Is Behavioral Economics Doomed?

Amsterdam TI Conference
September 23, 2010
David K. Levine
Theory That Works: Voting

Levine and Palfrey [2007]
**Theory that Works: Competitive Equilibrium**

Plott and Smith [1978]
**Theory That Works? Ultimatum Bargaining**

<table>
<thead>
<tr>
<th>x</th>
<th>Offers</th>
<th>Rejection Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2.00</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>$3.25</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>$4.00</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td>$4.25</td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td>$4.50</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>$4.75</td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td>$5.00</td>
<td>13</td>
<td>0%</td>
</tr>
</tbody>
</table>

US $10.00 stake games, round 10

Roth, Prasnikar, Okuno-Fujiwara, Zamir [1991]
**What the Theory Tells us: Losses In Ultimatum**

Out of $10

<table>
<thead>
<tr>
<th>Losses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowing</td>
<td>$0.34</td>
</tr>
<tr>
<td>Unknowing</td>
<td>$0.99</td>
</tr>
</tbody>
</table>

Fudenberg and Levine [1997]

➢ Learning and short-term errors are an important part of mainstream economics
Self-Confirming Equilibrium

Centipede

\[
\begin{align*}
1 & \rightarrow P_1^{[0.92]} \rightarrow 2 \rightarrow P_2^{[0.51]} \rightarrow 1 \rightarrow P_3^{[0.25]} \rightarrow 2 \rightarrow P_4^{[0.18]} (\$6.40, \$1.60) \\
T_1^{[0.08]} & \downarrow \quad T_2^{[0.49]} & \downarrow \quad T_3^{[0.75]} & \downarrow \quad T_4^{[0.82]} \\
(\$0.40, \$0.10) & \downarrow \quad (\$0.20, \$0.80) & \downarrow \quad (\$1.60, \$0.40) & \downarrow (\$0.80, \$3.20)
\end{align*}
\]
Equilibrium: The Weak versus the Strong

Approximate or $\varepsilon$-equilibrium

$s_i$ strategy choice; $\mu_i$ beliefs; $u_i$ utility

$$u_i(s_i \mid \mu_i) + \varepsilon \geq u_i(s'_i \mid \mu_i)$$

equilibrium: beliefs are correct
Individual Play in Voting
Quantal Response Equilibria

$\sigma_i$ mixed strategy or probability of play

$\lambda_i > 0$ parameter

$$p_i(s_i) = \exp(\lambda_i u_i(s_i, \sigma_{-i}))$$

$$\sigma_i(s_i) = \frac{p_i(s_i)}{\sum_{s_i'} p_i(s_i')}$$

Games with Strong Equilibria

- voting

- competitive equilibrium
Quantal Response Application: Goeree and Holt [2001]
Has Traditional Theory Been Proven Useless?

The Fire Escape Game aka the Prisoner’s Dilemma

<table>
<thead>
<tr>
<th></th>
<th>Everyone else</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>You</strong></td>
<td>orderly</td>
</tr>
<tr>
<td><strong>orderly</strong></td>
<td>9</td>
</tr>
<tr>
<td><strong>rush</strong></td>
<td>10</td>
</tr>
</tbody>
</table>

no need to model sick feeling of panic
Market Crashes
Lasse Pedersen: “quant event” of August 3-14 2007

minute by minute real market price and computed from pure rational expectations
Is it Mainstream

1979 in the *Journal of Money, Credit and Banking*: “A Model of Balance-of-Payments”

under perfect foresight crises are ubiquitous when speculators swoop in and sell short

deficient: crises are perfectly foreseen so cannot lead to catastrophic drops in prices

long-since remedied: 2,354 follow-on papers, including the beautiful 1983 Salant paper with uncertainty and rational expectations
Psychology versus Economics

- psychologists interested in individual behavior
- economists interested in group interactions
- psychologists focused on human dysfunction
  - the bulk of psychologists are in clinical practices
- most people quite functional most of the time
  - so economists focus on people who are “rational”
- balancing of portfolios by mutual fund managers not an obvious candidate for a theory of human dysfunction
Where Does this Leave Behavioral Economics?

