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It's Complicated

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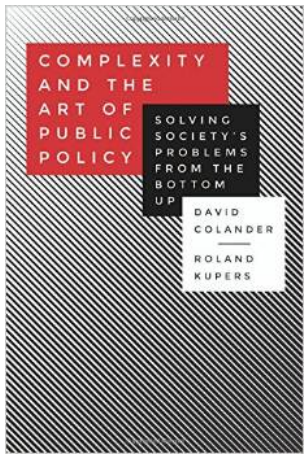
Adam Smith and John Stuart Mill had it. Leon Walras didn't. John Maynard Keynes had it. Abba Lerner, Milton Friedman, and George Stigler didn't. Brian Arthur has it. Paul Krugman doesn't.



Those are evaluations made by David Colander and Roland Kupers of famous economists' ability to appreciate complexity. Colander and Kupers have written *Complexity and the Art of Public Policy: Solving Society's Problems from the Bottom Up*,[1] a book that I found to be highly ambitious, always stimulating, and often frustrating.

The ambition can be seen in what I perceive as the major goals of the book:

> 1. To shift the training and research of economists to focus less on conventional mathematical modeling and more on the methods of complexity as well as on trans-disciplinary education, meaning the inclusion of political science, sociology, psychology, and humanistic disciplines.
>
> 2. To move the policy debate away from the ideological war between those who favor more government and those who favor less government. Instead, the authors seek to reframe the issue as one in which government does not seek to impose solutions but instead works more to foster solutions to economic problems. The authors speak of "bottom-up solutions" and "laissez-faire activism."
>
> 3. To offer novel policy proposals, including having the government encourage "for-benefit" corporations and substitute user fees for taxes.[2]

In order to accomplish these goals, the authors seek to dethrone neoclassical economics. In terms of a metaphor that Colander articulated at a conference, neoclassical economics represents a high mountain peak in terms of insights into social phenomena. However, there is a higher peak to be found, and to reach that summit economists must first climb down from neoclassical economics and scale the peak of complexity economics.

As I see it, the complexity paradigm differs from the neoclassical paradigm in two important ways. First, the complexity paradigm treats as important the many feedback mechanisms that exist in the economy. James Manzi terms this causal density.[3] As Colander and Kupers put it:

> The more interconnected parts to a system, the more likely it is that the system is best analyzed as a complex system. (Colander and Kupers, page 46)

On page 14, they explain,

For more on these topics, see the EconTalk podcast episode **Manzi on Knowledge, Policy, and Uncontrolled**, **Game Theory,** by Avinash Dixit and Barry Nalebuff, in the *Concise Encyclopedia of Economics*, and **"The Use of Knowledge in Society,"** by **Friedrich Hayek**, at the Library of Economics and Liberty.

> A tropical forest is a complex system, but a suburban garden plot is not. The reason is that the former is deeply interconnected, and it is the interconnected links that define it. A tropical forest will likely collapse if you disturb the natural balance too much, while in a suburban garden you can generally safely remove entire flower beds without affecting its overall health and integrity.

In neoclassical economics, in order to isolate the effect of a policy change, the phenomena of cultural norms, historically-given habits, government structure, individual information sets, and social institutions are all exogenously given. In the complexity paradigm, there are bidirectional causal arrows connecting each of these phenomena to one another.

Mainstream economists liberally employ the phrase *ceteris paribus*, or "other things equal." In the complexity paradigm, other things are never equal. Instead, there are many feedback mechanisms at work, making policy outcomes less predictable. Colander and Kupers write,

> In the complexity frame, scientific models provide a vision for policy, not an answer for policy. So how does one arrive at a policy? By touch, feel, and intuition. (page 16)

Neoclassical economists have long recognized that when other things are *not* equal, models' results can be overturned. This is known as the theory of the second best, which was articulated by Richard Lipsey and Kelvin Lancaster in 1956. Whereas mainstream economists honor this theory with lip service only and then proceed to make model-based policy recommendations, Colander and Kupers believe that the simplification of "other things equal" can and should be replaced by an appreciation for the complexity of the interconnected real world.

