Outline-The Role of Computation in the Social Sciences:

1. Computational tools should be used to model reality similar to the way a map models the real world by abstracting away details that are not relevant to the problem to be solved.
2. Many of the neoclassical computational methods go too far by abstracting away reality to the point that their models are no longer useful in modeling the real world.
3. Markets are complex systems and we can gain insights from the way physicists make models of complex nuclear reactions.
4. Bayesian statistics is more adept at modeling the real world because it attempts to use current knowledge to predict the future without forcing the data to fit a normal distribution. If market prices actually occurred on a normal distribution, events like Black Monday and Black Thursday would only occur every 40 million years or so. Instead, they seem to occur every decade or two. One of the most important jobs of economists is to predict when disastrous events will occur in markets, and to understand the incentives of the individual players in the market well enough to know what steps should be taken to avert such crises.
5. The Black-Scholes model is only as accurate as the computation of future volatility (see source)
6. The general equilibrium model has some fatal flaws (-Road to ruin pg.3377-3398):
   1. At the root of the general equilibrium model is rational behavior. People do not behave predictably. They are either part of the crowd or the anti-crowd or they are random. “Economic systems are not in equilibrium; they are complex, dynamic, and subject to critical state chaos and collapse.”
   2. Fallacy of composition. The assumption that local equilibria can be aggregated into a larger equilibrium called the economy is not true (also see Hayek about statistical aggregates).
   3. Fatal flaw: “The degree distribution of market price movements is assumed to be shaped in a bell curve, or so-called normal distribution.” We should use the alternative power curve system because it allows for a complex system with an “open-ended capacity for extreme events.”

What Should Economists Do?

The role of economists should be to prevent, or to at least lessen, the disastrous effects of market crashes on the economy. If there is any value at all in studying economic theory, it is in applying economic principles to markets in the real world. The most perfect computational models do us no good if the world is falling to pieces around us. Economics should not be so much about equilibrium, but about catallactics. We need models that help us explain markets and prices as they actually are rather than as mathematics says they should be. By studying the exchanges that lead to the emergence of market prices, we can come to understand the incentives that are driving the exchange.

The only thing that economists can actually do to change markets is to manipulate the incentives in the marketplace by changing laws or fiscal policies. The Federal Reserve employs over 300 individuals with Ph.D.’s in economics, and yet they still cannot prevent major financial crises from occurring. If all we do is build complex mathematical models that do little to explain the real world, then economics as a social science provides little value. Some of the current methodologies in neoclassical economics are preventing economists from reaching their potential.