Announcement:

Office hour:

1. Friday 11am-12pm
2. Wednesday 4-5 pm

Time Preferences:
Present-biased preferences

EE416 Sem2/2019

O'Donoghue&Rabin(AER 1999): EX3 Immediate cost &nonzero rewards

- Suppose you must write a pa- per this weekend, on Friday night, Saturday, or Sunday. You know the paper will be better if written on either Saturday or Sunday (when you have an entire day). However, it is a mid-November weekend with plenty of sports on TV-pro basketball on Friday night, college football on Saturday, and pro football on Sunday. You prefer watching pro football to college football, and prefer college football to pro basketball. Which sports event do you miss to write the paper?

- The activity to be done once is writing the paper and the costs correspond to the attractiveness of the sports event missed.

O'Donoghue&Rabin(AER 1999): EX3 Immediate cost &nonzero rewards

- Suppose costs are immediate,
- $T = 3$
- $\beta = \frac{1}{2}$ for naifs and sophisticates
- Reward schedule is $\mathrm{V} = (12,18,18)$.
- Cost schedule is $\mathrm{C} = (3,8,13)$.
- TC, with $\beta = 1$, will write report on period 4 ($\tau_{TC} =$ _____) because it maximizes utility.

	$\tau = Fri$	$\tau = Sat$	$\tau = Sun$
$U(\tau)$			

O'Donoghue&Rabin(AER 1999): EX3 Immediate cost &nonzero rewards

- Suppose costs are immediate,
- $T = 3$
- $\beta = \frac{1}{2}$ for naifs and sophisticates
- Reward is $\mathrm{V} = (12,18,18)$.
- Cost schedule is $\mathrm{C} = (3,8,13)$.
- $\beta = \frac{1}{2}$

	$\tau = Fri$	$\tau = Sat$	$\tau = Sun$
At t = 1: $U^{Fri}(\tau)$			
At t = 2: $U^{Sat}(\tau)$			
At t = 3: $U^{Sun}(\tau)$			

O'Donoghue&Rabin(AER 1999): EX3 Immediate cost&non-zero rewards

- Naif:

	$\tau = Fri$	$\tau = Sat$	$\tau = Sun$
At t = 1: $U^{Fri}(\tau)$			
At t = 2: $U^{Sat}(\tau)$			
At t = 3: $U^{Sun}(\tau)$			

- At t = 1: _____ ➔ _____
- At t = 2: _____ ➔ _____
- Write report on_____

O'Donoghue&Rabin(AER 1999): EX3 Immediate reward & nonzero rewards

- Sophisticates:

	$\tau = Fri$	$\tau = Sat$	$\tau = Sun$
At t = 1: $U^{Fri}(\tau)$			
At t = 2: $U^{Sat}(\tau)$			
At t = 3: $U^{Sun}(\tau)$			

- $\tau_{sophisticate} =$ _____

O'Donoghue&Rabin(AER 1999): EX3 Immediate reward & nonzero rewards

- On Friday, sophisticates correctly predict that they will end up writing the paper on Sunday if they do not do it now. Hence, although sophisticates would prefer to write the paper on Saturday, they do it on Friday to prevent themselves from procrastinating until Sunday.
- Because sophisticates are influenced by the sophistication effect in addition to the present-bias effect, the qualitative behavior of sophisticates relative to TCs is complicated. In particular, it can be that sophisticates do not even exhibit the basic present-bias intuition

Proposition 1

- If costs are immediate, then _____.
- If rewards are immediate, then_____.

  - "Naifs believe they will behave like TCs in the future but are more impatient now. Hence, the qualitative behavior of naifs relative to TCs intuitively and solely reflects the present-bias effect."
  - General lesson: The timing of rewards and costs is crucial for a person with present-biased preferences.

Proposition 2

- For all cases, $\tau_{sophisticate} \leq \tau_{naif}$

- General lesson: Sophistication about future present bias can mitigate or exacerbate misbehavior.

Welfare

- To compare “welfare” is to compare “long-run utility comparisons”.
- Long-run utility is

$$U^0(c_1, \dots, c_T) = \sum_{\tau=1}^{T} \delta^\tau u(c_\tau).$$

- Welfare loss for Naifs is

_____

- Welfare loss for Sophisticates is

_____

Proposition 3&4

- For immediate costs, a small present bias can cause severe welfare losses if and only if you are naive.

- For immediate rewards, a small present bias can cause severe welfare losses if and only if you are sophisticated.

- General lesson: Even “small” present bias can cause severe welfare losses.

Empirical Motivations for Present-Biased Preferences

- Suppose you had a choice between getting $50 in cash one month from today, or getting less than $50 today. Would you take less than $50 to get the money today?

- The respondents who answered affirmatively were then asked:
- What is the smallest amount of cash you would take today rather than getting the $50 one month from today?

Empirical Motivations for Present-Biased Preferences

- Experimental evidence on discounting.
- Typical procedure elicits indifference points of the form:

$$A\ at\ date\ x \sim B\ at\ date\ x + y$$

- Then make inferences about discounting reflected in these indifference points

$$\frac{D(x+y)}{D(x)} = \frac{A}{B}$$

  - Assume $u(.)$ is linear.

Empirical Motivations for Present-Biased Preferences

- Hyperbolic discount function is a better fit for $D(x)$ from experimental data than exponential discounting.

Empirical Motivations for Present-Biased Preferences

- Average discount rates are lower for longer delays
- Average discount factor are lower for shorter delays
- More impatient over short delays than over long delays.
- People were indifferent between:

$(\$15\ now) \sim (\$30\ in\ 3\ months)$ ➔ 277% yearly discounting

$(\$15\ now) \sim (\$60\ in\ 1\ year)$ ➔ 139% yearly discounting

$(\$15\ now) \sim (\$100\ in\ 3\ year)$ ➔ 63% yearly discounting

Evidences of Present bias

- Shapiro (2005): Is There a Daily Discount Rate? Evidence from the Food Stamp Nutrition Cycle
- Several government programs, such as SNAP (food stamps) issue. benefits to recipients as a monthly lump sum
- Receive a voucher (~$130) once a month that can only be redeemed for food
- Recipients can choose to consume these benefits all at once or consume them steadily throughout the month

- For certain goods (e.g., food), consumers are likely better off with, at least a somewhat smooth consumption path

Evidences of Present bias

- Shapiro (2005): Is There a Daily Discount Rate? Evidence from the Food Stamp Nutrition Cycle

- Provides evidence that food stamp recipients consume more calories at the beginning of the benefit period than at the end

➔ important for policy

- This daily discount rate suggests implausible long-term discount rates using an exponential discounting model

➔ important for theory

Short-Term vs. Long-Term Patience

Example: Suppose I have a daily discount rate of 0.999

$$\delta = 0.999, t = one\ day$$

- I discount tomorrow's consumption by: _____
- I discount consumption in a year by: _____$= .69$
- I discount consumption in 5 year by: _____$= .16$

- Anything other than (almost) perfect day-to-day patience _____i.e., if we see a daily discount rate that is much less than one, exponential discounting is probably a bad model.