- Real versus imaginary paradoxes
- Likely versus unlikely explanations
- Is it more likely that people are confused about things they know much about or little about?
- Broad versus narrow theories: can’t have a different set of parameters for every instance
Procrastinating at the Health Club

- people who choose membership pay more than $17, even though a $10-per-visit fee is also available
- agents overestimate … delay contract cancellation whenever renewal is automatic ($70 per month)

DellaVigna, Malmendier 200

Hypothesis 1: people think incorrectly that they will cancel tomorrow

Hypothesis 2: people think it will be an expensive hassle to cancel; wait for “hassle” cost to be low
**Prospect Theory**

Suppose that $p_i$ is the chance of winning one of two prizes $x_i \geq 0$

$$U = \sum_i \frac{.846 p_i^{.414}}{.846 p_i^{.414} + (1 - p_i)^{.414}} x_i^{1.056}$$

Bruhin, Fehr-Duda, and Epper [2007]

Would you rather have:

A. $5,000 for sure

B. a 50-50 coin-flip between $9,700 dollars and nothing

***and*** you don’t exhibit the Allais paradox
The Becker Marschak DeGroot Elicitation Procedure

- Willingness to pay versus willingness to accept

Zeiler and Plott 2004
**Anchoring**

Is anchoring greater or less for your risk aversion for which you know much, or bidding on goods about which you know little?

Based on Ariely, Lowenstein and Prelec (2003)

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Academic Planner</th>
<th>Cordless Keyboard</th>
<th>Financial Calculator</th>
<th>Design Book</th>
<th>Milk Chocolates</th>
<th>Cordless Mouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19</td>
<td>7</td>
<td>38.85</td>
<td>10.23</td>
<td>11.30</td>
<td>5.62</td>
<td>22.07</td>
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<tr>
<td>20-39</td>
<td>12.44</td>
<td>50.19</td>
<td>20.37</td>
<td>14.75</td>
<td>17.88</td>
<td>42.88</td>
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<tr>
<td>40-59</td>
<td>11.50</td>
<td>51.94</td>
<td>20.94</td>
<td>18.12</td>
<td>8.47</td>
<td>24.56</td>
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<tr>
<td>60-79</td>
<td>10.05</td>
<td>38</td>
<td>18.78</td>
<td>16.5</td>
<td>7.47</td>
<td>19.95</td>
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<tr>
<td>80-99</td>
<td>7.64</td>
<td>47.28</td>
<td>31.92</td>
<td>15.57</td>
<td>7.36</td>
<td>26.85</td>
</tr>
<tr>
<td>All data</td>
<td>9.90</td>
<td>45.07</td>
<td>20.46</td>
<td>15.46</td>
<td>9.46</td>
<td>27.10</td>
</tr>
<tr>
<td>Correlations</td>
<td>-0.047</td>
<td>-0.022</td>
<td>0.207</td>
<td>0.134</td>
<td>-0.096</td>
<td>-0.108</td>
</tr>
<tr>
<td>p-value (1-tail)</td>
<td>&gt; 0.5</td>
<td>&gt; 0.5</td>
<td>0.034</td>
<td>0.12</td>
<td>&gt; 0.05</td>
<td>&gt; 0.5</td>
</tr>
</tbody>
</table>

willingness to accept (WTA) based on randomly assigned “anchors”
The Rabin Paradox

If you are indifferent between a 70% - 30% chance of
A: $40 and $32
B: $77 and $2
And your lifetime wealth is $860,000 then your coefficient of relative risk aversion is 27,950
If you are indifferent between holding stocks and bonds your coefficient of relative risk aversion is 8.84
➢ The reference point is real
Strengthening Economic Theory

Mainstream models
➢ learning
➢ habit formation
➢ consumer lock-in

Works in progress
➢ ambiguity aversion and the dishonest
➢ level-k thinking and one-off play
➢ interpersonal (social) preference
➢ menu choice and self-control
A Speculative Idea

- A virtual economy for model validation
- What do we do in the lab and the field anyway?
- What is needed?
- Theory of learning and preferences
- Validation inside and outside the laboratory