Robert Axtell

Robert Axtell is the Professor and Chair, George Mason University, Krasnow Institute for Advanced Study, Department of Computational Social Science; External Professor, Santa Fe Institute

Dr. Axtell works at the intersection of economics, behavioral game theory, and multi-agent systems computer science. His most recent research attempts to emerge a macroeconomy from tens of millions of interacting agents. He is Department Chair of the new Department of Computational Social Science at George Mason University (Fairfax, Virginia, USA). He teaches courses on agent-based modeling, mathematical modeling, and game theory. His research has been published in "Science," "Proceedings of the National Academy of Sciences USA," and leading field journals. Popular accounts have appeared in newspapers, magazines, books, online, on the radio and in museums. His is the developer of Sugarscape, an early attempt to do social science with multi-agent systems, andco-author of "Growing Artificial Societies: Social Science from the Bottom Up" (MIT Press 1996). Previously, he was a Senior Fellow at the Brookings Institution (Washington, D.C. USA) and a founding member of the Center on Social and Economic Dynamics there. He holds an interdisciplinary Ph.D. from Carnegie Mellon University (Pittsburgh, USA).

~~~~~~

Intertemporal Behavior: How People Discount the Future--Experimental Data and Formal Representation

A mathematical formalism is developed for the existence of unique invariants associated with wide classes of observed discounting behavior. These invariants are ‘exponential discount rate spectra,’ derived from the theory of completely monotone functions. Exponential discounting, the empirically important case of hyperbolic discounting, and so-called sub-additive discounting are each special cases of the general theory. This formalism is interpreted at both the individual and social levels. Almost every discount rate spectrum yields a discount function that is ‘hyperbolic’ with respect to some exponential. Such hyperbolic discount functions may not be integrable, and the implications of non-integrability for intertemporal valuation are assessed. In general, non-stationary spectra lead to discount functions that are not completely monotone. The same is true of discount rate spectra that are not proper measures. This formalism unifies theories of non-constant discounting, declining discount rates, hyperbolic discounting, ‘gamma’ discounting, and related notions.
~~~~~~