TRANSFORMATION IN THE U.S. NATIONAL INNOVATION SYSTEM, 1970-2006 1 (2008), available at http://www.itif.org/files/Where_do_innovations_come_from.pdf.

574. *Id.* at 3; see also ROBERT D. ATKINSON, INFORMATION TECH. & INNOVATION FOUND., EXPANDING THE R&D TAX CREDIT TO DRIVE INNOVATION, COMPETITIVENESS AND PROSPERITY 1 (2007), available at <http://www.itif.org/files/ExpandR&D.pdf> (including making R&D tax credit permanent and doubling the credit's rate to 40%). There is an important role as well for programs benefiting small businesses and entrepreneurs—which of course are the source of many new ideas and innovations—and economic growth. While

policymakers should find concrete ways to feed the market's evolutionary algorithm.

2. Fostering Connectivity (Institutions and Infrastructure)



The policymaker also can foster connectivity and networking between various agents in the market. This can be done, for example, by strengthening or adding links (lines of communication, whether actual or logical) between

nodes (agents).

New growth will not happen if the right infrastructure, or institutions—of science and the markets, of conventions and rules—are not in place.⁵⁷⁵ The projection of “influence through an ecosystem depends on the *degree* of connectivity and interdependence.”⁵⁷⁶ We have seen the need for social trust engendered by institutions. This trust can form and grow where there is sufficient connectivity between agents. Of course, the Internet is the single best example of a shared infrastructure, emerging from a mix of first public, and then private actions. Thus, policymakers should facilitate ways for agents to interact via the Internet.

One may reasonably ask why the government must take such a role. As pointed out in *Emergence Economics*, the Internet's own history shows that certain forms of user connectivity are not inevitable.⁵⁷⁷ In many countries, broadband policy is dictated by the central government, often with specific mandates on deployment.⁵⁷⁸ In the United States, we have chosen a private ownership system of communications infrastructure. And yet, there is a direct public benefit from new communications and information technology in allowing for the useful interactions and exchange of information among citizens.⁵⁷⁹

The notion that communications policy should serve the public interest is at the heart of the 1934 Communications Act: indeed, nearly 100 statutory provisions direct or authorize the FCC to act in the public

small business gets lip service politically, government programs often fail to match the rhetoric.

575. Ronald Bailey, *Post-Scarcity Prophet: Economist Paul Romer on Growth, Technological Change, and an Unlimited Human Future*, REASON, Dec. 2001, available at <http://www.reason.com/news/show/28243.html>.

576. Mitleton-Kelly, *supra* note 256, at 28.

577. Whitt & Schultze, *supra* note 1, at 251-56.

578. Whitt, *supra* note 401, at 470-71 (Asian and European governments tend to establish more pro-active broadband policies, including public investment and network access mandates).

579. SCHEUERMAN, *supra* note 66, at 201.

interest.⁵⁸⁰ The “public interest, convenience, and necessity” language was first adopted by Congress in the Interstate Commerce Act of 1887,⁵⁸¹ and then borrowed for the Radio Act of 1927.⁵⁸² Subsequently, the Supreme Court proclaimed that the public interest standard “is as concrete as the complicated factors for judgment in such a field of delegated authority permit.”⁵⁸³ Nevertheless, the statutory language is an easy target in some quarters, as it can be hopelessly vague and foundationless.⁵⁸⁴ Regardless of the merits of some of these criticisms, the FCC ultimately is required to explain many of its decisions with reference to that single phrase.

Perhaps one problem is that a unitary public interest standard is insufficient for the multiplicity of uses to which it can be applied. Historically, the language has been used to justify a variety of government programs and regulations related to transportation and communications infrastructure. If there is not one correct way to describe the standard, perhaps we should go back to its roots, and recast it as a series of interrelated public interests. More specifically, we can tie the standard to one or more “tinkering” projects within the FCC’s jurisdictional purview, in an attempt to provide More Good Ideas via additional agent connectivity. Such a vision of public interests invariably would appreciate the collective economic and social benefits of openly interconnected market agents.

3. Shaping the Landscape (Incentives and Trust)



Encouraging greater increases in income over a shorter period of time arguably is the “central economic policy task of any nation.”⁵⁸⁵ And in that quest, incentives for growth obviously matter.⁵⁸⁶

The policymaker here can serve as a “fitness function shaper,” which amounts to acting so that “the evolutionary processes of the market can be better shaped to serve society’s needs.”⁵⁸⁷

580. Randolph J. May, *The Public Interest Standard: Is It Too Indeterminate to Be Constitutional?*, 53 FED. COMM. L.J. 427, 457-67 (2001).

