Behavioral Economics

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Lecture 2: Probability Weighting Functions

Today's Topics

1. Behavioral model: Probability weighting function

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    - Empirical phenomena: Allais' aradox and fourfold pattern of risk
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2. Prospect Theory

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    - Empirical phenomena: Allais' aradox and fourfold pattern of risk
    - Probability weighting function.
2. Prospect Theory
3. Applications

Risk

- We continue studying choice under risk.

Risk

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- We now discuss further deviations from Expected Utility.
    - Expected Utility is the traditional model of choice under risk.
    - The behaviors we will discuss today cannot be explained by reference dependence (S-shaped function).

1. Behavioral Model: Probability Weighting Function

- Empirical Phenomena: Allais' paradox and Fourfold pattern of risk
- Probability Weighting Function

Phenomenon 3

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- **Problem 1** which lottery would you choose?
  - Option A. 100% chance to win 10 Euro
  - Option B. 10% chance to win 50 Euro, 89% chance to win 10 Euro and 1% chance to win 0 Euros.

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  - Option B. 10% chance to win 50 Euro, 89% chance to win 10 Euro and 1% chance to win 0 Euros.
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- Only 7% of you chose that option :(.

Phenomenon 3

- **Problem 2** which lottery would you choose?
  - Option A. 11% chance to win 10 Euro, and 0 Euro otherwise.
  - Option B. 10% chance to win 50 Euro, and 0 Euro otherwise.
- In this problem, option B is typically preferred to A.

Phenomenon 3

- **Problem 2** which lottery would you choose?
  - Option A. 11% chance to win 10 Euro, and 0 Euro otherwise.
  - Option B. 10% chance to win 50 Euro, and 0 Euro otherwise.
- In this problem, option B is typically preferred to A.
- 100 % of you chose that option.

Phenomenon 3: Allais Paradox

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- Assume expected utility
- In **Problem 1**, option A is typically preferred to Option B.

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$$u(W+10) > 0.10 \cdot u(W+50) + 0.89 \cdot u(W+10) + 0.01 \cdot u(W)$$

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- In **Problem 2**, Option B is typically preferred to Option A.

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$$u(W+10) > 0.10 \cdot u(W+50) + 0.89 \cdot u(W+10) + 0.01 \cdot u(W)$$

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- In **Problem 2**, Option B is typically preferred to Option A.
  - This preference implies

$$0.11 \cdot (W+10) + 0.89 \cdot u(W) < 0.1 \cdot u(W+50) + 0.9 \cdot u(W)$$

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- Paradox! proposed by Maurice Allais (1953).

Phenomenon 3: Allais Paradox

- The S-shaped utility that we discussed in the previous lecture cannot solve this paradox.
- If you assume $RP = W$, the same contradiction will emerge.
  - in the equations of the previous slide W is dropped everywhere and the inequalities hold.

Phenomenon 4

- **Problem 3.** which of the lotteries would you choose?
  - Option A. 100% chance to win 2 Euro
  - Option B. 10% chance to win 20 Euro and nothing otherwise.

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  - Option A. 100% chance to win 2 Euro
  - Option B. 10% chance to win 20 Euro and nothing otherwise.
- In this problem, option B is typically preferred to A.
- 57% of you chose that option :) .

Phenomenon 4

- **Problem 4.** which lottery would you choose?
  - Option A. 100% chance to win 18 Euro
  - Option B. 90% chance to win 20 Euro and nothing otherwise.

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  - Option A. 100% chance to win 18 Euro
  - Option B. 90% chance to win 20 Euro and nothing otherwise.
- In this problem, option A is typically preferred to B.

Phenomenon 4

- **Problem 4.** which lottery would you choose?
  - Option A. 100% chance to win 18 Euro
  - Option B. 90% chance to win 20 Euro and nothing otherwise.
- In this problem, option A is typically preferred to B.
- 88% of you chose that option :) .

Phenomenon 4

- **Problem 5** which lottery would you choose?
  - Option A. 100% chance to lose 2 Euro
  - Option B. 10% chance to lose 20 Euro and nothing otherwise.

