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Suggested Answers in Final exam for MA course "Behavioral and Experimental Economics"

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Question 1: General issues in behavioral and experimental economics

a) Rabin (AER 2013) proposes an "Approach to incorporating Psychology into Economics". Name one example where this approach has been successfully employed.

A: The idea of the approach is to "embed preexisting theories as parameter values, while introducing the new psychological assumptions as alternative parameter values". Examples are Fehr and Schmidt (QJE 1999) on inequality aversion, Present bias (Strotz RES 1955, Laibson QJE 1997), Cappelen et al. (JEEA 2013) on moral entitlements, also Tversky and Kahneman (Ectra 1979) on Prospect Theory

b) Rabin (AER 2013: 617) says: "most economic theory is not about developing new assumptions about people …". What is it about, according to Rabin? And what is "the core empirical exercise in economics" in his view?

A: "most economic theory is not about developing new assumptions about people—it is about seeing the implications of fixed assumptions in different economic situations" (in other words: the idea is to "add a twist" to the standard approach and see what can be explained in different economic situations holding this particular "twist" constant). And: "the core empirical exercise in economics is not to identify the existence of phenomena, but to understand their ecological significance." (in other words: the empirical aim is not to show that some anomaly or bias exists but that it matters in a particular context, e.g. in markets, bargaining, voting. The point, in his view, is to move beyond "first-wave" behavioral economics.)

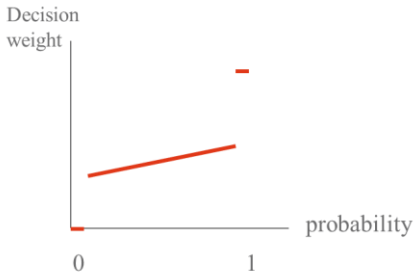
c) Using the notation of Falk and Heckman (Science 2008), suppose a laboratory experiment identifies a strong causal effect of X_1 on Y (given Z) and a field experiment identifies a weaker effect of X_1 on Y (given Z'). What can be concluded for the ability of results from experiments to "generalize" to other environments Z''?

A: It is not clear that one causal effect has more predictive power than the other. It often depends "how similar" Z'' is to either Z or Z'. In general, a theory of how alternative environments Z relate to the effect of a change in X_1 to Y is needed to be able to say whether the result of one or the other experiment "generalizes better" to other environments.

Question 2: Biases in probability estimates

a) According to prospect theory (Kahneman and Tversky, Ecma 1979) people weigh probabilities in a particular way.
i) Provide a (stylized) sketch of the "probability weighting function"
ii) What does the function imply for choices involving low-probability events?

Ai: The figure below is from the lecture notes (but the weighting function is often drawn as a continuous function).



Aii: Low-probability events tend to be over-weighted, i.e. people tend to pay too much attention to unlikely events.

b) Snowberg and Wolfers (JPE 2010) investigate the "favorite long-shot bias". What kind of data source do the authors use to investigate the bias? What do they find, and how does it relate to a) above?
A: The authors study racetrack betting in the US (about 6 mio. Bets on horses, US 1992-2001). Main finding: bettors value long shots (= horses that are unlikely to win the race) more than expected given how rarely they win, and they value favorites too little given how often they win. This finding is consistent with the idea of probability weighting in Prospect theory.

c) The table below is taken from Slembeck and Tyran (JEBO 2004) who study the Monty Hall Game. Interpret the coefficients on *Switchwon*, *Switchlost*, *Switchbonus*, *Time* and $Time^2$ in the first part of the table.
A: The table shows regression results for a probit regression of the probability to "switch" (from the initially chosen door to the "remaining" door, i.e. the initially non-chosen and unopened door). These estimates capture standard learning theories of the reinforcement learning type. *Switchwon* is a dummy variable that takes the value 1 if the decision maker (DM can be a subject or a group) switched in the previous period and won. The coefficient shows that a DM is 33.2% more likely to switch in the consecutive period in that case (positive reinforcement). Conversely, *Switchlost* shows that if the DM switched and did not win ("lost") in the previous period, he is 21.5% less likely to switch in the next period. *Switchbonus* is the cumulative difference of how much the DM would have earned had he always switched in the trials so far minus earnings obtained had he never switched (the coefficient looks small but needs to be multiplied with the difference in period *t*).
The *Time* variables capture the number of periods. The two coefficients together describe an inverse U-shaped relation between switching and a learning effect resulting from mere repetition. That is, there is first a positive learning effect of repetition which then peters out and turns negative (after about period 45).