581. Interstate Commerce Act of 1887, ch. 104, 24 Stat. 379 (current version in scattered sections of 49 U.S.C. (2000)).

582. Radio Act of 1927, ch. 169, 44 Stat. 1162 (codified at 47 U.S.C. § 302(a) (1934), and repealed 1936).

583. *FCC v. Pottsville Broad. Co.*, 309 U.S. 134, 138 (1940).

584. See, e.g., Erwin G. Krasnow & Jack N. Goodman, *The “Public Interest” Standard: The Search for the Holy Grail*, 50 FED. COMM. L.J. 605 (1998); see also May, *supra* note 580.

585. Crawford, *supra* note 486, at 29.

586. EASTERLEY, *supra* note 563, at 177.

587. BEINHOCKER, *supra* note 10, at 427.

Because incentives provide useful signals to all agents in the market, the best way to use the fitness landscape to achieve policy objectives is to employ market-based incentives. “Policy can use incentives or disincentives that are either generally applied or narrowly focused.”⁵⁸⁸ This can be achieved by, for example, setting broad policy goals and then allowing agents operating under unfettered economic and non-economic conditions to meet those goals. By shaping the metaphoric landscape in which agents operate—providing incentives to scale particular mountains, or supporting the discovery and sharing of path shortcuts—policymakers can encourage policy objectives without interfering with the core activity of evolution.

Dan Kahan notes that correctly understanding human behavior extends beyond the conventional view (that incentives are a solution to collective action problems) and embraces the strong reciprocity view that agents can be motivated by honor and altruism to contribute to the public good if they see others behaving cooperatively.⁵⁸⁹ Conversely, incentives sometimes can magnify collective actions problems by dissipating trust. The simple existence of an incentive scheme can be seen as a clue that other agents are not inclined to cooperate voluntarily; if they were, incentives would be unnecessary.⁵⁹⁰ Maximum cooperation probably requires that reciprocity dynamics be supplemented with appropriately tailored incentives, most likely in the form of penalties aimed specifically at persistent free riders.⁵⁹¹

Unfortunately, recent FCC activities constitute a negative counterpoint. As mentioned above, over the past several years, the FCC inexorably has imposed various carrier-style regulations on a swath of VoIP applications and services. This trend threatens to stifle innovative new applications, and reduce—not amplify—the range of More Good Ideas. The means employed by the FCC—creating specific technology mandates for programs like E-911 (enhanced emergency services), CALEA (Communications Assistance for Law Enforcement Act), CPNI (Customer Proprietary Network Information), TRS (Telecommunications Relay Service), and USF (the federal universal service fund)—often go well beyond tinkering via market incentives, and involve tampering with the actual process of evolving solutions.⁵⁹² In particular, rather than establishing broad guidelines or general mandates for VoIP technology

588. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 499.

589. Kahan, *supra* note 312, at 346.

590. *Id.*

591. *Id.*

592. The point is not necessarily that these programs should not apply to VoIP applications—which is subject to debate—but rather how and when they should apply.

providers to meet within a prescribed period of time, the FCC instead tends to impose specific, backward-looking mandates with legacy systems. The concern is that by tampering with the evolutionary processes, the FCC actually is hampering the growth and innovation of these technologies.

One reasonably may ask why we should rely on agents' pecuniary incentives. The answer is that makers of technology respond to market incentives, just like everything else. Because the firm does not benefit from all of the knowledge it has created, its incentives to innovate are lowered somewhat. However, Easterly points out that society ultimately gains in this tradeoff because each innovation permanently increases the productivity of the economy.⁵⁹³

Incentives need not be purely pecuniary, or even material. "[G]reater financial incentives don't always elicit more effort . . . [or] produce better results."⁵⁹⁴ As we saw with emergent phenomena, many forms of net effects take the form of either non-traditional economic activity (like peer production), or non-economic activity. While Old School Economics tends to slight these types of incentives, Emergence Economics recognizes that they readily drive human behavior and thus should not be ignored. "Effective policies are those that support socially valued outcomes not only by harnessing selfish motives to socially valued ends, but also by evoking, cultivating, and empowering public-spirited motives."⁵⁹⁵ As one set of researchers puts it:

The behavioral sciences have traditionally offered two contrasting explanations of cooperation. One, favored by sociologists and anthropologists, considers the willingness to subordinate self-interest to the needs of the social group to be part of human nature. Another, favored by economists and biologists, treats cooperation as the result of the interaction of selfish agents maximizing their long-term individual material interests. [We show that] a significant fraction of people fit neither of these stereotypes. Rather, they are conditional cooperators and altruistic punishers . . . which we call strong reciprocators.⁵⁹⁶

More recent research of strong reciprocity in the social sciences suggests another complementary approach: instilling trust. Individuals who have faith in the willingness of others to contribute their fair share in a joint enterprise will voluntarily respond in kind.⁵⁹⁷ In fact, manipulating material

593. EASTERLY, *supra* note 563, at 178. Easterly goes on to argue that in these situations, "[m]arkets will often need an injection of government subsidies to start the knowledge ball rolling." *Id.* at 155.

594. BHIDÉ, *supra* note 41, at 419.

595. Herbert Gintis, et al., *Introduction*, in *MORAL SENTIMENTS AND MATERIAL INTERESTS*, *supra* note 312, at 4 (emphasis omitted).

596. Herbert Gintis, et al., *Preface*, in *MORAL SENTIMENTS AND MATERIAL INTERESTS*, *supra* note 312, at xi (emphasis omitted). They further argue that "strong reciprocity is the product of gene-culture coevolution" in human beings. Gintis, et al. *supra* note 596, at 23.

597. Kahan, *supra* note 312, at 342.

incentives may be a self-defeating strategy, at least by itself, because it signals that others would not be inclined to cooperate voluntarily and are prone to cheat if possible. As Kahan notes, “[i]ncentives do more than affect individuals’ calculations of the costs and benefits of particular forms of conduct; they also shape their impressions of the attitudes and intentions of those around them.”⁵⁹⁸ Fitness landscape shaping can be accomplished best through a mix of incentives and trust cues, where both competition and cooperation naturally flow from the overall incentives system.

4. Enhancing Feedback (Transparency and Accountability)



Justice Brandeis famously remarked that “[p]ublicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most efficient policeman.”⁵⁹⁹ A final form of tinkering involves creating or enhancing market feedback mechanisms, essentially filling in various information or transparency gaps in the market. This means providing agents with more and better data, and perhaps enhanced decision-making tools, so they can make informed decisions. Ultimately, more information also involves holding agents (public and private alike) accountable for their actions.

Markets rely on information in order to function properly. Conversely, “[s]imple market solutions are stymied by informational problems.”⁶⁰⁰ Agents as consumers or users typically lack complete information and foresight to make informed choices among goods and services and can be easy victims in a marketplace tilted against them.⁶⁰¹ Bounded rationality, asymmetric information flows, cognitive biases, linear thinking, and more suggest that users often stand little chance when negotiating with more powerful agents.⁶⁰² The policymaker can help even the odds, at least to some degree. Because consumers and users are adaptable and able to learn and grow, policymakers should give them what they need to take that leap: more information and a voice. With such tools, these agents then can hold accountable for their actions those in both the private and public sectors.

598. *Id.* at 346.

599. LOUIS D. BRANDEIS, *OTHER PEOPLE’S MONEY AND HOW THE BANKERS USE IT* 92 (1914).

600. FRIEDMAN, *supra* note 208, at 180.

601. *See* ARCHON FUNG, MARY GRAHAM & DAVID WEIL, *FULL DISCLOSURE: THE PERILS AND PROMISE OF TRANSPARENCY* 6 (2007).

602. Normally, we humans tend to act only when the situation is, in Professor Helen Ingram’s words, “soon, salient, and certain.” Andrew C. Revkin, *Meltdown: Yelling “Fire” on a Hot Planet*, N.Y. TIMES, Apr. 23, 2006, at 41.