Phenomenon 4

- **Problem 5** which lottery would you choose?
  - Option A. 100% chance to lose 2 Euro
  - Option B. 10% chance to lose 20 Euro and nothing otherwise.
- In this problem, option A is typically preferred to B.

Phenomenon 4

- **Problem 5** which lottery would you choose?
  - Option A. 100% chance to lose 2 Euro
  - Option B. 10% chance to lose 20 Euro and nothing otherwise.
- In this problem, option A is typically preferred to B.
- 51% of you chose that option.

Phenomenon 4

- **Problem 6** which lottery would you choose?
  - Option A. 100% chance to lose 18 Euro
  - Option B. 90% chance to lose 20 Euro and nothing otherwise.

Phenomenon 4

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Phenomenon 4

- **Problem 6** which lottery would you choose?
  - Option A. 100% chance to lose 18 Euro
  - Option B. 90% chance to lose 20 Euro and nothing otherwise.
- In this problem, option B is typically preferred to A.
- 81% of you chose that option.

Phenomenon 4: Fourfold Pattern

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- **Definitions (Review)**
  - Risk averse: Prefer the expected value of a lottery to the lottery itself.
  - Risk seeking: Prefer a lottery to the expected value of the lottery

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  - Risk averse: Prefer the expected value of a lottery to the lottery itself.
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- In **Problem 3**, most people choose B.
  - Risk seeking

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- **Definitions (Review)**
  - Risk averse: Prefer the expected value of a lottery to the lottery itself.
  - Risk seeking: Prefer a lottery to the expected value of the lottery
- In **Problem 3**, most people choose B.
  - Risk seeking
- in **Problem 4**, most people choose A.
  - Risk averse

Phenomenon 4: Fourfold Pattern

- **Definitions (Review)**
  - Risk averse: Prefer the expected value of a lottery to the lottery itself.
  - Risk seeking: Prefer a lottery to the expected value of the lottery
- In **Problem 3**, most people choose B.
  - Risk seeking
- in **Problem 4**, most people choose A.
  - Risk averse
- In **Problem 5**, most people choose A.
  - Risk averse

Phenomenon 4: Fourfold Pattern

- **Definitions (Review)**
  - Risk averse: Prefer the expected value of a lottery to the lottery itself.
  - Risk seeking: Prefer a lottery to the expected value of the lottery
- In **Problem 3**, most people choose B.
  - Risk seeking
- in **Problem 4**, most people choose A.
  - Risk averse
- In **Problem 5**, most people choose A.
  - Risk averse
- In **Problem 6**, most people choose B.
  - Risk seeking

Phenomenon 4: Fourfold Pattern

- **Fourfold Pattern of risk attitudes**

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  - Risk seeking for small probabilities of gains.

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Phenomenon 4: Fourfold Pattern

- The S-shaped utility function in the previous lecture is not enough to accommodate the fourfold pattern.

Phenomenon 4: Fourfold Pattern

- The S-shaped utility function in the previous lecture is not enough to accommodate the fourfold pattern.
- Not only gains and losses matter but probabilities too!

Probability Weighting Function

Probability Weighting Function

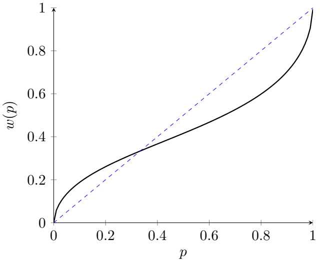

Figure: An example of a probability weighting function

- Outcomes are transformed by a utility function. Why not probabilities?

Probability Weighting Function

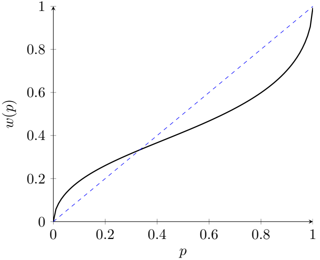

Figure: An example of a probability weighting function

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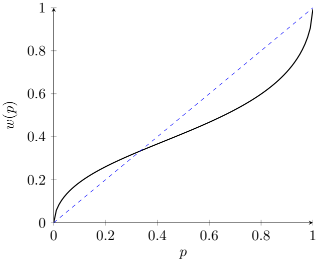
  - A change from 100% to 99% may have a huge **psychological** impact: no certainty anymore. (See our Phenomenon 3).

