Discussion of

Information Acquisition, Efficiency, and Non-Fundamental Volatility

by Hebert and La’O
The Question

Considers conditions on information cost functions that guarantee

• the existence of equilibria that only depend only on payoffs

• that equilibrium is efficient.
The Answer

Definitive Answer:

• Distinct conditions on cost functions
• Very interesting conditions per se: what do transformations of the state space do to learning costs
• Introduce partial invariance, partial monotonicity
• Shannon is remarkable in satisfying both ++
• Cannot improve on their work or delivery

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The Follow-Up Question

• Friendly amendment: attention cost IS a payoff
• No less fundamental than utility or technology
• Learning aids have real impact (framing)
• What about positive effects that relate to the shape of learning costs per se?
• Where to look for macro evidence for quantitative calibration purposes?

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How Big a Deal Are Costs of Attention?

Personal Perspective:
• Most exciting “new” branch of economic and psychological theory in my academic lifetime
  – Roots in psych. 175+ years (Weber-Fechner)
  – Roots in econ. 75+ years (Hayek)
  – Marschak, Arrow highlighted gap
  – Sims initiated modern era

• Trunk of the social scientific tree
How Big a Deal Is it Anyway?

Why So Important?

• Deeply contemporary (attention scarce)

• Implications obvious in behavior
  – Needle-Haystack?
  – 100% on all tests?
  – Applied microeconomics 100 case studies of mistakes in Top 5 (“facts”)

• Missing primitives for comprehension
Convergent Evolution

• Many researchers found gap for own reasons
  – Mine - Revealed Preference
  – Anxiety (with Leahy) hard to operationalize
  – Bigger issue: what reveals private information, asymmetric information, out of equilibrium strategy?

• Block and Marschak proposal:
  – Imperfect information and utility confounded in standard choice data, even stochastic
  – So further enrich data

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How Big a Deal Is it Anyway?

• “State dependent stochastic choice” (SDSC) favorite attention revealing data set
  – Based in psychometrics
  – Actual quality
  – Actual tax rate
  – RP Suited: with Daniel Martin, Bayesian Expected Utility maximizer iff No Improving Action Switches
  – With Mark Dean, rational inattention need also No Improving Attention Cycles
How Big a Deal Is it Anyway?

- Looked for implementable special cases..
- Search is a clever cheat and hard to test and clunky (fully understand some options?)
- Buy a normal signal: more/less not what
- Shannon/Sims advances: shape learning precisely to balance utility against cost
- Hybrid of utility and production theory
- Surprised at beauty, simplicity (e.g. Matejka and Mackay weighted logit), and richness (consideration sets with Dean and Leahy)
How Big a Deal Is it Anyway?

• With Dean and Leahy, “Characterizing and Generalizing”: revealed preference approach
• Start with SDSC “rationalizable” with “Posterior Separable” cost function (Hebert and La’O introduced)
• Allows dependence on prior, etc.
Pulling Back on the Literature

• A1: Locally Invariant Posteriors (sequential sampling rationale Hebert and Woodford)
• A2: Invariance Under Compression (ignore payoff irrelevant factors)
• Theorem 1: A1 iff Uniformly PS
• Theorem 2: A2 iff Invariant PS (thx. To referee)
• Theorem 3: A1+A2 iff Shannon
• Proofs: Easier said than done

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Domain Matters

• Hebert and La’O new classes for equilibrium properties
  – Invariance and (related) monotonicity on sub-domains of cost function
• Hidden key to new literature is domain of the cost function
  – In equilibrium models, learn about features of others learning (average actions in Hebert-La’O)
• Bigger picture on domain: Blackwell experiments, SDSC, Bayes’ consistent distributions of posteriors all give different and important insights
Barriers to Progress

• Field deeply rooted and work is fresh but progress since Hayek relatively slow

• Many microeconomic theorists and behavioral economists reluctant
  – Did costs of learning already
  – Incomprehension implies irrationality
Barriers to Progress

• Majority of applied microeconomists:
  – Theory so yesterday
  – Mostly Harmless, RCTs, and Machine Learning will take over

• Ignore it and it may go away
  – Possible, unfortunately
In My Ideal World

• Path forward in macro/finance
  – Theory a la Hebert and La’O will uncover properties of learning costs and how they DO matter for equilibrium outcomes
  – We will identify properties of data that reveal these as valid approximations
  – We will learn to quantify/calibrate using microeconomic studies
In My Ideal World

• There will be dramatic and related progress in:
  – Revealed Costs and Revealed Comprehension in Lab and Field Studies (e.g. Morrison and Taubinsky)
  – Games and shape of learning: (e.g. Denti)
  – Models of memory and expectations formation (e.g. Woodford, Malmendier and Nagel, Wachter and Kahane)
  – New applied field: inattentive survey responses (e.g. Enke and Graeber)
  – Information Design (Kamenica and Gentzkow)
In My Ideal World

• The end of the beginning of information revolution not the beginning of the end
  – Attention ultimate scarce resource, key to income, utility, etc.
  – Long run importance on level of standard production function and utility theory
  – Theories operational by design
  – Seamlessly integrated into applied work
  – Linking up distinct fields of social science

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Bibliography