Topic 14 – Individual decision-making II

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Course in Behavioral and Experimental Economics

Preview of topic 14

Ambiguity

+ Kocher and Trautmann (2007)

Risk

+ Rabin (2000): presentation Johannes Maier

Overconfidence

+ Camerer and Lavollo (1999), Keiber (2006): presentation Casper Siegert

Ambiguity aversion

- Ambiguity aversion: Preference for bets on risky events (known probabilities) over bets on ambiguous events (true uncertainty, unknown probabilities).
- Widely discussed in both psychology and economics literature
- Classics: Knight (1921), Keynes (1921), Ellsberg (1961)
- Econ: modeling, use in theory,
- Psychology: explaining

Applications to market phenomena

For example:

- Equity premium (Maenhout, 2004).
- Excess volatility (Epstein and Wang, 1994).
- Home bias in finance (Uppal and Wang, 2003).
- Under-diversification of incomes risks (Mukerji and Tallon, 2001)

Intuition/problems

- AA can explain puzzles with too much risk aversion implied by economic theory, “ambiguity amplifies risk”.
  But how much AA? When?
- Home bias: foreign assets more ambiguous; driven by ambiguity aversion and foreign assets or ambiguity seeking and local assets?
- Most real world assets ambiguous, what means more-less ambiguous?
- Individual decision or social phenomenon?

Framework for ambiguity

Ellsberg (1961) two-color choice task:

- Two urns with 100 balls either black or red
- Urn A with known 50-50 proportion of colors (risky)
- Urn B with unknown proportion of colors (ambiguous)
- Bet on color of your choice to win prize
- Which urn do subjects prefer to bet on?
- Both urns normatively equivalent (Savage, 1954).

Kocher and Trautmann

- Ambiguity used to explain many market phenomena.
- Little empirical evidence (to say the least).
- Sarin and Weber (1993) find AA in experimental markets.
- Recent theoretical applications to regulation of financial markets
  => role of selection (ambiguous-averse agents do not participate, ambiguous-neutral may have budget constraints)
  => role of correlation between risk and ambiguity attitude

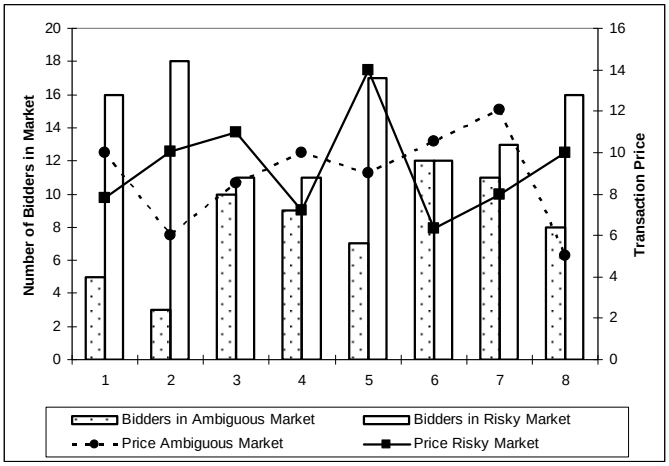
Setup

- Study the effect of selection, constraints and expectations in a very stylized market.
- Let subjects bid (first-price sealed-bid) in large groups for either a risky option or a normatively equivalent ambiguous option (Ellsberg two-color urns, 30€ prize).
- Expected market sizes for the two options and risk attitudes of others relevant for choices (apart from risk and ambiguity attitude).

Design

- 8 sessions, 176 subjects
- Prize in both lotteries 30 Euro
- Risk attitude measured in a separate task of six risky decisions
- Instructions/screens counterbalanced

Results



Results

- 37% ambiguous choices, strong AA.
- Indiv markets: 7x ambiguous market smaller, equal in one session, 14%-50% ambiguous, significant effect of AA.
- Average transaction prices were equal: risky lottery 9.30 vs. ambiguous lottery 8.90.
- Four times risky higher, four times ambiguous higher .

Based on 8 markets, look at individual data.