Probability Weighting Function



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    - Same from 0% to 1% (See the phenomenon 4).

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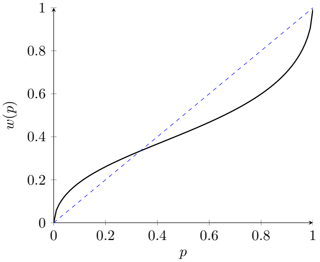

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  - A change from 100% to 99% may have a huge **psychological** impact: no certainty anymore. (See our Phenomenon 3).
  - Same from 0% to 1% (See the phenomenon 4).
  - But what about a change from 51% to 52%. Does it feel very different?

Probability Weighting Function

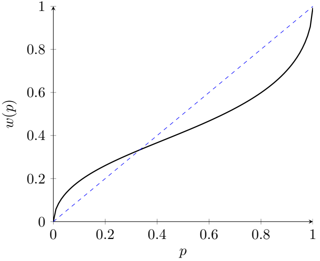

Figure: An example of a probability weighting function

- Outcomes are transformed by a utility function. Why not probabilities?
  - A change from 100% to 99% may have a huge **psychological** impact: no certainty anymore. (See our Phenomenon 3).
  - Same from 0% to 1% (See the phenomenon 4).
  - But what about a change from 51% to 52%. Does it feel very different?
- The probability weighting function should display that *diminishing sensitivity* to probabilities.

2. Prospect Theory

Prospect Theory

Prospect Theory

- We can now define Prospect Theory with its two components.
  - A utility defined on gains and losses and not on final wealth, and with loss aversion.

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Prospect Theory

- We can now define Prospect Theory with its two components.
  - A utility defined on gains and losses and not on final wealth, and with loss aversion.
  - Probability weighting function.
    - Kahneman and Tversky (1979)'s version of prospect theory has some problems.
    - **We will focus on the 1992 version, also called Cumulative Prospect Theory.**

Figure: Amos Tversky & Daniel Kahneman (Nobel Prize 2002)

Prospect Theory: 2 positive outcomes

- consider $(p_1, x_1; p_2, x_2)$ with $x_1 \geq x_2 \geq 0$.

Prospect Theory: 2 positive outcomes

- consider $(p_1, x_1; p_2, x_2)$ with $x_1 \geq x_2 \geq 0$.

$$PT = w^+(p_1) \cdot u(x_1) + \big(1 - w^+(p_1)\big) \cdot u(x_2)$$

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with u and w^+ nondecreasing, $u(0) = 0$, $w^+(0) = 0$ and $w^+(1) = 1$.

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- w^+ is the weighting function for gains.

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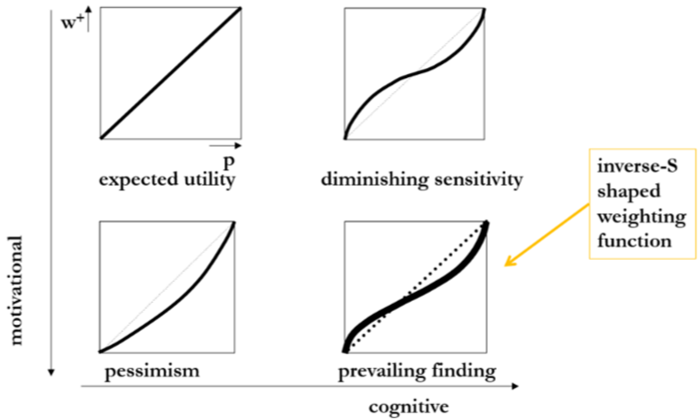
  with u and w^+ nondecreasing, $u(0) = 0$, $w^+(0) = 0$ and $w^+(1) = 1$.
- w^+ is the weighting function for gains.
- If $w^+(p) = p$, Prospect Theory becomes Expected Utility with u defined on changes of wealth.

Typical weighting function for gains



Prospect Theory: 2 negative outcomes

- Now consider $(p_1, x_1; p_2, x_2)$ with $0 \geq x_1 \geq x_2$.

