MFE: BEHAVIORAL ECONOMICS NOTES

ADEN CHEN

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1. Measuring the Risk Aversion

Recall the relative risk aversion:

$$\gamma = -\frac{xu''}{u'}.$$

Note the constant relative risk aversion utility function (CRRA):

$$u(x) = \begin{cases} \dfrac{x^{1-\gamma}}{1-\gamma}, & \gamma \neq 1, \\ \log x, & \gamma = 1. \end{cases}$$

1.1. Small Lottery.

Consider the lottery $[11, 10; .5, .5]$.

Rejects at $w =$	$\gamma >$
1000	9
2000	18
5000	45

At $w = 10000$, the very sophisticated method I used (Desmos) can't even solve it.

1.2. Big Lottery.

Consider the lottery $[50000, 100000; .5, .5]$. Economists often assume $\gamma \in (0, 2)$.

γ	W_{CE}
1	70 711
2	66 667 [1]
5	58 566
10	53 991
30	51 209

1.3. **Absurd Implication.** Consider again the small lottery.

$$10^{-4} > (10/11)^{100} \implies u'(w+2100) \leq 10^{-4}u'(w).$$

If a risk averse expected utility maximizer rejects the small gamble at any w, then she will reject a $[-100, \infty]$ lottery.

2. Loss Aversion

Compare the following lotteries:

- $[4000; .8]$ and $[3000, 1]$ (most prefer the latter)
- $[-4000; .8]$ and $[-3000, 1]$ (most prefer the former)

People seem to be risk-averse for gains and risk-loving for losses. [2]

3. Framing and Reference Point

Compare the following:

- $[240, 1]$ and $[1000; .25]$.
- $[-750, 1]$ and $[-1000; .75]$.

But $AD = [-760, 240; .75, .25]$ is dominated by $BC = [-750, 250; .75, .25]$.

Framing matters [Bracketing].

4. Endowment Effect, Status Quo Bias

$$WTP \leq WTA.$$

Kahneman, Knetsch, and Thaler [2]:

- Cornell mugs given randomly to half of the students.
- On average we expect half of the mugs to be traded.
- Typically $WTP \approx 1/2WTA$ and around half of trading volume was observed.

5. Prospect Theory

Properties:

- A reference point. (blah blah psychology visual illusion)
- Loss aversion.

$$V(G) = \sum \pi(p)v(x).$$

add properties of π

[1] Table taken from Schilbach [3].

[2] Schilbach [3].

In Benartzi and Thaler [1],

$$v(x) = \begin{cases} x^{\alpha}, & x \geq 0, \\ -\lambda(-x)^{\beta}, & x \geq 0. \end{cases}$$

with the previously[3] estimated parameters $\alpha = \beta = 0.88$ and $\lambda = 2.25$.

- λ captures loss aversion.
- concave when $x \geq 0$ and convex when $x \leq 0$ (Risk aversion)
- x is change not absolute value. (reference dependent; risk aversion)
- $\alpha = \beta < 1$. Diminishing sensitivity.
- There is a sense of framing.

5.1. **Myopic Loss Aversion.** The pairing of prospect theory with framing (frequent evaluation of portfolio) is called myopic loss aversion.

Previous research: how risk averse would the representative investor have to be to explain the historical equity premium. Benartzi and Thaler [1]: given these estimated parameters of prospect theory, what evaluation period is consistent with the equity premium?

One year. This is highly plausible, given the existence of annual reports, and the tex filings, when one would gain a comprehensive evaluation.

5.2. **Which aspects of prospect theory drive the results?** Loss aversion. Using the identity function as the probability weighting function, 11–12 months to 10 months. Using piecewise linear utility function with loss aversion factor 2.25, 8 months.

5.3. **Objections.** A potential objection. Individual decision making vs. organization decision making. The issue of agency.

6. Additional Topics (if there is time left)

- Mental Accounting.
- Hyperbolic Discounting.

expand

References

[1] S. Benartzi and R. H. Thaler. "Myopic Loss Aversion and the Equity Premium Puzzle". In: *The Quarterly Journal of Economics* 110.1 (Feb. 1995), pp. 73–92. ISSN: 1531-4650. DOI: 10.2307/2118511. URL: http://dx.doi.org/10.2307/2118511.

[2] Daniel Kahneman, Jack L. Knetsch, and Richard H. Thaler. "Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias". In: *Journal of Economic Perspectives* 5.1 (Mar. 1991), pp. 193–206. DOI: 10.1257/jep.5.1.193. URL: https://www.aeaweb.org/articles?id=10.1257/jep.5.1.193.

[3] Frank Schilbach. *Lecture 7 & 8: Reference points, loss aversion, and prospect theory*. Accessed: 2024-09-24. 2020. URL: https://ocw.mit.edu/courses/14-13-psychology-and-economics-spring-2020/30de72ba97b788add155104f2ee49266_MIT14_13S20_lec7_8.pdf.

[4] Amos Tversky and Daniel Kahneman. "Advances in prospect theory: Cumulative representation of uncertainty". In: *Journal of Risk and Uncertainty* 5.4 (Oct. 1992), pp. 297–323. ISSN: 1573-0476. DOI: 10.1007/bf00122574. URL: http://dx.doi.org/10.1007/BF00122574.

[3] Tversky and Kahneman [4]