Dependent Var. switch	d*F*/d*x* (2)	*P* > |*z*| (5)
Learning		
Switchwon	0.3323	0.000
Switchlost	−0.2149	0.000
Switchbonus	0.0017	0.003
Time	0.0135	0.013
$Time^2$	−0.0003	0.008
Institutions		
Competition	0.1435	0.035
Communication	0.1549	0.022
Competition × *Communication*	0.0468	0.375
Interaction of learning and competition		
Competition × *Switchwon*	−0.1434	0.027
Competition × *Switchlost*	0.1407	0.021
Competition × *Switchbonus*	−0.0006	0.415
Competition × *Time*	0.0057	0.076
Interaction of learning and communication		
Communication × *Switchwon*	0.0032	0.961
Communication × *Switchlost*	−0.0964	0.136
Communication × *Switchbonus*	−0.0019	0.010
Communication × *Time*	0.0089	0.006

Number of observations = 1880, Log likelihood = −956.8

d) Croson and Sundali (JRU 2005) provide evidence for the "Gambler's fallacy". Explain the basic intuition of the fallacy. What is the authors' main finding?
A: The GF results from the "law of small numbers" (Tveresky and Kahneman 1971) and is a belief in quick reversal if a deviation from expected proportions is observed in a series of random events (false belief in negative autocorrelation).
The authors study data (in particular the "outside bets", i.e. "Red" vs. "Black") from cameras mounted above roulette tables in a Casino. They find that if a sufficiently long streak of "Red" occurs, gamblers increasingly bet on "Black", consistent with GF.

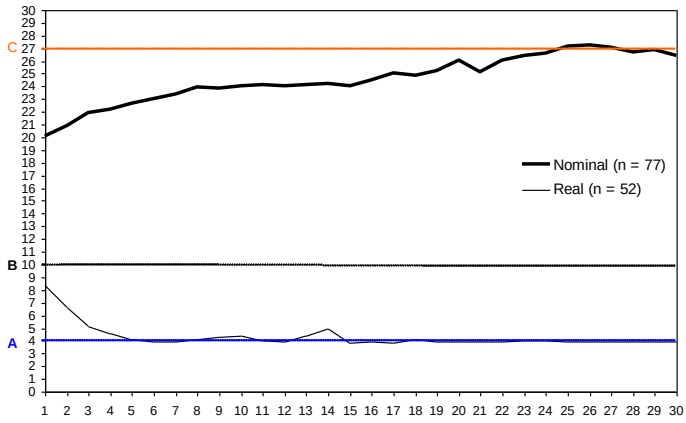
Question 3: Nominal loss aversion and money illusion

a) Explain the expression "nominal loss aversion" (NLA).

A: NLA results from the interaction of loss aversion and money illusion. Loss aversion essentially means that losses loom larger in people's minds than corresponding gains. Money illusion means that people make different choices depending on the nominal representation (often induced by inflation) of the transaction or decision situation.

b) Stephens and Tyran (WP 2012) construct an index of NLA. Explain how the index is constructed. Describe the observed distribution of NLA_i in the Danish population.
A: Subjects are presented with 8 hypothetical scenarios and 732 respondents from all walks of life in DK evaluate hypothetical housing transactions (iLEE). 4 real scenarios framed as nominal loss or gain. The distribution is clearly asymmetric around zero and the mean value biased away from 0 (Thus, it's a bias). About ¾ of subjects have positive NLA_i values, indicating that many are prone to NLA.

c) The figure below shows key results from Fehr and Tyran (GEB 2008). Discuss how these results shed light on the "long-run effects" of money illusion.
(*Hint*: what do the letters A, B, C indicate?)



A: FT (2008) study a pricing game with multiple equilibria (indicated as A, B, C in the figure). B is an unstable equilibrium, A is pareto-dominant, C pareto-dominated (both are stable). Figure shows average prices over all groups when payers play against other subjects (in groups of 5or 6) and when payoffs are presented to subjects either in real terms (RH) or in nominal terms (NH, such that subjects have to deflate the payoffs). Finding: In RH, average prices converge quickly to the "good" equilibrium, but in NH, all groups (slowly) converge to the "bad" equilibrium. Thus, money illusion is a coordination device money illusion in this setting and leads to substantial real cost (average profit is about half in NH than in RH). Since it is a stable equilibrium, individuals have no incentive to unilaterally deviate in a one-shot game (might be interesting to see what happens when they play more periods, there might be some attempts to "strategically teach" others)

Question 4: The role of entitlements and needs in fair sharing

Cappelen, Moene, Sørensen, and Tungodden (JEEA 2013) conduct an experiment to evaluate the role of entitlements and needs in fair sharing.

a) Describe the design of Cappelen et al. (JEEA 2013).