Transparency is known to be a useful mechanism for managing the volatility in complex systems.⁶⁰³ The feedback process typically is seen in terms of positive and negative feedback, but in human systems the degree of connectivity (as discussed above) often determines the strength of feedback.⁶⁰⁴ True feedback means influence that changes the potential actions and behavior of other agents, and thus can influence the state and pace of coevolution.⁶⁰⁵

Transparency systems increasingly are emerging as a mainstream regulatory tool,⁶⁰⁶ where the guiding idea is that public intervention can “create economic and political incentives that advance specific policy objectives.”⁶⁰⁷ By mobilizing individual choice and market forces, targeted transparency can serve in the place of heavier-handed regulation.⁶⁰⁸ Government-sponsored ratings of rollover risks for automobiles are but one example, where knowledgeable consumers can shop accordingly and auto manufacturers can respond with safer automobiles.⁶⁰⁹ Transparency can also facilitate greater public participation in the formal rulemaking process.⁶¹⁰ Of course, transparency is of little value without accountability. Successful information access regimes require some form of bureaucratic apparatus, watchdog groups, or other organizations/institutions to uphold the requirement.⁶¹¹

603. de Vries, *supra* note 85, at 42.

604. Mitleton-Kelly, *supra* note 256, at 37-38.

605. *Id.* at 38.

606. Indeed, “transparency” was *Webster’s Dictionary’s* Word of the Year in 2003. See Ann Florini, *Introduction: The Battle Over Transparency*, in *THE RIGHT TO KNOW: TRANSPARENCY FOR AN OPEN WORLD 2* (Ann Florini ed., 2007).

607. ARCHON FUNG, ET AL., *ASH INST. FOR DEM. GOVERNANCE & INNOVATION, THE POLITICAL ECONOMY OF TRANSPARENCY: WHAT MAKES DISCLOSURE POLICIES EFFECTIVE?* 1 (2004).

608. FUNG, GRAHAM & WEIL, *supra* note 602, at 5.

609. The U.S. National Highway Transportation Safety Administration (NHTSA) recently concluded that publishing the static stability factors (SSFs) for sports utility vehicles (SUVs) and other large automobiles has resulted in a marked improvement in the overall safety of those cars. See MARIE C. WALTZ, *NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., TRENDS IN THE STATIC STABILITY FACTOR OF PASSENGER CARS, LIGHT TRUCKS, AND VANS* (2005), available at <http://www.nhtsa.dot.gov/cars/rules/regrev/evaluate/809868/images/SSFTrend%20final.pdf>.

610. Cary Coglianese, Heather Kilmartin & Evan Mendelson, *Transparency and Public Participation in the Rulemaking Process: A Nonpartisan Presidential Transition Task Force Report*, (Univ. of Pa. Law Sch. Pub. Law & Legal Theory Research Paper Series, Research Paper No. 08-41, 2008), reprinted in 77 *GEO. WASH. L. REV.* (forthcoming 2009), available at <http://ssrn.com/abstract=1292911>. The task force recommends 26 different ways to improve the transparency, public participation, and strategic management in federal agency processes. *Id.* at app. 1, at 30-32.

611. See, e.g., Florini, *supra* note 607 at 337.

Information disclosure also can be seen as part of an incentives system, creating an impetus for entities to improve services or comply with regulations. The effectiveness of a transparency regime—“[r]egulation by [r]evelation”⁶¹²—stems from how “embedded” the information becomes “in the everyday decision making routines of users and disclosers” alike.⁶¹³ One suggested “role for public policy is to gather and provide as much information as is possible for agents involved in adoption decisions before particular trajectories become locked in.”⁶¹⁴ Policymakers can assist in improving information flows between users and producers, and in the process “hold the door open” to allow producers “to evolve, agents to learn, and possible mistakes to be avoided.”⁶¹⁵

Of course, transparency is not a cost-free solution. Mandating more public information is not always better, as it can impose significant disclosure burdens on corporations and government alike. Transparency also can confuse the user, be captured by narrow interests, grow outdated, and waste resources.⁶¹⁶ In fact, done badly, a transparency mandate can be damaging to its own interests, yielding information that is “incomplete, inaccurate, obsolete, confusing, or distorted.”⁶¹⁷ The key is to balance these potential downsides against the additional benefits of facilitating a smoothly-operating market.⁶¹⁸

One example of the need for feedback mechanisms comes from the FCC’s spectrum policy. Jim Snider calls spectrum the “invisible resource” due to the public’s scientific ignorance of spectrum’s physical and economic properties, the unprecedented nature of spectrum applications, and various government decision-making processes.⁶¹⁹ Snider offers up a host of intriguing substantive and procedural changes to raise the visibility

612. *Id.* at 339.

