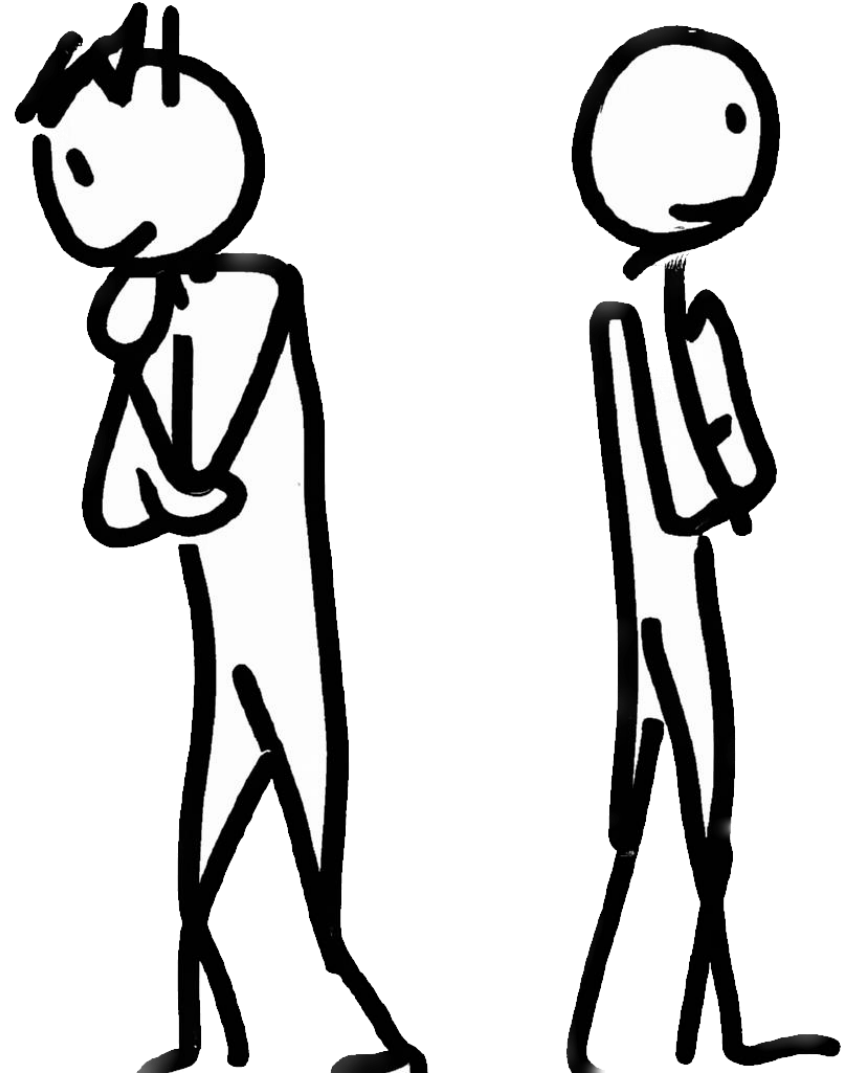


Present bias examples

Notes on Behavioural Economics

Jason Collins



\$100 today or \$110 next week?

\$100 next week or \$110 in two weeks?

Exponential discounter

$$\delta = 0.95$$

$$u(x_n) = x_n$$

\$100 today or \$110 next week?

\$100 today or \$110 next week?

$$U_0(0, \$100) = 100 < 104.5 < U_0(1, \$110)$$

\$100 next week or \$110 in two weeks?

\$100 next week or \$110 in two weeks?

\$100 next week or \$110 in two weeks?

$$U_0(1, \$100) = 95 < 99.275 = U_0(2, \$110)$$

Present biased agent

$$\beta = 0.95$$

$$\delta = 0.95$$

$$u(x_n) = x_n$$

\$100 today or \$110 next week?

\$100 today or \$110 next week?

$$\begin{aligned}U_0(0, \$100) &= u(\$100) \\ &= 100\end{aligned}$$

\$100 today or \$110 next week?

$$\begin{aligned}U_0(1, \$110) &= u(x_0) + \beta \delta u(x_1) \\&= \beta \delta u(\$110) \\&= 0.95 \times 0.95 \times 110 \\&= 99.275\end{aligned}$$

\$100 today or \$110 next week?

$$U_0(0, \$100) = 100 > 99.275 = U_0(1, \$110)$$

\$100 next week or \$110 in two weeks?

\$100 next week or \$110 in two weeks?

$$\begin{aligned}U_0(1, \$100) &= u(x_0) + \beta\delta u(x_1) + \beta\delta^2 u(x_2) \\&= \beta\delta u(\$100) \\&= 0.95 \times 0.95 \times 100 \\&= 90.25\end{aligned}$$

\$100 next week or \$110 in two weeks?