- A: Lab experiment with 391 participants interacting (simultaneously) in Norway, Germany (= high-income countries, HI), and Tansania, Uganda (LI countries). Real effort dictator game: Subjects copy a text distributed on a piece of paper, 30' (in English, which is an official language in Uganda and Tansania). Before they started to work, the computer assigned with equal probability a high or low **price** (piece rate) per correct word to each participant ($0.10 or $0.05). Participants make 8 DG choices: matched with a subject having high/low price in each country. Choice is how to share the total value of production between the two subjects (knowing nationality, price and production). One DG choice was paid.

b) What are the main descriptive results of the study?
(*Hint*: refer to differences in production across countries and assigned "prices", and to sharing patterns across countries)

A: HI-subjects are almost three times as productive as LI-subjects (about 55$ vs. 20$). Doubling the piece rate (high vs. low) has no effect on output. Subjects are "cosmopolitans" (i.e. do not give more to subjects from their own country) but HI-

subjects (and to a lesser degree LI-subjects) give a larger share to LI-subjects: need matters some

c) The authors propose a model of how self-interest is traded off against fairness motives:

$$V^k(y;\cdot) = y - \beta(y - m^e)^2/2X - \delta\alpha(y - m^n)^2/2X$$

Derive the interior solution y^* (assume $\delta = 1$).
(*Hint*: use $\tau = \beta / (\alpha + \beta)$)

A: Take partial derivative of V^k with respect to y, and set it = 0 to obtain:

$$y^* = [\tau m^e + (1 - \tau)m^n] + \frac{X}{\beta + \alpha},$$

d) In the model, the fairness view m^e can take three forms. Characterize these forms by using the following expressions: a_i (production of player i), p_i ("price"), X (total income available for distribution)

A: m^E stands for "egalitarian" (share the total income 50:50, no matter what), m^M stands for "meritocratic" (share in proportion to individual production), and m^L stands for "libertarian" (share according to value of production)

$$m^E = X/2,$$

$$m^M = \frac{a_i}{a_i + a_j}X,$$

$$m^L = p_i a_i,$$

e) How does τ relate to the relative weight given to entitlements vs. needs? (*Hint*: refer to question c above)

A: A person mainly acting on needs considerations has a low β and a high α, and consequently a low τ, whereas the opposite is the case for a person mainly acting on entitlement considerations. Thus, τ captures the relative importance of needs and entitlements in the participants' distributional choices. So, high τ indicates much weight on entitlements and little weight on needs.

f) The authors estimate a random utility model. What are the main findings of the estimation?

A: A majority of subjects (the meritocrats or libertarians) find it morally appropriate to transfer more to a more productive recipient.
A majority of subjects (the egalitarians and the meritocrats) find it not justifiable to take the randomly assigned price («pure luck») into account, i.e. hold the view that fair sharing should compensate for luck.
The estimates (visualized in the distribution of τ in their Figure 4), show that «entitlement considerations were clearly more important than needs considerations for most of the participants in this experiment.»

Question 5: Cooperation and punishment

a) Explain how the "strategy method" can be used to elicit cooperator "types" (e.g. in Thöni, Tyran and Wengström JPubE 2011). Describe the profile (slope) for a free rider and of a conditional cooperator. What distribution of "types" do the authors find in the Danish population?

(A: In the strategy method, players indicate their contributions conditional on all possible contribution levels by others. The set of all conditional choices constitutes a cooperation profile. If a player indicates a flat profile at zero, he is classified as a free rider. If a player indicates a monotonically increasing profile, he is classified as a conditional cooperator. Thöni et al. find that conditional cooperators are the most common group in a (close to) representative Danish sample.)

b) Gächter, Herrmann and Thöni (Science, 2008) observe substantial variation across countries in the "punishment game" (e.g. Fehr and Gächter AER, 2000). How do the authors explain this variation?

(A: depends strongly on the tendency to engage in antisocial ("perverse") punishment of cooperators which in turn is shaped by "norms of civic cooperation" and "rule of law" as measured in surveys)

c) Markussen, Putterman and Tyran (RES, forthcoming) implement a game with voting on formal sanctions. What is the prediction of standard theory for voting and contributions in treatment DC, i.e. when $s = 0.8$ and $c = 2$, if the alternative is no sanctions? How do these predictions change in treatment DE, i.e. when $s = 0.8$ and $c = 8$? How do experimental results compare for voting in DC and DE?

Hint:

$$\pi_i^{FS} = (1-s)(20-C_i) + 0.4\sum_{j\in g} C_j - c$$
$$= 20(1-s) + (0.4+s-1)C_i + 0.4\sum_{j\neq i} C_j - c$$

(A: The predictions for DE and DC are the same: $s = 0.8$ means formal sanctions are deterrent, i.e. rational and self-interested agents do not free ride: $C_i = 20$. Therefore, both DE and DC will be accepted in voting. The results show that DC is mostly accepted – in phase 6 almost 90% vote for DC – but support is much lower for DE – only about 30% vote for DE over no sanctions.)