Review of *Complexity and the Art of Public Policy: Solving Society's Problems from the Bottom Up*, by David Colander and Roland Kupers, Princeton University Press, 2014,
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Complexity and the Art of Public Policy: *Solving Society's Problems from the Bottom Up*. By David Colander and Roland Kupers. Princeton University Press, Princeton, NJ and Oxford, UK, 2014. 310pp., $29.95. ISBN 987-0-691-15209-7.

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This book both inspires and frustrates; its goal is to shift the core narrative of policy debate regarding markets, government, goals, and the predictability of outcomes.

The authors contrast the "standard" policy framework, which encompasses both market fundamentalism and top-down government intervention, with a complexity framework. Despite notable differences, the two standard approaches share traditional economic reasoning based on predictable rational behavior and an exogenous government. Market fundamentalism identifies problems with top-down government policy, but fails to adequately consider market failure, ethical problems with materialist orientation, and myriad interactions. Analogously, the top-down approach understates the many limitations of government. Both approaches fail to address boundaries of rationality, the endogeneity of preferences, the importance of social norms, and limits on predictability. Both unduly separate market and government dynamics.

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The complexity framework, by contrast, stresses the coevolution of markets and government and employs multiple perspectives, including standard models, with the goal of influencing the ecostructure of decision-making and the evolution of bottom-up interactions toward desirable social outcomes: laissez-faire activism. The book opens with an apt metaphor: the standard framework operates atop a mountain where observers see only portion of the surrounding terrain; complexity stands on a higher peak, but to get there analysts must first descend the standard peak.

The argument proceeds in four steps. First, reviewing the history of economic thought, the authors assert that during the twentieth century economic theory lost an earlier attention to complexity dynamics. Adam Smith's *Theory of Moral Sentiments* argued that ethical sentiment (trust) underlies market transactions. Classical economic theory provided guiding principles of economic welfare, rather than specific prescriptions. Unlike market fundamentalism, it did not rule out a significant government role, but encouraged "long and hard thinking, prior to giving policy advice that included a government role" [p. 75]. After the 1930s, economics abandoned this broad vision. Walrasian microeconomics, neo-

Keynesianism, and new classical macroeconomics, despite mathematical formality, rely on simplified notions of causality, with excessive emphasis on generating predictions that obscure important dynamics.

Second, the authors discuss developments in complexity theory and contemporary economics as foundations for complexity policy. Based on nonlinear dynamics, fractal geometry, coevolution, network analysis, and agent-based computer modeling, complexity can explain interactive phenomena such as paths of bird flocks and the occurrence of avalanches or forest fires. Here, randomness is not exogenous; it arises from internal dynamics.[1] Although complexity precludes tractable forecasting, it permits a substantive analysis of dynamic processes (e.g., path dependency with punctuated equilibria). Complementary economic developments include: a behavioral emphasis on context-dependent preferences and cognition; enhanced attention to norms, institutions, increasing returns, tipping points, punctuated equilibria, and evolutionary processes; a focus on identifying empirical patterns (e.g., in financial data); modern game theory, and social network analysis.[2]

Third, using this foundation, the authors outline their approach. A laissez-faire activist government should seek to influence development paths by shaping ecostructures of decision-making from the bottom-up. Accounting for extant norms, policy should encourage social entrepreneurship in all sectors, along with adaptability and pro-social norms. A possible disparity between current and desired norms is analogous to one between individual behavior and self-aspirations. Government should be a steward of social property; it should promote R&D and demand a return on its investments (e.g., NIH research) when offering patents. Two specific policy examples are constructing new sidewalks in order to fight crime in Bogata and the emphasis of German environmental policy on altering social norms of energy use.

Fourth, to foster a complexity orientation, the authors propose reorienting the university social science curricula. They propose a five-module transdisciplinary approach: (1) statistics and sociometrics – an empirical foundation; (2) modern game theory – for conceptualizing social problems, with influences of norms, culture, and class;[3] (3) complexity modeling at micro and aggregate levels; (4) a philosophical and methodological approach to the historical origins of social scientific inquiry; and (5) a humanist approach to the limitations of social science.

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As this summary suggests, this book has laudable strengths. Nonetheless, it lacks specificity in areas that would be consistent with its broad objectives.

The book stresses three unnecessarily stark dichotomies.

First, standard policy versus complexity. While their standard framework can characterize much economic policy literature and debate, this dichotomy fails to account for multiple nuances, including how elements of microeconomics (recent and less recent) span portions of the divide between the two metaphorical peaks, and especially how segments of the policy literature merge disciplines in a manner compatible with a complexity approach.[4] For too much of the narrative, the standard framework appears as a straw position.

Second, bottom-up versus top-down policy. This dichotomy can characterize flows of influence in hierarchies and appear in much policy literature; yet it overlooks multiple interactions between governmental and non-governmental actors. Other than an implicit notion that government alone exerts power, there is no discussion of how power (in or outside of government) affects policymaking.[5] Even Weimer and Vining's (1991, p. 30) standard policy text states: "The policy analyst, however, deals primarily with collective action involving the legitimate coercive powers of government." Surely if government is endogenous in a complexity framework, multiple parties, including market participants, will use power to influence policy. If so, the top-down versus bottom-up dichotomy breaks down. A stronger but compatible discussion would consider how of power complicates distinctions between "top" and "bottom" and how such complications enter a complexity policy framework.