Results

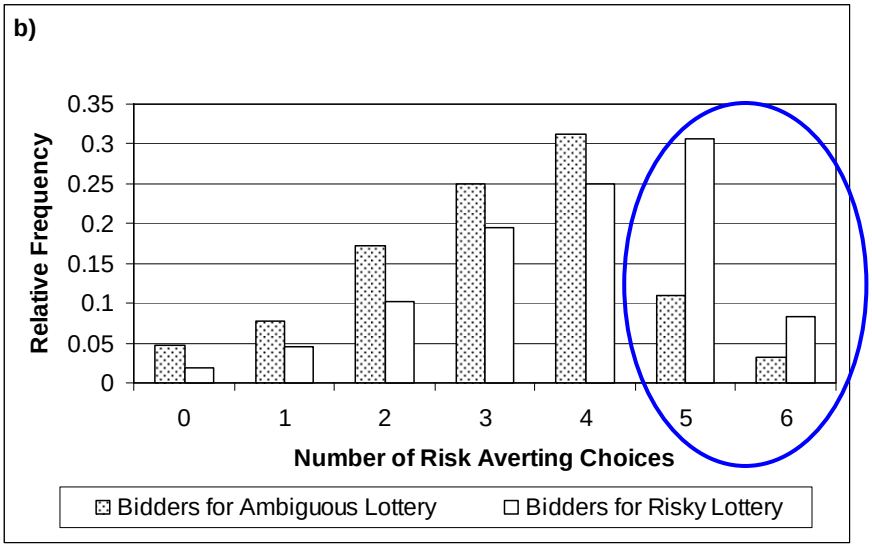
- Equality of prices: (176 observations)

  mean bids 4.30 (amb) vs. 3.43 (risky),

  median bids 4.00 (amb) vs. 3.05 (risky)
- Different market sizes, equal prices? Segmentation in terms of risk aversion?

  => Subjects in risky market are more risk averse.

Results



Correlation RA-AA

Segmentation in terms of risk aversion:

- Probit of market choice on risk attitude significant positive effect of risk attitude

  => 7%-points less likely to take ambiguous for each risk averting choice in Part I.

- OLS of bid on risk attitude significant negative effect

  => 0.40 Euro less per risk averting choice.

Expectations

- We asked subjects about their expectation on market sizes.
- Effect points in wrong direction in probit: More competition for risky option makes subjects more likely to enter that market.

Possible explanations:

- Extreme ambiguity attitude
- Anticipation of AA-RA correlation
- Strategic mistakes

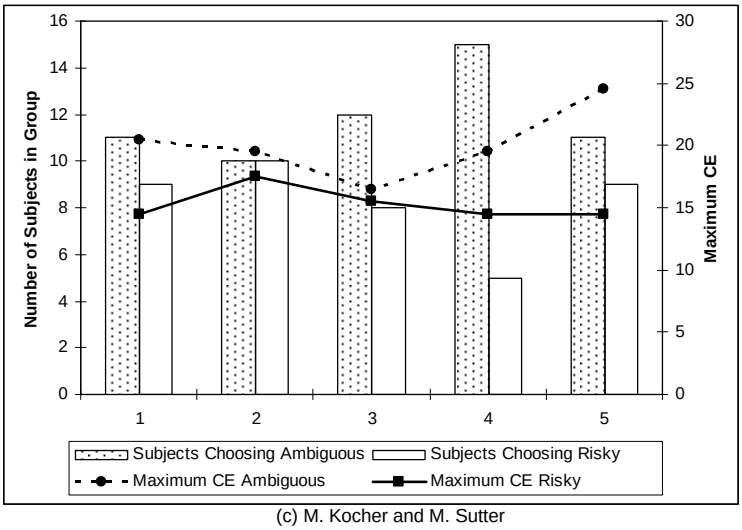
=> Control experiment

Control experiment

- Simple choice of risky option or ambiguous option; one person from each group selected randomly (same ‘size’ incentive as in market).
- Elicit valuation of chosen option, no bid, winning chances do not depend on other bidders’ risk attitudes.

Control experiment

Result:



Control experiment

Result:

- No ambiguity aversion if only market size effect .
- Strategic incentives work (no simple mistakes in auction).
- Shows that in auction, subjects anticipate other bidders risk attitudes.

Summary

1. Ambiguity aversion persists in markets and has an effect on market size.
2. Heterogeneity in ambiguity attitude matters if market institution supports segmentation (budget constraints, cost of information collection), effect on prices.
3. Found evidence for correlation between risk aversion and ambiguity aversion.
4. Agents correctly anticipate correlation and avoid markets with ambiguity/risk seekers .