DYNAMIC INCONSISTENCY IN RISKY CHOICE: Evidence from the Lab and Field

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Motivation

Would you accept the gamble?

Most would **not**
Motivation

Would you accept this gamble?

Most would
Motivation

Strictly refusing gamble in isolation: Risk *aversion*

Strictly accepting gamble in sequence: Risk *seeking*

Cannot be explained by *Myopic Loss Aversion*
Dynamic Risk-Taking

- Study motivation for risk-taking in dynamic environments

- Data from large brokerage ($N=190,000$)
  - Unique in **mandating** take-profit and stop-loss orders
  - Observe ex-ante strategies that motivates risk-taking
  - See revisions to strategies

- Data from two pre-registered experiments ($N=940$)
  - Identify theoretical framework
  - Explore policy counterfactuals and welfare implications
Proprietary Online Brokerage Data

Plans and subsequent actions of retail investors
Planned and actual behavior in markets

- Data on 184,521 clients between ‘13-’15
- Required to submit gain-limit and loss-limit with every order
- Map onto initial risk-taking strategies that motivate opening position
- Limits can be revised
Initial strategies

- “Neutral” strategy with equidistant limits

```
WIN 50%  
LOSE 50%  

WIN 50%  
LOSE 50%  

WIN 50%  
LOSE 50%  

WIN 50%  
LOSE 50%  

($20, 1/4)  
($0, 1/2)  
(-$20, 1/4)
```
Initial strategies

- “Gain-Exit” strategy with take-profit closer than stop-loss

(WIN 50% $10, 1/2)

LOSE 50%

(WIN 50% $0, 1/4)

LOSE 50%

($-20, 1/4)
Initial strategies

- “Loss-Exit” strategy with take-profit *further* than stop-loss

- Strategy generates *skew* one-shot gamble couldn’t

- Probability weighting makes entering more attractive
Initial strategies

- "Neutral" strategy is default
- Majority open position as part of a "loss-exit" strategy
- If people follow this strategy, this implies behavior opposite of well-known result to cut gains and chase losses
Ex-post behavior
Two experiments

Identify dynamic inconsistency and mechanism
Design

- Two pre-registered experiments \((N=940)\)
  - Identification from between- and within-subject design
Design

- Similar to One-Shot, but presented with dynamic sequence
Design

- Similar to Sequential, but elicit binding (*non-binding*) strategy
- Identify dynamic inconsistency btw-subject (*within-subject*)

Hard Plan also serves as commitment to strategy
Entry decision

- People more risk-seeking in dynamic environment
  - Strategies do not change EV, and, if anything increase variance
Initial strategies

- 81% of people enter with a “loss-exit” strategy
- Gain-limits are on average 3.8 times larger than loss-limits

95% confidence intervals displayed
Ex-post behavior

- “Gain-exit” behavior!
- Consistent with field data
Mechanism

- Dynamic model with probability weighting and diminishing sensitivity rationalizes set of results (Barberis, 2012).

- Framework predicts:
  - "Loss-exit" initial strategy—explains differential risk-taking
  - "Gain-exit" behavior
  - Demand for commitment

- Results often consistent with *quantitative* predictions of model

- Links dynamic inconsistency to behavioral biases, e.g. disposition effect, excessive trading.
Costs of naivete

- Identify the welfare-relevant domain using behavioral welfare framework by Bernheim and Rangel (2009)
  - Ex-ante choice merits deference

- Calculate welfare costs of naivete for representative agent

Lottery

\[ \text{Sure loss} \]

for up to 26 rounds
Summary

- Accept fair gamble in dynamic sequence that is rejected in isolation

- Begin to take risk as part of "loss-exit" strategy
  - Generates positively skewed outcome distribution not available for one-round risk

- Systematically deviate from plan, chase losses and cut gains
  - Hallmark of dynamic inconsistency
  - (Demand for commitment)

- Together, results identify model of decision-making
  - Predicts dynamic inconsistency and differences in risk-taking (Barberis, '12)
  - Substantial welfare costs of naivete
Thank you!