

Game Theory
Essex Summer School
In-House Exam

Instructions

1) The following game is played repeatedly for an infinite number of periods.

	Cooperate	Defect
Cooperate	β, β	$0, \tau$
Defect	$\tau, 0$	$1, 1$

Assume future payoffs are discounted at a rate of δ^t . Establish a cut-point over δ^t above which mutual cooperation can be sustained by the use of Grim Trigger strategies. (20% of mark) Does mutual cooperation become easier or harder to sustain, at any given level of patience, as β increases? (20%)

2) C is considering whether to challenge some aspect of the status quo, which D may be willing to defend. If C does not challenge, C receives 0 and D receives ν_D . If C does challenge, D must either give in or resist. If D gives in, C receives ν_C while D receives 0. If D resists, C receives $-c_C$ while D receives $\nu_D - c_D$. Let $c_C > 0$, $c_D > 0$, and $\nu_C > 0$ all be common knowledge. However, while D knows the value of ν_D , C only knows that $\nu_D \sim U(\underline{\nu}_D, \bar{\nu}_D]$. Establish a cut-point over ν_C above which C challenges. (20% of mark) Does C become more or less willing to challenge, at any given level of ν_C , as $\bar{\nu}_D$ increases? (20%) As $\underline{\nu}_D$ increases? (20%)