Written Exam Economics summer 2016

Foundations of Behavioural Economics

June 03, 2016

(3-hour closed book exam)

Sketch for solution

Note: The following illustrations are a sketch of how to solve the exam questions, rather than a full-fledged "solution manual". Some derivations of results are omitted for brevity and some responses only exemplify possible solutions to the questions (in both cases, further details can be found in the lecture notes of the respective sections).

Question 1:

During the course we talked about different types of social preferences. In particular, we focused on the theory of inequality aversion by Fehr and Schmidt (1999) and the theory of sequential reciprocity by Dufwenberg and Kirchsteiger (2004).

a) Please give a brief overview of the experimental evidence that has inspired the development of these two theories.

- *All points that should be included in the answer to this question can be found on slides in lectures 2 and 3 and the mandatory reading.*
- *Evidence regarding the dictator and ultimatum game should be mentioned as well as the evidence discussed in relation to the gift exchange game.*
- *Importantly the answer should discuss that the ultimatum game does not allow for any differentiation between reciprocity and inequality aversion as both can lead to similar predictions. Giving in the dictator game on the other hand cannot be explained by reciprocity.*

b) Consider the following strategic situation:
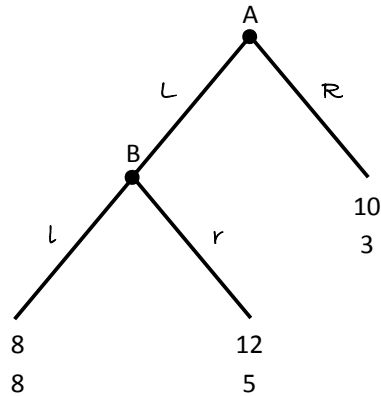
Assume player A and B are motivated by inequality aversion (Fehr and Schmidt 1999). For which values of α and β is (L , l) a subgame perfect equilibrium?

- *Player B can decide between getting 8 by playing l and getting 5 by playing r*
- *l does not imply any inequality at all. That is, both own payoff concerns as well as inequality aversion will imply that player B chooses l independent of his α and β.*
- *Knowing this player A has to decide between playing R giving him 10 and playing L giving him 8.*
- *He plays L instead of R if the following holds*

$$8 \geq 10 - \beta_A(10 - 3)$$

which holds if $\beta_A \geq 2/7$

c) Consider again the situation described in Part b), but now assume that player B and A are motivated by belief-dependent reciprocity (Dufwenberg and Kirchsteiger 2004). For which values of the sensitivity to reciprocity Y_A and Y_B is (L , r) a sequential reciprocity equilibrium?

- *Observation 1: there is no belief that player B can hold such that player A's choice L is perceived as unkind. In other words $\lambda_{BAB} \geq 0$ in the history in which he has to choose*
- *Specifically, let β be player B's belief about the likelihood which A put on him choosing l. Then,*

$$\lambda_{BAB} = \beta 8 + (1 - \beta)5 - \frac{1}{2}[3 + \beta 8 + (1 - \beta)5]$$

- *His (un)kindness to player A by choosing l and r are:*

$$\kappa_{BA}(l) = 8 - \frac{1}{2}[12 + 8] = -2$$

$$\kappa_{BA}(l) = 12 - \frac{1}{2}[12 + 8] = 2$$

Putting things together, player B chooses r over l if

$$8 + Y_{BA}(-2)\left(\beta 8 + (1-\beta)5 - \frac{1}{2}[3 + \beta 8 + (1-\beta)5]\right)$$

$$\leq 5 + Y_{BA}(2)(\beta 8 + (1-\beta)5 - \frac{1}{2}[3 + \beta 8 + (1-\beta)5])$$

- *In equilibrium with β = 0 this reduces to $\frac{3}{4} \leq Y_{BA}$*
- *Assume that this is the case, then player A chooses L for reciprocity and own payoff reasons independent of Y_{AB}*

Question 2:

a) What is the key difference between the Kőszegi-Rabin model of reference-dependent preferences and prospect theory?

