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DOING IT NOW OR LATER?

Matthew Rabin

2001 John Bates Clark Medal recipient

Behavioral Economist

Pershing Square Professor in the Harvard Economics Department and Harvard Business School

Reformulates the theory of procrastination in terms of time inconsistency

What is time inconsistency?

We are "Present-Biased"
We have tendency to:

1. avoid immediate costs
2. grab immediate rewards

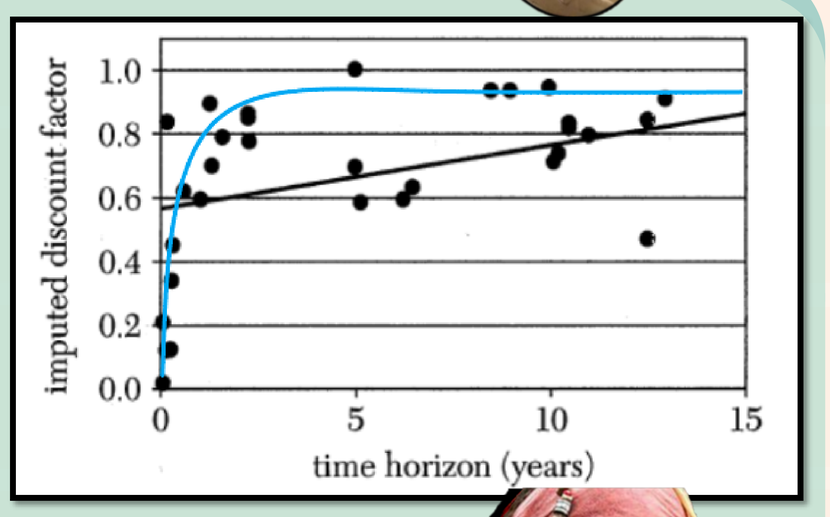
So we **will not** commit to plan

Why is there time inconsistency?

β-δ discounting

$$For\ all\ t,\ U^t(u_t, u_{t+1}, \dots, u_T) = \delta^t u_t + \beta \sum_{\tau=t+1}^{T} \delta^\tau u_\tau ,$$

$$where\ 0 < \beta, \delta \leq 1$$



If β<1, the cost is larger than expected when tomorrow comes.

Being sophisticated always mean better off?

	Immediate Cost	Immediate Reward
Sophisticated	Better off	Worse off
Naive	Worse off	Better off

Sophisticated Individual

Yes! Do you realise you have self-control problem? ✓✓

Yes! Do you foresee yourself not going to commit the plan? ✓✓

Do it earlier!

Naive Individual

No!

No!

Do it later!

Case study (Choose an option)

Assume β = 0.7 , δ = 0.9

Scenario I : Immediate Cost -- Course Project

Given: Work on the project on Day 1, Cost : Δu = -1; Work on the project on Day 2, Cost : Δu = -1.5; Work on the project on Day 3, Cost : Δu = -2

Day 0 - Planning Stage

$U\ (work\ on\ Day\ 1) = \beta\delta^1 u_1 = (0.7)(0.9)(0-1) = -0.63$ ✓

$U\ (work\ on\ Day\ 2) = \beta\delta^2 u_2 = (0.7)(0.9)^2(0-1.5) = -0.85$

$U\ (work\ on\ Day\ 3) = \beta\delta^3 u_3 = (0.7)(0.9)^3(0-2) = -1.02$

Day 1

$U\ (work\ on\ Day\ 1) = \delta^0 u_1 = (1)(0-1) = -1$

$U\ (work\ on\ Day\ 2) = \beta\delta^1 u_2 = (0.7)(0.9)(0-1.5) = -0.95$ ✓ ✗

$U\ (work\ on\ Day\ 3) = \beta\delta^2 u_3 = (0.7)(0.9)^2(0-2) = -1.13$ ✗

Day 2

$U\ (work\ on\ Day\ 2) = \delta^0 u_2 = (1)(0-1.5) = -1.5$ ✗

$U\ (work\ on\ Day\ 3) = \beta\delta^1 u_3 = (0.7)(0.9)(0-2) = -1.26$ ✓

Day 3 - Deadline

$U\ (work\ on\ Day\ 3) = \delta^0 u_3 = (1)(0-2) = -2$ ✓

Naive Individual →

← **Sophisticated Individual**

Backward Induction Assume sophisticated people are perfectly rational. They consider how they make decision in the future to make decision now.

Scenario II : Immediate Reward (Pleasant Task) - Wait for a better movie

Given: Watch bad movie on Day 1, Benefit : Δu = +1; Watch good movie on Day 2, Benefit : Δu = +1.5; Watch the best movie (Johnny Depp movie) on Day 3, Benefit : Δu = +2

Day 0 - Planning Stage

$U\ (watch\ bad\ movie\ on\ Day\ 1) = \beta\delta^1 u_1 = (0.7)(0.9)(1-0) = 0.63$

$U\ (watch\ good\ movie\ on\ Day\ 2) = \beta\delta^2 u_2 = (0.7)(0.9)^2(1.5-0) = 0.85$

$U\ (watch\ Johnny\ Depp\ movie\ on\ Day\ 3) = \beta\delta^3 u_3 = (0.7)(0.9)^3(2-0) = 1.02$ ✓

Day 1

$U\ (watch\ bad\ movie\ on\ Day\ 1) = \delta^0 u_1 = (1)(1-0) = 1$

$U\ (watch\ good\ movie\ on\ Day\ 2) = \beta\delta^1 u_2 = (0.7)(0.9)(1.5-0) = 0.95$ ✗

$U\ (watch\ Johnny\ Depp\ movie\ on\ Day\ 3) = \beta\delta^2 u_3 = (0.7)(0.9)^2(2-0) = 1.13$ ✓ ✗

Day 2

$U\ (watch\ good\ movie\ on\ Day\ 2) = \delta^0 u_2 = (1)(1.5-0) = 1.5$ ✓

$U\ (watch\ Johnny\ Depp\ movie\ on\ Day\ 3) = \beta\delta^1 u_3 = (0.7)(0.9)(2-0) = 1.26$ ✗

Day 3 - Deadline