The other major departure from neoclassical economics is in the treatment of multiple equilibria. In mainstream economics, this phenomenon is viewed as a mathematically difficult curiosity. The complexity frame treats multiple equilibria as important in the real world. Colander and Kupers argue that complexity economics offers some mathematical tools for dealing with multiple equilibria. If nothing else, it offers alternative jargon, replacing "multiple equilibria" with "basins of attraction."

I think that Colander's "twin peaks" metaphor might well be adapted for use in describing multiple equilibria. One peak represents the current configuration of production and trade. Another peak may represent a different configuration, perhaps in response to new technology or changes in the international situation, or perhaps arising from different history and social norms.

Perhaps a macroeconomic slump reflects the economy climbing down from one peak before ascending another. Colander and Kupers write,

> ... in our interpretation of [Keynes'] work, he had what would today be seen as a complexity vision of the aggregate economy, in which there is not a single equilibrium, but many. In such a multiple-equilibrium world macro results were determined by dynamic turbulence and interactions of individuals, not by people's rational decisions. In modeling this turbulence, reductionism would not suffice, and there could be macro laws that were not grounded in micro relationships... Keynes' macroeconomic laws described emergent effects that had no foundation in microeconomics. (page 92)

Colander and Kupers say that the neoclassical "synthesis" that emerged after **Keynes** was different.

> ... whereas Keynes's model could be seen as having complexity foundations, the neo-Keynesian model could not. It was essentially a

> general equilibrium Walrasian model with fixed wages and a single equilibrium. The multiple equilibria and dynamic aspects of Keynes's insights—the complexity insights—were lost. (page 97)

On an historical note, I would point out that in the 1960s Robert Clower and Axel Leijonhufvud were champions of a view similar to Keynes' as describing an economy out of equilibrium. However, their interpretation came to be superseded (unfortunately, in my opinion) by the "rational expectations revolution."

In short, neoclassical economics is guilty of two major sins, according to Colander and Kupers. One sin is ignoring most of the important causal chains and feedback mechanisms in the economy, and instead using the hand-waving dodge of "other things equal." The other sin is looking at behavior only in the neighborhood of equilibrium, when what should most concern policy makers in a world with multiple equilibria is the process of coaxing the economy from one mountain peak to another. The modeling tools that are available to such sinners enable them to make policy recommendations that appear to be precise, but in fact are not robust.

Colander and Kupers blame the neoclassical paradigm for the polarized debate between what they call advocates of government control on the one hand, and market fundamentalists on the other. They treat **Abba Lerner** as the progenitor of the former, and they treat **Milton Friedman** and **George Stigler** as the progenitors of the latter.

I have a number of quibbles with this intellectual history, but I have one over-riding question. That is, what explains why economists did not all end up in the same camp? Colander and Kupers only hint at an answer. They suggest that Friedman and Stigler took more seriously the ideas of **Ronald Coase**, who argued that externalities could in principle be dealt with through negotiation. If you thought that Coasean bargaining costs were high (imagine trying to arrange water and sewer policies in a big city through negotiation among all of the inhabitants), then you might prefer to have the government dictate a solution.

But is the difference between a government controller and a market fundamentalist nothing more than that the former believes that Coasean bargaining costs are high and the latter believes that such costs are low? Even so, what would explain a difference in the estimate of bargaining costs?

My own view is that economists end up in different camps more on the basis of their beliefs about government *failure*. If you see government failure as inevitable, because of public-choice problems and Hayek's knowledge problem, then you are less inclined to favor government intervention. If you believe that public officials have (or can be made to have) sufficient expertise and moral will to solve these problems, then you are more inclined to favor government intervention.

In the neoclassical paradigm, government intervenes by changing incentives. In the complexity paradigm, policy makers should think in terms of the entire structure of a problem, including historical forces, cultural norms, and institutional mechanisms. Colander and Kupers even suggest having government try to alter people's tastes. For example, they write,

> ... if people have climate-friendly tastes, then there is little cost to dealing with the problem of climate change. (page 191)

I wish they had done more to spell out this idea. In particular, I was unclear how much of our taste for the comforts of the industrial age must be altered to achieve their preferred outcome.