- *Kőszegi-Rabin: Reference point is endogenous. Specifically, reference point is determined through (recently held) rational expectations of possible outcomes. To determine gain-loss utility, each outcome is compared to all other possible outcomes (weighted with the corresponding probability that these occur).*
- *Prospect Theory: reference point is exogenously given. Although expectations are discussed as source of reference points in PT, in most applications of PT the reference point is assumed to be the status quo.*
- *Examples: agent who expects a high wage increase, and gets positive but smaller wage increase (loss compared to expectation-based RP, gain compared to status-quo). Other examples can be constructed (e.g., using evaluation of lotteries).*

b) What are the main challenges in empirically testing the Kőszegi-Rabin model?
   - Discuss, in particular, which difficulties arise if one wants to test the validity of the model's assumptions regarding the reference point.
   - Give an example of a study that aims at testing the Kőszegi-Rabin model, and illustrate how this study solves the challenge.
   - What was the main result of the study?

- *Key challenge: expectations not observable, makes is difficult to measure expectation-based RP and identify its behavioral effects*
- *Key idea of study by Abeler et al.: exogenously manipulate rational expectations in experiment that uses payment scheme with probabilistic payments: subjects get fixed wage or performance-dependent payment, each with probability 50%. Fixed wage (and therefore rational earnings expectations) is exogenously varied across treatments. Find evidence consistent with K/R: on average, subjects with higher exogenously induced earnings expectations work harder.*

Question 3:

a) Time preferences are often measured using experiments that involve decisions between "sooner-smaller" and "later-larger" rewards. Discuss (at least) two major challenges that such experiments have to deal with:
  - Explain why these issues might distort the measurement of people's "true" time preferences.
  - Discuss how (some of) the problems can be addressed by appropriately adjusting the experimental setup and procedures.

- *Potential problems of experiments (see lecture notes for the specific distortions that might arise from the different challenges and for potential solutions):*
  - o *time preferences / utility defined over consumption levels (not money) at different points in time*
  - o *"framing" of elicitation method may affect results (e.g., time horizon between sooner and later, willingness to pay vs. willingness to wait, length of multiple price lists, etc.)*
  - o *Perceived risk and required trust in the experimenter may differ between sooner / later reward*
  - o *(differences in) participants' credit constraints might affect their responses*

b) Consider the following figure taken from Choi et al. (2004). What is depicted in the graph? Explain, in particular, the key difference between the "opt-in" and "opt-out" regime.
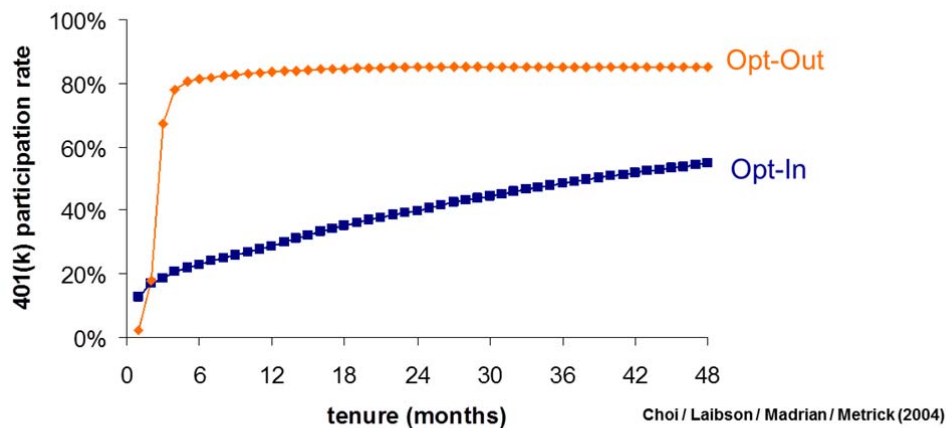
- *Graph depicts differences in participation rates in 401(k) retirement savings plans (y-axis) for employees with different levels of tenure (x-axis) at firms that apply different policies for savings-plan enrollment (orange vs. blue line).*
- *The "opt-in" and "opt-out" regime differ in the default applied to newly hired employees: employees in firms with "opt-in" policy have to actively enroll in the savings plan. Employees in firms with "opt-out" policy are automatically enrolled in the plan (by their employer), but can opt out if they do not want to use the 401(k) plan to save for retirement. Although the costs of opting in / out of the plan are very low in both regimes, differences in defaults result in strong differences in plan enrollment rates.*

c) Briefly sketch the most important additional effects of default specifications on savings behavior in 401(k) plans.

