Theory Field Examination

August 2020

Problem for Econ 207A

Instructions: This part of the exam is closed-book.

1. Suppose $\succsim$ and $\succsim'$ admit maxmin-expected utility representations (u, Q) and $(u, \mathcal{Q}')$ respectively, that is, they share the same utility index over ΔC but have different sets of beliefs. We say $\succsim$ is **more ambiguity-averse** than $\succsim'$ if

$$f \succsim a \Longrightarrow f \succsim' a$$

for all $f \in L$ and $a \in L_c$, where L is the space of all Anscombe–Aumann acts and L_c is the space of constant acts (that is, the space of lotteries). Prove the following:

   (a) Interpret why the proposed definition of "more ambiguity-averse" might be a sensible comparison of ambiguity attitudes across agents.

   (b) If $\mathcal{Q} \supseteq \mathcal{Q}'$, then $\succsim$ is more ambiguity-averse than $\succsim'$.

   (c) If $\succsim$ is more ambiguity-averse than $\succsim$, then $\mathcal{Q} \supseteq \mathcal{Q}'$.

2. Gul and Pesendorfer (2001) say the following defines a **overwhelming temptation** representaton:

$$U(A) = \max_{x \in A} u(x) \text{ subject to } v(x) \geq v(y) \text{ for all } y \in A$$

Prove that an overwhelming temptation representation implies:

   (a) Upper Semi-Continuity: The set $\{B \in \mathcal{A} : B \succsim A\}$ is closed, for all $A \in \mathcal{A}$.[1]

   (b) Lower vNM Continuity: $A \succ B \succ C$ implies $\alpha A + (1 - \alpha)C \succ B$ for some $\alpha \in (0, 1)$.

[1] Recall the Hausdorff distance $d_H(A, B)$ between two sets A and B is defined as

$$d_H(A, B) = \max \left\{ \sup_{x \in A} \inf_{y \in B} d(x, y), \sup_{y \in B} \inf_{x \in A} d(x, y) \right\}$$

Problem for Econ 207B

Instructions: This part of the exam is open-book. You can use any results from lectures notes and papers covered in class.

1. Consider the school choice model with three students $N = \{1, 2, 3\}$, three schools $X = \{a, b, c\}$ each having one seat, and the following priority structure $\succsim$:

$\succsim_a$	$\succsim_b$	$\succsim_c$
1	2, 3	1, 2, 3
2, 3	1	

For each part (a)–(e) below, is there a (single-valued) mechanism that satisfies the listed property(ies)?

(a) Strategyproof and Pareto efficient.

(b) Strategyproof and stable.

(c) Pareto efficient and stable.

(d) Constrained efficient.

(e) Strategyproof and constrained efficient.

Explain your answers clearly: If your answer is yes, give a reference to the result(s) showing that the mechanism you indicate satisfies the listed property(ies) or provide a proof. If your answer is no, provide a counterexample showing that there is no mechanism satisfying the listed property(ies) for the above priority structure.