Prospect Theory: 2 negative outcomes

- Now consider $(p_1, x_1; p_2, x_2)$ with $0 \geq x_1 \geq x_2$.

$$PT = w^{-}(p_2) \cdot u(x_2) + \big(1 - w^{-}(p_2)\big) \cdot u(x_1)$$

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- Now consider $(p_1, x_1; p_2, x_2)$ with $0 \geq x_1 \geq x_2$.

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with u and w^- nondecreasing, $u(0) = 0$, $w^-(0) = 0$ and $w^-(1) = 1$.

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  with u and w^- nondecreasing, $u(0) = 0$, $w^-(0) = 0$ and $w^-(1) = 1$.
- w^- is the weighting function for losses.

Prospect Theory: 2 negative outcomes

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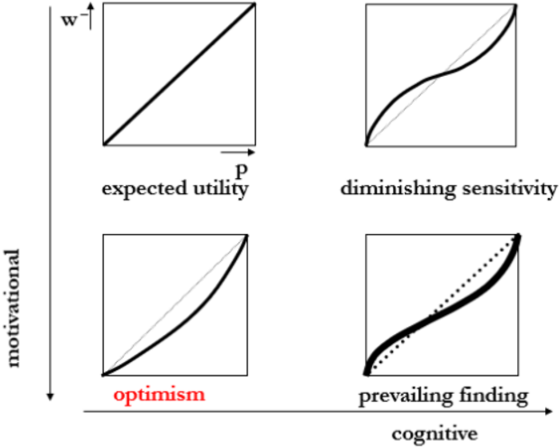
  with u and w^- nondecreasing, $u(0) = 0$, $w^-(0) = 0$ and $w^-(1) = 1$.
- w^- is the weighting function for losses.
- If $w^-(p) = p$, Prospect Theory becomes Expected Utility with u defined on changes of wealth.

Typical weighting function for losses



Prospect Theory: 3 positive outcomes

- Now consider $(p_1, x_1; p_2, x_2; p_3, x_3)$ with $x_1 \geq x_2 \geq x_3 \geq 0$

Prospect Theory: 3 positive outcomes

- Now consider $(p_1, x_1; p_2, x_2; p_3, x_3)$ with $x_1 \geq x_2 \geq x_3 \geq 0$

$$PT = w^+(p_1) \cdot u(x_1) + \big(w^+(p_1 + p_2) - w^+(p_1)\big) \cdot u(x_2) + \big(1 - w^+(p_1 + p_2)\big) \cdot u(x_3)$$

Prospect Theory: 3 positive outcomes

- Now consider $(p_1, x_1; p_2, x_2; p_3, x_3)$ with $x_1 \geq x_2 \geq x_3 \geq 0$

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with u and w^+ like before.

Prospect Theory: 3 positive outcomes

- Now consider $(p_1, x_1; p_2, x_2; p_3, x_3)$ with $x_1 \geq x_2 \geq x_3 \geq 0$

$$\begin{aligned} PT = & w^+(p_1) \cdot u(x_1) + \big(w^+(p_1 + p_2) - w^+(p_1)\big) \cdot u(x_2) + \\ & \big(1 - w^+(p_1 + p_2)\big) \cdot u(x_3) \end{aligned}$$

  with u and w^+ like before.
- Note that $w^+(p_1 + p_2 + p_3) - w^+(p_1 + p_2) = 1 - w^+(p_1 + p_2)$.

Allais Paradox and Prospect Theory

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Allais Paradox and Prospect Theory

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- In **Problem 1** A is typically preferred to B
  - This preference implies

$$
\begin{aligned}
u(10) >& w^+(0.10) \cdot u(50) + \left(w^+(0.99) - w^+(0.10)\right) \cdot u(10) \\
& + \left(1 - w^+(0.99)\right) \cdot u(0) \\
\Rightarrow & \left(1 - w^+(0.99)\right) + w^+(0.10)\big) \cdot u(10) > w^+(0.10)u(50)
\end{aligned}
$$

Allais Paradox and Prospect Theory

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$$\Rightarrow \big(1 - w^+(0.99)\big) + w^+(0.10)\big) \cdot u(10) > w^+(0.10)u(50)$$