- *Default specification also have been shown to strongly affect individuals' savings rates and asset allocation (many people stick to the pre-determined default savings rate and savings products / portfolio allocation, respectively). Net effect of defaults on individuals' overall savings level is ambiguous.*

d) Are the findings from b) and c) consistent with exponential discounting? Explain which aspects of the decision environment and empirical findings make you confident that exponential discounting cannot account for the findings.

- *Transaction costs of opting in / out should be negligible relative to the amounts of money that are at stake. Depending on level of impatience, exponential discounters should enroll immediately or never, but at similar rates under Opt-in vs. opt-out default. Observed differences in asset allocation also hard to reconcile with exponential discounting.*

e) Can the findings be explained by quasi-hyperbolic discounting? Explain. How does the answer depend on whether you assume that quasi-hyperbolic discounters are sophisticated or naive?

- *Quasi-hyperbolic discounters are present-biased. Therefore have a tendency to seek immediate gratification and postpone immediate costs.*
- *Transaction costs of opting in vs. opting out are small, but occur immediately. This might yield a tendency of present-biased agents to (i) not enroll under opt-in default and (ii) stick to plan enrollment under opt-out.*
- *Naïve agent overestimates future self's willingness to bear transaction costs of actively opting in / out: thus sticks to plan under opt-out default, enrolls immediately or never under opt-in default (depending on level of present bias and impatience). This might explain differences in enrollment rates. Similar arguments for differences in savings rates and asset allocation.*
- *Sophisticated agent anticipates that future selves will have similar preferences for procrastinating active decisions, consequently more willing to take an active decision immediately. Behavior thus qualitatively similar to exponential discounter from part d) (and hard to reconcile with evidence from part b and c)*

f) Can you provide an alternative explanation (unrelated to time preferences) that is consistent with the findings described in part b) and c)? Explain.

- *Default specifications might be perceived as recommended action (people stick to default plan because they think employer knows better what is a good plan, savings rate, etc.)*
- *Limited attention and memory: people might oversee (or forget) the need / possibility to make a decision on savings plan (especially when they just started a new job),*
- *….*

Question 4:

Discuss whether experience with a decision situation eliminates deviations from "standard" Expected Utility Theory.

a) Describe an example in which deviations from Expected Utility Theory become less pronounced (or one where they do NOT become less pronounced) once people gain experience with the decision situation. How was the influence of experience tested in your example?

- *Possible examples: endowment-effect experiments with sports card traders by J. List, cab-driver studies on reference-dependence by Camerer et al., used-car auction study on limited attention and left-digit bias by Lacetera et al., …*
- *See slides from respective lectures for details on measurement of experience and testing strategy for different examples*

b) Discuss potential difficulties in measuring and causally identifying the impact of experience on behavior. How do different empirical approaches cope with these difficulties?

- *Main problem: experience is endogenous. This may lead to problems of sample selection and attrition, which make it difficult to disentangle experience effects from other mechanisms (e.g., less biased people select into professions, less successful players are eliminated from the market, etc.). In cross-sectional data, it is also hard to disentangle differences in experience from differences in motives (e.g., laymen vs. professional traders in the List paper). Some of the issues can be addressed in panel data (e.g. follow-up experiment in the card-trader paper to analyze how changes in experience level affects trading behavior). In lab experiments, it is somewhat easier to control for these issue, but repetition of games might change set of equilibria (e.g., observing stronger evidence for "fair" behavior in repeated game does not tell us that experienced players are fairer, but that strategic motives may have changed).*

c) Discuss whether the observation that people might converge towards the predictions of Expected Utility Theory after having gained experience would be a major criticism of the field of Behavioral Economics. You can use your example from above to illustrate your arguments.

- *Possible points to consider in discussion: evidence on the role of experience is mixed, many (important) economic decisions are taken infrequently and by inexperienced agents (e.g., buying house, car, etc.), unclear whether inexperienced agents can get good advice (lack of incentives to offer unbiased advice, possible incentives for other market actors to "exploit" inexperienced subjects).*