Apart from various minor quibbles, I had two major frustrations with

Complexity. One frustration was with the lack of examples that clearly demonstrated the value of the mathematical and computational tools of complexity analysis. The second frustration was with their failure to stick to a single concept of government.

A common response to complaints about neoclassical economics and mathematical representations of economic concepts is that "it takes a model to beat a model." To mainstream economists, objections to the assumptions and methods of conventional modeling are not sufficient to motivate a methodological change. In what ways do other methods yield more powerful results? As the authors point out, the complexity paradigm has been around since the mid-1980s. My sense is that it has failed to capture any significant market share in the profession. I see no sign that a John Bates Clark Medal or a Nobel Prize is going to be awarded in the foreseeable future to a complexity theorist.[4]

Colander and Kupers frequently hint that the mathematical tools of complexity theory can provide new insights. But just as frequently, they back off and say that complexity theory only offers reasons to question the robustness of neoclassical answers.

My biggest frustration with *Complexity* was its varied treatment of government. It seems to me that taking causal density seriously means thinking of government as itself a complex set of people, institutions, formal laws, and informal norms, with bidirectional causal arrows running among all of them, as well as to markets and other social institutions.

Indeed there are points in the book where the authors articulate this sort of view. For example, they write,

> Government is not a single entity that is out to do harm or good. It is a set of institutions through which individuals work to achieve certain ends. (page 238)

However, earlier on *the very same page*, they had written that government,

> ... needs to be powerful enough to accept that its role is to reflect the collective will of the people, not to further its own interests as an agent.

Does this sentence not treat government as a single entity that is out to do harm or good?

In addition to "the collective will of the people," the authors invoke "society" or "social goals" or "the common good" as affecting government behavior. They go so far as to say that,

> ... there are multiple social societies—for example, the reasoned social society and the impulsive social society—and they have different preferences. (page 185)

They also write,

> Government is one of the important organizations that creative people have set up through which rules are established and maintained. It is both the referee, and the rules committee... Internationally, we have no global government; instead we have a wide variety of agreements that people have negotiated through governments to allow international coordination to occur. (page 34)

The metaphor of a referee or rules committee is an interesting one. But how is it that we need a government referee within a nation state, yet internationally we seem to be able to get along with no referee? For me, the Internet represents an even more striking example of governance

without government. Communications protocols and software standards are set by ad hoc task forces of engineers. Once a solution has been adopted, a task force will disband or become dormant. Why doesn't government work that way?

In another place, they write,

> ... in the complexity frame parenting is the equivalent of public policy at the family level. (page 55)

I view the parenting metaphor for government as highly problematic. Children clearly lack the knowledge and maturity to get through life unaided by adults. Are we to believe that the knowledge and maturity gap is similar between adult citizens and government officials?

Even though I voice these criticisms, and even though I think they are important, I strongly recommend *Complexity*. It is by far the most stimulating nonfiction book I have read this year, and it provides many interesting insights and ideas that I have not dealt with in this review.

Footnotes

1. Colander, David and Kupers, Roland. *Complexity and the Art of Public Policy: Solving Society's Problems from the Bottom Up.* Princeton University Press, 2014.
2. On page 240, they write "[The U.S. government] could have only given away rights to the land for one hundred years, and still have achieved the same goal of promoting economic growth. Had it done so, it would now have hundreds of billions of dollars of land rent coming in." This reminded me of Spencer MacCallum's *The Art of Community*, in which government acts as a landlord.
3. See my review of James Manzi's book, *Uncontrolled*. Available online at: **https://www.nationalreview.com/nrd/articles/299755/great-experiments**.
4. Some of Thomas Schelling's work, such as his agent-based model of neighborhood segregation, fits with complexity methodology, but it was for applied game theory that he earned his Nobel Prize.

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*Arnold Kling has a Ph.D. in economics from the Massachusetts Institute of Technology. He is the author of five books, including *Crisis of Abundance: Rethinking How We Pay for Health Care*; *Invisible Wealth: The Hidden Story of How Markets Work*; and *Unchecked and Unbalanced: How the Discrepancy Between Knowledge and Power Caused the Financial Crisis and Threatens Democracy*. He contributed to EconLog from January 2003 through August 2012.

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