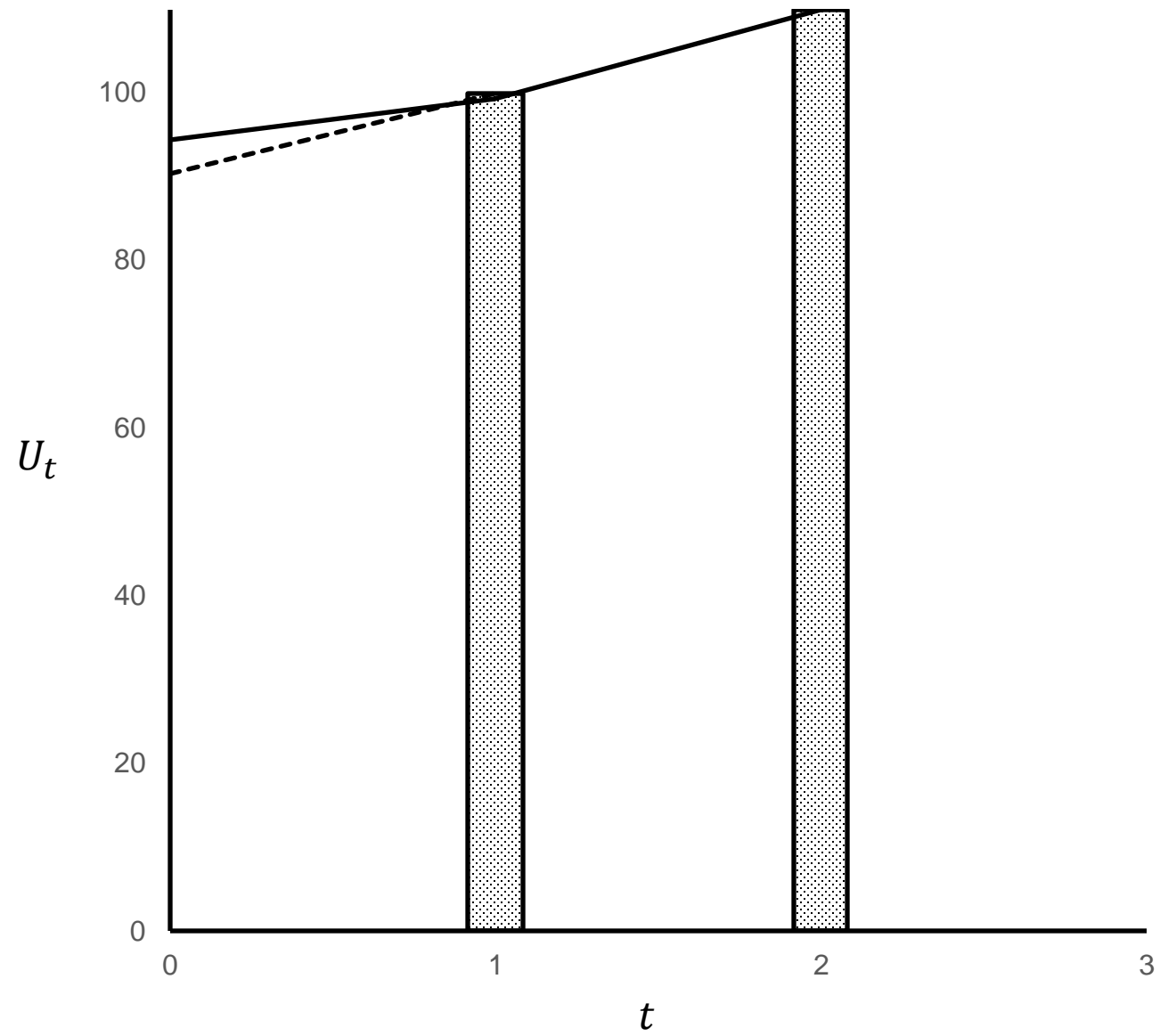
$$\begin{aligned}U_0(2, \$110) &= u(x_0) + \beta\delta u(x_1) + \beta\delta^2 u(x_1) \\&= \beta\delta^2 u(\$110) \\&= 0.95 \times 0.95^2 \times 110 \\&= 94.32\end{aligned}$$

\$100 next week or \$110 in two weeks?

$$U_0(1, \$100) = 90.25 < 94.32 = U_0(2, \$110)$$

$$U_0(0, \$100) = 100 > 99.275 = U_0(1, \$110)$$

$$U_0(1, \$100) = 90.25 < 94.32 = U_0(2, \$110)$$



Present biased agent

$$\beta = 0.75$$

$$\delta = 0.9$$

$$u(x_n) = x_n$$

\$10 in five days ($t = 5$) or \$20 in 10 days ($t = 10$)?

\$10 in five days ($t = 5$) or \$20 in 10 days ($t = 10$)?

$$\begin{aligned}U_0(5, \$10) &= \beta \delta^5 u(\$10) \\&= 0.75 \times 0.9^5 \times 10 \\&= 4.43\end{aligned}$$

\$10 in five days ($t = 5$) or \$20 in 10 days ($t = 10$)?

$$\begin{aligned}U_0(10, \$20) &= \beta \delta^{10} u(\$20) \\&= 0.75 \times 0.9^{10} \times 20 \\&= 5.23\end{aligned}$$

\$10 in five days ($t = 5$) or \$20 in 10 days ($t = 10$)?

$$U_0(5, \$10) = 4.43 < 5.23 = U_0(10, \$20)$$

Five days pass and the agent is now asked if they would like to change their mind.

Five days pass and the agent is now asked if they would like to change their mind.

$$\begin{aligned}U_5(5, \$10) &= u(\$10) \\ &= 10\end{aligned}$$

Five days pass and the agent is now asked if they would like to change their mind.

$$\begin{aligned}U_5(10, \$20) &= \beta \delta^5 u(\$20) \\&= 0.75 \times 0.9^5 \times 20 \\&= 8.86\end{aligned}$$

Five days pass and the agent is now asked if they would like to change their mind.

$$U_5(5, \$10) = 10 > 8.86 = U_{10}(10, \$20)$$

$$U_0(5, \$10) = 4.43 < 5.23 = U_0(10, \$20)$$

$$U_5(5, \$10) = 10 > 8.86 = U_{10}(10, \$20)$$

