TIME PREFERENCES

MOTIVATIONS FOR PRESENT-BIASED PREFERENCES

SUNSIREE KOSINDESHA

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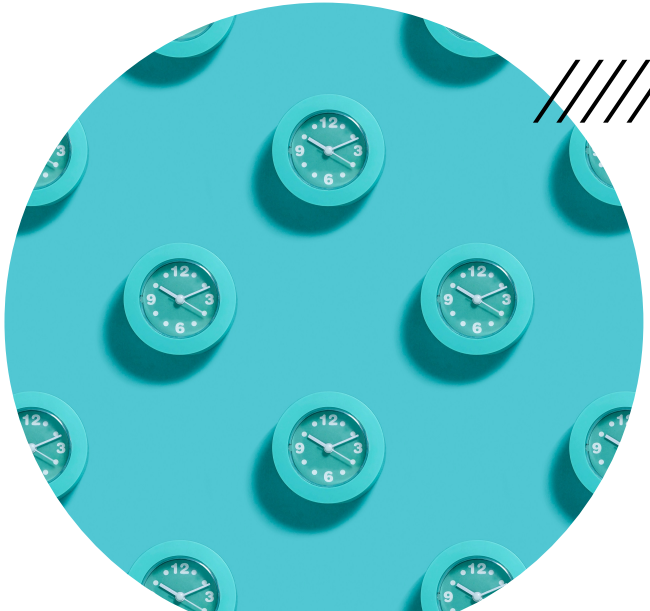
EXPERIMENTAL EVIDENCE ON DISCOUNTING



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?

getting < $50 today vs. getting $50 cash in one month

The respondents who answered affirmatively yes were then asked:

Yes

We would like to get is

? cash today ~ $50 in 1 month

$35

What is the smallest amount of cash you would take today rather than getting the $50 one month from today?

eg. $49 cash today ?
$40 cash today ?
$30 cash today ?
$20 cash today ?
$10 cash today ?

Eliciting discount factor

- Typical procedure elicits indifference points of the form:

elicitation

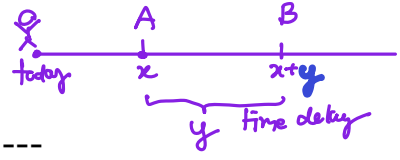
amount of cash

time delay

$$A \text{ at date } x \sim B \text{ at date } x + y$$

date

- Then inferences about discounting reflected in these indifference points are made, typically assuming:
  - amounts treated as increments to consumption in period received
  - linear utility : instantaneous utility is linear



$$D(x) \times A = D(x+y) B$$

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

normally $A < B$, $\frac{D(x+y)}{D(x)} < 1$

- There are two strands of research that differ in how results are framed.

One strand: hyperbolic discounting is a better fit.

- Comparing between two functional forms:Exponential Discounting vs. Hyperbolic Discounting, hyperbolic discounting is virtually always a better fit.
  - Exponential Discounting: $D(x) = e^{-kx}$
  - Hyperbolic Discounting: $D(x) = \frac{1}{1+kx}$

~ present bias
β δ time preference
↑ is called "quasi-hyperbolic discounting"

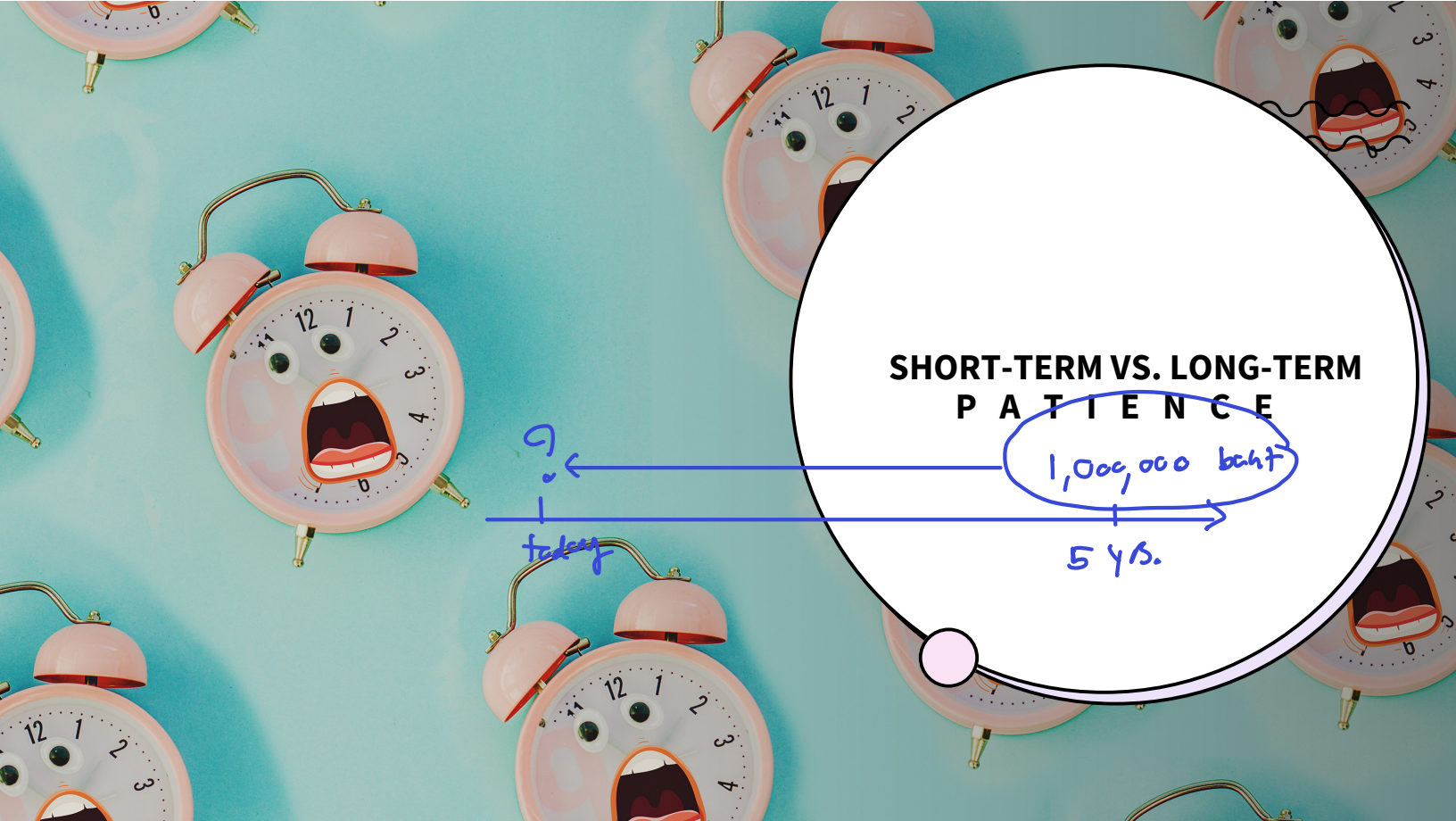
Second strand: evidence of declining discount rates.