613. FUNG, ET AL., *supra* note 608, at 4. By one account the ultimate level of transparency is reached when “there is a successful attempt to integrate stakeholder communication into the governance processes of the organization.” ADRIAN HENRIQUS, CORPORATE TRUTH, THE LIMITS TO TRANSPARENCY 165 (2007).

614. LIPSEY, CARLAW & BEKAR, *supra* note 92, at 80.

615. *Id.*

616. FUNG, ET AL., *supra* note 608, at 3.

617. FUNG, GRAHAM, & WEIL, *supra* note 602, at 7.

618. Obviously, the Internet can help create a new generation of more effective transparency policies, with users able to compile data themselves and utilize more interactive, customized, and scalable interfaces. *Id.* at 15, 152-53.

619. J. H. SNIDER, NEW AM. FOUND., THE ART OF SPECTRUM LOBBYING: AMERICA’S \$480 BILLION SPECTRUM GIVEAWAY, HOW IT HAPPENED, AND HOW TO PREVENT IT FROM RECURRING 23 (Aug. 2007), available at http://www.newamerica.net/publications/policy/art_spectrum_lobbying (quoting HARVEY J. LEVIN, THE INVISIBLE RESOURCE: USE AND REGULATION OF THE RADIO SPECTRUM (1971)). He points out that the U.S. government has raised some \$40 billion since 1993 in spectrum auctions, *id.* at 17, while the estimated value of the spectrum usage rights approaches \$480 billion, *id.* at 1.

level of spectrum as a natural resource, including reducing database complexity, improving tracking capabilities, rationalizing the license modification process, and automating the build-out requirements.⁶²⁰ Many of these ideas mesh nicely with the tinkering approach recommended earlier in this Article to boost user transparency and establish a sound fitness environment to accommodate greater competition.

A salient question is where transparency ends and deliberate steering begins. Richard Thaler and Cass Sunstein have developed what they call “libertarian paternalism,” which seeks to preserve the ability of people to choose freely in the market, while allowing institutions to make self-conscious efforts to steer people’s choices in welfare-improving directions.⁶²¹ Where imperfect competition is unable to protect the interests of irrational consumers, the authors propose enlisting default rules, framing effects, and starting points to assist vulnerable third parties.⁶²² Malcom Gladwell also suggests making information more “sticky” by tinkering with its presentation.⁶²³

While the Thaler and Sunstein philosophy sounds similar to the proposed “enable, don’t dictate” dichotomy, I am somewhat less sanguine about granting policymakers too much leeway to “steer” people’s choices in any particular direction. Gregory Mitchell points out that paternalism is not inevitable because individuals can improve their decision-making skills by overcoming their irrational influences.⁶²⁴ The approach sketched out here celebrates a different freedom of choice: for example, by giving people both a greater number of choices, and a more informed freedom.⁶²⁵

Further, as research has shown, the human brain is extraordinarily “plastic,” an attribute that persists throughout our adult lives.⁶²⁶ That plasticity is the product of ecological requirements during our prehistory. “[W]e are good at learning the kinds of things it was adaptive for us to

620. *Id.* at 37-48.

621. See RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* (2008); Cass R. Sunstein & Richard H. Thaler, *Libertarian Paternalism is Not an Oxymoron*, 70 U. CHI. L. REV. 1159, 1162-63 (2003).

622. Sunstein & Thaler, *supra* note 622, at 1162-67.

623. MALCOLM GLADWELL, *THE TIPPING POINT: HOW LITTLE THINGS CAN MAKE A BIG DIFFERENCE* 259 (2000).

624. Gregory Mitchell, *Libertarian Paternalism Is An Oxymoron*, 99 NW. U. L. REV. 1245, 1258 (2004-05). He also argues that choosing welfare over liberty is not justified and that libertarian paternalism shifts resources from rational to irrational people. *Id.* at 1248.

625. Hayek understood that true individualism “regards man not as a highly rational and intelligent but as a very irrational and fallible being, whose individual errors are corrected only in the course of a social process, and which aims at making the best of a very imperfect material.” F. A. HAYEK, *INDIVIDUALISM: TRUE AND FALSE, THE TWELFTH FINLAY LECTURE DELIVERED AT UNIVERSITY COLLEGE, DUBLIN, ON DECEMBER 17, 1945* 9 (1948).