- In **Problem 2**, B is typically preferred to A
  - This preference implies

$$w^+(0.11) \cdot u(10) + \big(1 - w^+(0.10)\big) \cdot u(0) < w^+(0.10) \cdot u(50) + \big(1 - w^+(0.10)\big) \cdot u(0)$$

$$\Rightarrow w^+(0.11) \cdot u(10) < w^+(0.10)u(50)$$

Allais Paradox and Prospect Theory

- Assume the model of the previous slide with $RP = W$.
- In **Problem 1** A is typically preferred to B
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$$\begin{aligned} u(10) >& w^+(0.10) \cdot u(50) + \big(w^+(0.99) - w^+(0.10)\big) \cdot u(10) \\ &+ \big(1 - w^+(0.99)\big) \cdot u(0) \end{aligned}$$

$$\Rightarrow \big(1 - w^+(0.99)\big) + w^+(0.10)\big) \cdot u(10) > w^+(0.10)u(50)$$

- In **Problem 2**, B is typically preferred to A
  - This preference implies

$$\begin{aligned} w^+(0.11) \cdot u(10) + \big(1 - w^+(0.10)\big) \cdot u(0) < \\ w^+(0.10) \cdot u(50) + \big(1 - w^+(0.10)\big) \cdot u(0) \end{aligned}$$

$$\Rightarrow w^+(0.11) \cdot u(10) < w^+(0.10)u(50)$$

- No paradox anymore, we just learned something about w^+. Namely, that

$$w^+(0.11) - w^+(0.10) < w^+(1) - w^+(0.99).$$

Prospect Theory: 2 positive and 2 negative outcomes

- consider $(p_1, x_1; ...; p_4, x_4)$ with $x_1 \geq x_2 \geq 0 \geq x_3 \geq x_4$

Prospect Theory: 2 positive and 2 negative outcomes

- consider $(p_1, x_1; ...; p_4, x_4)$ with $x_1 \geq x_2 \geq 0 \geq x_3 \geq x_4$

$$
\begin{aligned}
PT =& w^+(p_1) \cdot u(x_1) + \big(w^+(p_1 + p_2) - w^+(p_1)\big) \cdot u(x_2) + \\
& w^-(p_4) \cdot u(x_4) + \big(w^-(p_3 + p_4) - w^-(p_4)\big) \cdot u(x_3)
\end{aligned}
$$

Prospect Theory: 2 positive and 2 negative outcomes

- consider $(p_1, x_1; ...; p_4, x_4)$ with $x_1 \geq x_2 \geq 0 \geq x_3 \geq x_4$

$$PT = w^+(p_1) \cdot u(x_1) + \big(w^+(p_1 + p_2) - w^+(p_1)\big) \cdot u(x_2) + \\ w^-(p_4) \cdot u(x_4) + \big(w^-(p_3 + p_4) - w^-(p_4)\big) \cdot u(x_3)$$

- with u, w^+, and w^- like before.

Prospect Theory: General

- consider $(p1, x_1; ...; p_n, x_n)$ such that $x_1 \geq x_2 \geq ... \geq x_k \geq 0 \geq x_{k+1} \geq ... \geq x_n$
- Evaluated as

Prospect Theory: General

- consider $(p1, x_1; ...; p_n, x_n)$ such that $x_1 \geq x_2 \geq ... \geq x_k \geq 0 \geq x_{k+1} \geq ... \geq x_n$
- Evaluated as

$$PT = \sum_{j=1}^{k} \left(w^+\Big(\sum_{i=1}^{j} p_i\Big) - w^+\Big(\sum_{i=1}^{j-1} p_i\Big)\right) \cdot u(x_j) +$$

$$\sum_{j=k+1}^{n} \left(w^-\Big(\sum_{i=j}^{n} p_i\Big) - w^-\Big(\sum_{i=j+1}^{n} p_i\Big)\right) \cdot u(x_j)$$

- with u, w^+, and w^- like before.

Prospect Theory: General

- For the exam: Remember

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  - The RP and the S-shaped utility.

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  - The focus on extreme outcomes (both negative and positive) and the inverse-S shaped weighting function.

