

Problem Set #5

1 Fibonacci Cinema

Consider a (β, δ) agent. His utility at time t is

$$U_t(u_t, u_{t+1}, \dots, u_T) = u_t + \beta \sum_{s=1}^{T-t} \delta^s u_{t+s}$$

Assume for simplicity that $\beta = .5$ and $\delta = 1$.

This agent can watch 3 movies over the next 4 weeks. He has to spend one week without watching a movie, not seeing a movie gives him 0 utils.

- week 1: mediocre movie = 3 utils
- week 2: good movie = 5 utils
- week 3: great movie = 8 utils
- week 4: excellent movie = 13 utils

1. [10 points] What movie will a sophisticate miss? Solve the game played by the different selves by backward induction.
2. [10 points] What movie will a naive skip? He is unaware of the changes in his preferences, he thinks the future selves will do what the present self thinks they should do.
3. [5 points] Suppose an economist who thinks $\beta = 1$ wants to estimate δ from the naif's behavior. Find an upper bound for δ , i.e. find a condition on δ such that an exponential discounting agent chooses to miss the same movie as the naif agent.

Assume now that the agent can go to only one movie during those 4 weeks.

4. [5 points] What movie will a sophisticate see?
5. [5 points] What movie will a naive see?
6. [5 points] Interpret in terms of who is optimist, who is pessimist, when does it help to be either of those?

2 Deadline

Consider the project that has to be done by deadline T from Lecture 17 Hyperbolics. Recall that the project costs $(\frac{3}{2})^t$ if it is done in period t . It is assumed that $\beta = .5$ and $\delta = 1$. Show that

1. [10 points] If T is even, then sophisticates will do the project in even periods (and not in odd periods).
2. [10 points] If T is odd, then sophisticates will do the project in odd periods (and not in even periods).