Modeling with Behavioral Consumers: New Evidence, New Tools

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Jonathan Zinman*

Dartmouth College**, IPA, NBER, etc.

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** Used to go without saying, but alas… I do not speak for Dartmouth, and the Dartmouth Administration definitely does not speak for me

Plan for today

Drawing mostly on a big new project with Stango and Yoong…

1. *Why* important to take behavioral biases in consumer decision making seriously
   - Do behavioral factors matter, in the wild-- repeat play, high stakes, etc.?

2. *How* to do so
   - E.g., what should the “Behavioral” in a (Behavioral IO) model look like?

Topical motivation: From payday…

Topical motivation: *Say we want to evaluate a policy for the payday loan market*

- Or better yet, conduct welfare analysis to diagnose whether and how intervention needed in the first place

Q1. Should we consider behavioral factors?

- Many behavioral factors *could* influence decision making, and in turn lender and intermediary strategies in equilibrium
- Are behavioral factors important enough to consider?
- (Which ones?)
    - present-biased discounting; over-optimism and its sources; loss aversion; gambler's fallacies; exponential growth bias, etc.?

Q1. Should we consider behavioral factors? Yes

For the skeptics:

- Behavioral biases are *not* anomalous
  - Closer to ubiquitous (Shiller and Thaler; Stango, Yoong, and Zinman 2017a/b)
- Their influence does *not* disappear as stakes rise
  - Linked to consequential decisions (DellaVigna 2009; SYZ 2017a/b)
- Consumers will *not* necessarily learn to deal with their biases
  - Learning slow, even glacial (Ali QJE; Rabin and co-authors <-> Schwartzstein)
- Delegation/intermediation does *not* necessarily neutralize biases
  - (Panel this AM; Inderst and co-authors; mortgage steering literature)

Q1. Should we consider behavioral factors? Yes

For the believers:

- Intuitive policy approaches can make things worse
  - Competitive responses, limited enforcement, etc.
  - (Stango and Zinman 2011 RFS; Zinman 2014 JLS; Grubb & co-authors)

Broader motivation: From payday to *every* day

Q2. How should we model behavioral consumers?

- Model approach and specification
- *How do we build workhorse behavioral models?*
  - My last four slides (and next four papers…)
  - But first…

Why and how deal with behavioral consumers?
The Multiple Behavioral Factors Project (SYZ 2017 a/b/…)

- Collect data on *multiple* behavioral factors (17-ish), per person, in a large representative sample (RAND's American Life Panel)
  - Time-inconsistent discounting, loss aversion, Exponential Growth Bias, over-confidence (3 varieties), limited prospective memory, Gambler's Fallacies, etc.
- Using "direct elicitation"
  - Analogy to intelligence and personality testing
  - We streamline standard lab methods to lower costs
- In tandem with behavioral factor data, also collect data on
  - Standard/classical decision factors: cognitive skills, classical preferences, demographics (e.g., life-cycle factors)
  - Choices and outcomes: household finance; others

The Multiple Behavioral Factors Project: What we deliver

New tools for *measuring* behavioral influences on decision making:

- Low-cost elicitation methods
- Measurement error corrections
- Empirical summary statistics

New evidence on key empirical questions re: behavioral biases. They are:

- Quite prevalent & heterogeneous across consumers
- Correlated with each other, within consumer
- Statistically as well as conceptually distinct from classical factors
- Correlated with real-world decisions/outcomes, conditional on classical factors

New evidence re: *how* to model behavioral consumers

Approach 1. Silo: One bias at a time.

- Criticized for creating proliferation (e.g., Fudenberg 2006)
- But… valid and useful, *if* biases are separable
  - E.g., say I have reason to believe over-optimism about repayment is important feature of payday borrower decision making
  - Can I ignore any influence of present-bias? Other biases?
- Are behavioral biases separable? Little empirical evidence… until now
- Findings in SYZ (2017a) suggest yes
  - Single behavioral factors are conditionally correlated with financial decisions and outcomes, in the pattern predicted by silo theories
  - Conditioning on other biases does not change the results!

New evidence re: *how* to model behavioral consumers

Approach 2. Reduced-form behavioral sufficient statistics

- In these models “experienced utility” ≠ “decision utility”, without specifying how this happens; e.g., silent about which behavioral factor(s) matter
  - An “emergent” vs. a “fundamental” model
- Powerful, portable (Chetty ARE and AER Ely; Allcott & Taubinsky AER)
  - Not yet used in Behavioral IO (?)
- Relies on assumptions that had yet to be (in)validated empirically
- Findings in SYZ (2017b) encouraging, for the most part
  - Positive within-consumer correlation among biases? Yes.
  - Consumer-level bias: we construct sufficient stats by aggregating across biases, within-consumer
    - Nonnegative, positive for some, and not mean-zero in the aggregate? Yes.
    - Conditionally correlated with outcomes? Yes.
  - But… cross-person heterogeneity in behavioral summary stats complicates identification of the average marginal bias distribution that is key for welfare analysis

New evidence re:
how to model behavioral consumers

Approach 3. Grand unification of behavioral factors

- Is there something fundamental about human decision making that produces many/all behavioral biases, and their links to real decisions?
- Not crazy to think this could be the case
    - Countless cognitive skills -> "G" -> "Intelligence"
    - Countless descriptors of human traits -> "Big Five" personality traits
    - SYZ (2017b): Behavioral biases are indeed correlated within-person (also Dean and Ortoleva)
    - SYZ (2017b): Behavioral biases do seem to have a common factor underlying them
- But… glass may be half-empty
    - So far SYZ (2017b) finding that behavioral common factor has approx zero power (predictive, fit) for outcomes, once you condition on everything else (especially cognitive skills)
    - I.e. more idiosyncratic variation in behavioral biases may be what's important and distinct from classical factor
    - But still more work to do with Structural Equation Modeling, measurement error corrections

Going forward: Evidence-based modeling

- Consider a setting *s* where a researcher or policymaker has priors about behavioral bias(es) *B* that affect outcomes *Y* and welfare
- SYZ provides tools to cheaply measure *B* on a representative sample from *s*
- Use the empirical distribution of *B*, and statistical relationships between *B* and *Y,* to inform whether to model *B* using the:
  - Approach 1. Behavioral silo(s)
  - Approach 2. Reduced-form behavioral sufficient statistic
  - (Approach 3. Grand unification not ready yet. SYZ and other teams working towards this….)
- Allcott, Taubinsky, and I trying to do this in various markets
- I encourage others to do the same!