626. See, e.g., JEFFREY M. SCHWARTZ & SHARON BEGLEY, *THE MIND AND THE BRAIN: NEUROPLASTICITY AND THE POWER OF MENTAL FORCE* (2003).

learn rather than to inherit as hard-wired competencies.”⁶²⁷ People can and do learn, and improve their skills, due to the functional plasticity of the brain.⁶²⁸

Importantly, even if people cannot always overcome their cognitive constraints, they should be given the opportunity to make “wrong” decisions, and thereby learn, adapt, and improve in their ability to make future decisions. “[L]iberty accords people ownership of their story, including their errors and vices, and thereby allows them to learn the contours of action, experience, and consequence.”⁶²⁹ Moreover, because policymakers suffer from similar cognitive constraints, direct state involvement in citizen choice likely introduces its own distortions.

That said, it may make sense to incorporate some minimal “nudges” to delineate certain types of consumer decisions⁶³⁰—especially those that are difficult, infrequent, or have delayed effects—which may require greater assistance. After all, “choice architecture” may be unavoidable in some cases. While the first premise of this tinkering tool is to improve decision making in a neutral context, deliberate framing and default rules should be considered only in specific situations—such as with financial or health care information—where a stand-back approach proves to be inadequate to achieve the social goal of more informed (and informing) decision making. Hopefully, this balancing of interests actually would strengthen, rather than hinder, the liberty and autonomy of the individual.

VI. CONCLUSION

While far short of furnishing a comprehensive overview or definitive answers to specific policy questions, this Article hopefully at least has provided some useful grounding for a more adaptive form of policymaking. In *Emergence Economics*, we showed how market systems are more rich, dynamic, and unpredictable than Old School Economics and its proponents had assumed. Here, I have explained how public officials should look to not just an expansive view of markets, but also a more well-rounded view of policymaking. Not only are markets more complicated than generally thought, but public policy is about more than markets. And all of this incredible nuance and complexity springs from a myriad of daily human interactions that often elude the simplistic categories of “market” or “state.”

627. SEABRIGHT, *supra* note 164, at 243.

628. Erin Ann O’Hara, *Brain Plasticity and Spanish Moss in Biolegal Analysis*, 53 FLA. L. REV. 905, 923 (2001) (arguing that there are limits to our ability to manipulate environments to change the physical structure of the brain).

629. Daniel B. Klein, *Statist Quo Bias*, 1 ECON J. WATCH 260, 263 (Aug. 2004), available at <http://www.econjournalwatch.org/pdf/KleinCommentAugust2004.pdf>.

630. THALER & SUNSTEIN, *supra* note 622, at 76-77.

Much like the market itself, the cycle of political decision making is non-linear, dynamic, and complex—a “garbage can” of people and processes, in Kingdon’s memorable phrase.⁶³¹ Still, the right organizations selecting the right institutions, and employing the right frames and tools, can best assess the available constraints and opportunities. This boils down to the limiting of active policy functions in order to devise market inputs, while constantly adjusting to the market’s emergent phenomena.

This Article has argued that a guiding public policy framework can be achieved successfully using a “tinker, don’t tamper” formula. Where markets are contestable, and enabling institutions well-functioning, policymakers generally should avoid *dictating* (tampering with) the primary evolutionary forces of market players differentiating, selecting, and amplifying particular business plans and technologies. Instead, and only where necessary, policymakers should rely on *enabling* (tinkering with) tailored market gaps and inputs to what can be thought of as the “econosphere.” The fundamental point is to improve the market’s ability to formulate and present different options to agents, while leaving the selection processes undisturbed.

Thus, absent state or market failure, the government’s role, at best, should be to experiment with the optimal background conditions for a dynamic, unpredictable, and evolving environment. In particular, adaptive policymakers should determine whether and how to tinker with the market’s inputs, connectivity, incentives, and feedback—and then stand back to let the process itself unfold. With empowered agents working through connected networks via evolutionary processes, we are far more likely to unlock the full-blown emergence of new ideas and innovation of economic growth and other net effects.

Unfortunately, our nation’s leaders just now are beginning to realize how a financial system bereft of the proper institutional arrangements can go so drastically awry, leaving no choice but to step in and dictate massive structural interventions. Such a fate was not inevitable. Only when private markets and public policies learn to work constructively with each other, and not in needless conflict, can the resulting emergent benefits be more fully realized in our everyday lives.

631. KINGDON, *supra* note 124, at 84.