Prospect Theory: General

- For the exam: Remember
  - The RP and the S-shaped utility.
  - The focus on extreme outcomes (both negative and positive) and the inverse-S shaped weighting function.
  - The way PT works based on the previous slides.

3. Applications of Prospect Theory

Reference-dependence and marathon runners (Allen et al., 2016)

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- Marathon running is ideal to look for field evidence of reference dependence.

Reference-dependence and marathon runners (Allen et al., 2016)

- Marathon running is ideal to look for field evidence of reference dependence.
- Clear and stable reference points.
  - Runners think about their performance relative to round numbers.
  - A runner may feel significantly better about herself if she runs a 3:59 marathon as opposed to a 4:01 marathon

Figure: Run!

Reference-dependence and marathon runners (Allen et al., 2016)

- 9,662,855 marathon finishes were analyzed.
- Chip technology to monitor times.

Reference-dependence and marathon runners (Allen et al., 2016)

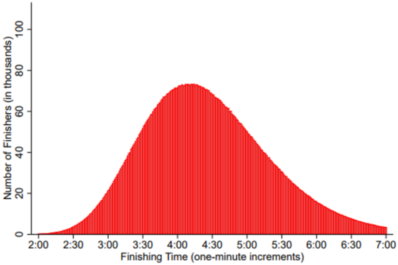
- 9,662,855 marathon finishes were analyzed.
- Chip technology to monitor times.
- 6888 marathons
  - from 1970-2013 (90.14% is 2000 or later).

	Total Marathon Sample		
	Mean	Std. Dev.	Observations
Finishing time (HH:MM:SS)	4:26:34	0:59:19	9,662,845
Marathon year	2005.98	6.46	9,662,845
Age	39.38	11.6	5,330,457
Male (1 = Male, 0 = Female)	0.66	0.48	7,968,042
Split 10 kilometers (HH:MM:SS)	1:02:23	0:17:57	2,068,431
Split half marathon (HH:MM:SS)	2:09:20	0:28:19	3,258,155
Split 30 kilometers (HH:MM:SS)	3:12:27	0:44:53	1,504,567
Split 40 kilometers (HH:MM:SS)	4:25:04	1:01:09	1,040,151

Figure: Descriptive statistics

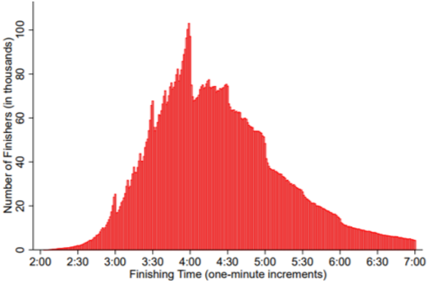
Reference-dependence and marathon runners (Allen et al., 2016)

- Many marathons!
- Law of Large Numbers: would expect finishing times to resemble a smooth distribution



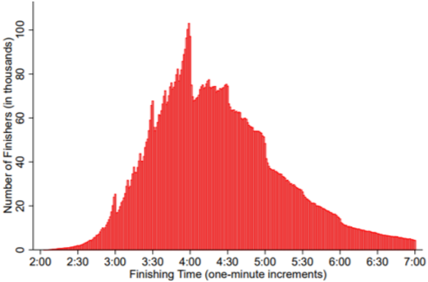
Reference-dependence and marathon runners (Allen et al., 2016)

- Actual distribution looks like this.
  - Bunching below round (half-hour) finishing times.
- Consistent with reference dependence where reference point is a goal



Reference-dependence and marathon runners (Allen et al., 2016)

- Focus on round numbers
  - easier to follow, unlike, say, the exact finishing time of a close friend
  - round numbers are frequently mentioned as goals by marathon runners themselves
- Clear excess mass just to the left of the 30-minute marks.



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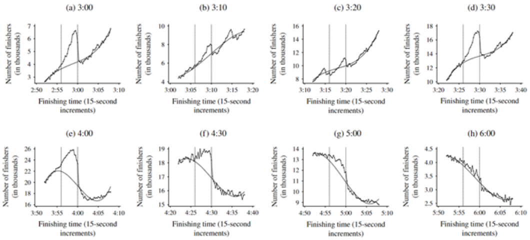

Figure: Bunching

- In the absence of reference-dependence, we would not observe this bunching in the data.
- In not so popular rounding times, the bunching is less severe.