Third, control versus influence. This divide is particularly problematic; much economic and policy literature advocates influence rather than control, as in altering "rules of the game" so as to adjust the context in which individuals make decisions (e.g., taxing negative externalities). Surely the authors understand this point, but the control/influence dichotomy obscures it and fails to offer any depth on how to conceptualize various influences in a complexity framework. Moreover, the entire policy evaluation literature (and much practice) rests on the proposition that policy control, or even predictable influence, is usually problematic.[6] Why else evaluate? A more fruitful distinction would contrast relatively predictable influence on average behaviors with less direct and longer-term influence on evolutionary paths. While the book clearly makes this second distinction in a few places, the

repeated use of control versus influence oversimplifies underlying complexities, even from the perspective of a relatively standard approach.

Finally, I would have liked to see more guidance. The idea of applying complexity theory to policy is appealing, yet I find full-blown complexity theory too complicated to apply. How does one traverse the large gap between the two peaks? How might specific concepts from recent policy and economic literatures guide a complexity approach to policy? Chapters 11–13 take a few steps in this direction, but more specificity would have strengthened the book considerably.

A modest suggestion. Complexity theory implies punctuated-equilibrium dynamics. While the timing and nature of dramatic punctuations are hard to predict (e.g., 2008), periods of stability allow much broader predictability. Standard tools, adjusted as needed for context-dependent preferences and social norms, can apply – with the caveat that punctuation can completely alter outcomes.[7] A clearer notion of punctuation might emerge from more attention to how the dynamics of specific kinds of interactions influence propensities to cross relevant critical-mass tipping points – perhaps illuminating the gap between the two mountains.[8]

Overall, while frustratingly general in important respects, this book challenges overused dichotomies between government and market and inspires new approaches to conceptualizing how policy interacts with continuously evolving broader social–political–economic environments.

References

Arthur, Brian. 1994. *Increasing Returns and Path Dependence in the Economy*. Ann Arbor, MI: University of Michigan Press.

Basu, Kaushik. 2000. *Prelude to Political Economy: A Study of the Social and Political Foundations of Economics*. Oxford, UK: Oxford University Press.

Baumgartner, Frank R., and Bryan D. Jones. 1993. *Agendas and Instability in American Politics*. Chicago: University of Chicago Press.

Beinhocker, Eric. 2006. *The Origins of Wealth: Evolution, Complexity, and the Radical Remaking of Economics*. Boston: Harvard Business School Press.

Bowles, Samuel. 2004. *Microeconomics: Behavior, Institutions and Evolution*. Princeton: Princeton University Press.

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Epstein, Joshua. 2006. *Generative Social Science: Studies in Agent-Based Computational Modeling*. Princeton: Princeton University Press.

Ferguson, William D. 2011. Curriculum for the Twenty-First Century: Recent Advances in Economic Theory and Undergraduate Economics. *Journal of Economic Education* 42(1): 31–50.

Ferguson, William D. 2013. *Collective Action and Exchange: A Game-Theoretic Approach to Contemporary Political Economy*. Stanford: Stanford University Press.

Greif, Avner. 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge: Cambridge University Press.

Jackson, Matthew O. 2008. *Social and Economic Networks*. Princeton: Princeton University Press.

Kingdon, John W. 2003. *Agendas, Alternatives, and Public Policies*, 2nd ed. New York: Longman.

Rossi, Peter H., Mark W. Lipsey, and Howard E. Freeman. 2004. *Evaluation: A Systematic Approach*, 7th ed. Thousand Oaks, CA: Sage Publications.

Sabatier, Paul A. (ed.). 2007. *Theories of the Policy Process*, Second ed. Boulder, CO: Westview Press.

Watts, Duncan. 2002. A Simple Model of Global Cascades on Random Networks. *PNAS* 99(9): 5766–5771.

Weimer, D.L., and A.R. Vining. 1991. *Policy Analysis: Concepts and Practice*, 2nd ed. Englewood Cliffs, NJ: Prentice Hall.

[1] Albert Einstein said “God does not play dice”.

[2] On complexity economics, see Arthur (1994) and Beinhocker (2006); on networks, see Jackson (2008); on agent-based modeling see Epstein (2006).

[3] For modeling approaches see Basu (2000), Bowles (2004) and Ferguson (2013). On relations to economic curricula, see Ferguson (2011).

[4] For example, the essays in Sabatier (2007), Baumgartner and Jones (1993) on punctuated equilibria in policymaking; Kingdon’s (2003) concept of policy emergence.

[5] While economists often avoid power (hard to formalize), complexity invites its consideration. Modern game theory provides modeling tools (see Basu 2000, chapter 6; Ferguson 2013, chapter 4).

[6] See Rossi et al. (2004); includes a chapter on social context.

[7] Adjustments for context depend on directions of inquiry.

[8] See Greif (2006) on self-reinforcing and self-undermining equilibria. See Watts (2002) on information cascades in networks and Ferguson (2013, chapters 11 and 12) on relations to punctuated equilibria and policy.