

MA Game Theory

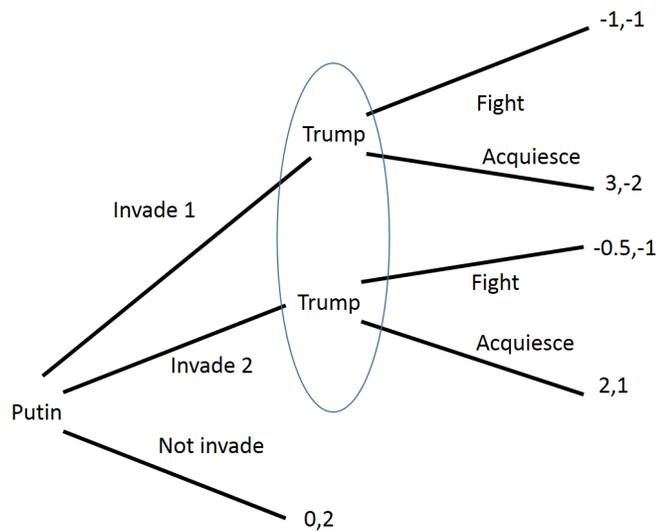
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Homework 4

Due Weds 5th April

Question 1 A couple of questions on Weak Perfect Bayesian Equilibrium

1. Find the WPB equilibria of this game



2. Provide an example of a game with a Weak Perfect Bayesian Equilibrium which is not subgame perfect
3. Show in your example that any Sequential equilibrium of the game is subgame perfect

Question 2 A public project can be built ($k = 1$) or not ($k = 0$) where the cost of the project is 1 if built and 0 if not. Assume two agents. The type of agent 1 (θ_1) is drawn uniformly from $[0, 1]$, while the type of agent 2 is always $\theta_2 = 3/4$. Utilities are given by $u_i = \theta_i k - t_i$, where t_i is the payment of type i .

1. Describe the first-best solution in this economy for a social planner who wants to maximize surplus (i.e. assuming types are observable)
2. Describe the Vickrey-Clarke-Groves mechanism applied to this context.
 - What are the rules of the game?
 - What are the potential messages sent by the two agents?
3. What are the optimal strategy of the two agents? Explain.
4. Show that this mechanism implement the FB solution.
5. Explain why asking agent 1 to contribute more to the funding of the public project in the case that the bridge is built will kill efficiency. Can agent 2 be asked to contribute more to the project?

Question 3 Consider a variant of the 2 type price discrimination model we discussed in class. Assume that the utility of type θ is given by

$$u(q, t|\theta) = \theta q^{\frac{1}{2}} - t$$

Assume that the monopolist has constant marginal costs, so the cost of providing q is given by cq , where c is some positive constant

1. Find the first best solution of this problem
2. Describe the second best solution and compare it to the first best