- Average discount rates are lower for longer delays. That is, subjects are more impatient over short delays than over long delays.
- In Thaler (1981)'s "Some empirical evidence on dynamic inconsistency", people were indifferent between:

more impatient ↑ high discount rate, low discount fact ∝ 1/discount factor

	Indifference condition	Discount rates
(1) the most impatient	($15, *now*) ~ ($30, *in 3 months*)	→ 277% → lowest discount factor
(2)	($15, *now*) ~ ($60, *in 1 year*)	→ 139%
(3) the least impatient	($15, *now*) ~ ($100, *in 3 years*)	→ 63% → highest discount factor

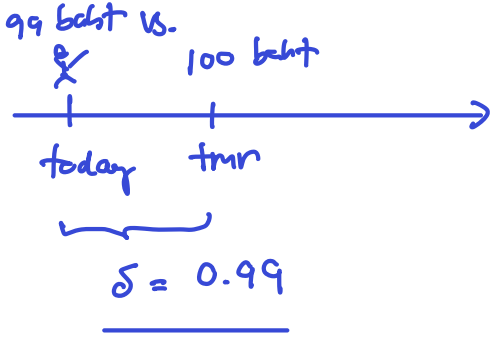
e.g. rate $\delta = \frac{1}{1+\rho}$ → discount fact → discount rate


SHORT-TERM VS. LONG-TERM
PATIENCE
?
1,000,000 baht
today
5 yrs.

Short-Term vs. Long-Term Patience

- Q: Can I have a 1% preference for today over tomorrow?
- A: Usually, people say yes.

Suppose that:

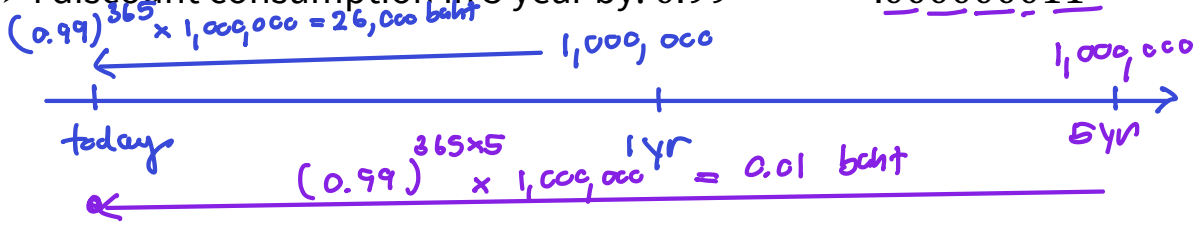


Short-Term vs. Long-Term Patience

Suppose I have a daily discount factor of 0.99

$$\delta = 0.99, t = one\ day$$

- I discount tomorrow's consumption by: 0.99
- Assuming exponential discounting,
  - I discount consumption in a year by: $0.99^{365} = .026$
  - I discount consumption in 5 year by: $0.99^{365\times5} = .000000011$



Short-Term vs. Long-Term Patience

Suppose I have a daily discount factor of 0.98

2% preference for today over tmrw

$$\delta = 0.98, t = one\ day$$

- I discount tomorrow's consumption by: 0.98
- Assuming exponential discounting,
  - I discount consumption in a year by: $0.98^{365} = .0006$
  - I discount consumption in 5 year by: $0.98^{365\times5} = 9.7 \times 10^{-17}$

Short-Term vs. Long-Term Patience

e.g. $\delta = 0.999999999999$
not just $\delta = 0.99$

- Exponential discounting implies almost perfect day-to-day patience ($\delta \approx 1$). That is, exponential discounting implies virtually no discounting , over daily or even weekly decisions.

- This seems counterfactual.

- If we see a daily discount factor that is much less than one, exponential discounting is probably a bad model.

∴ exponential discounting is not a good explanation for short-term impatience.

Reference

- O’Donoghue, Ted. 2019. “Intertemporal choices: Introduction” Lecture Note for ECON 7580, Cornell University
- Tripp, Brandon. 2018. Overheads for ECON 3670, Cornell University