Reference-dependence and marathon runners (Allen et al., 2016)

- About 30% of runners increase their speed in the last 2.195 kilometers.
- This fraction of runners increases to almost 40% if a runner was right on target to finish at a round number.

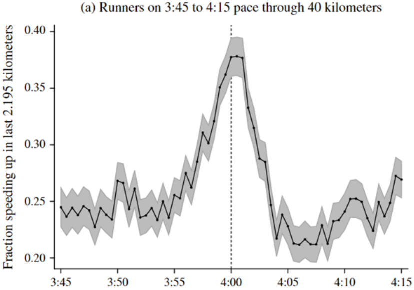

Figure: Speeding up

Reference-dependence and marathon runners (Allen et al., 2016)

- runners who were just on pace to reach a round number were significantly less likely to slow down in the last leg of the marathon.

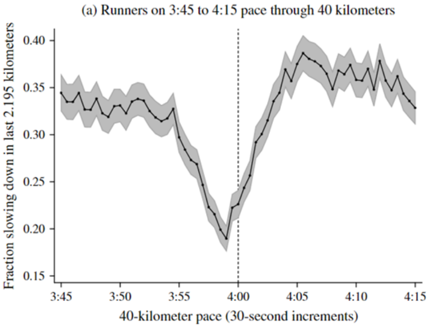

Figure: Slowing down

Pay, Reference Points, and Police Performance (Mas, 2006)

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- Police unions and municipalities negotiate wage raises.
- In the eventuality of an impasse, both parties turn up to a final offer arbitrartion (FOA).
  - both parties submit offers to an arbitrator.
  - arbitrator chooses one of the offers.
- If the union's offer is the policeperson reference point, the arbitrator's decision can be regarded as a gain or a loss.
  - a loss can be demotivating (it generates strong disutility).

Pay, Reference Points, and Police Performance (Mas, 2006)

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  - 1978-1996
  - FOA between municipalities and unions.
  - data on police effectivenes: crimes cleared and felony arrests.

Pay, Reference Points, and Police Performance (Mas, 2006)

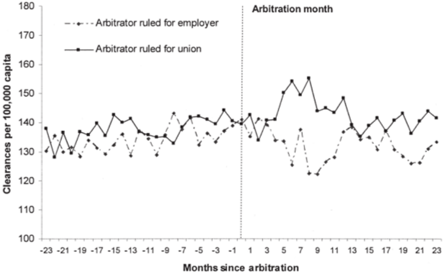

Figure: Comparison of Union and Employer City Average Clearance Rates

- Prior to arbitration, Union and Employer municipalities had similar monthly clearance rates.

Pay, Reference Points, and Police Performance (Mas, 2006)

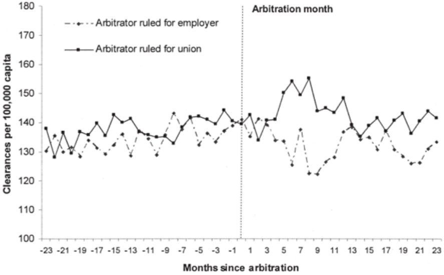

Figure: Comparison of Union and Employer City Average Clearance Rates

- Prior to arbitration, Union and Employer municipalities had similar monthly clearance rates.
- After arbitration, Union municipalities clear more crimes.

Pay, Reference Points, and Police Performance (Mas, 2006)

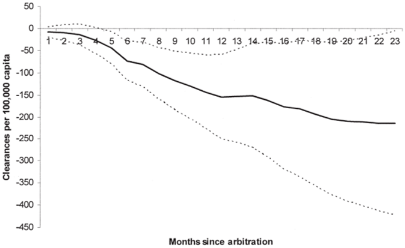

Figure: Difference in Clearances between Employer and Union Cities in Postarbitration Month

- Difference in clearances between "Employer" and "Union" municipalities is more than 225 crimes cleared by arrest per 100,000 capita.

Pay, Reference Points, and Police Performance (Mas, 2006)

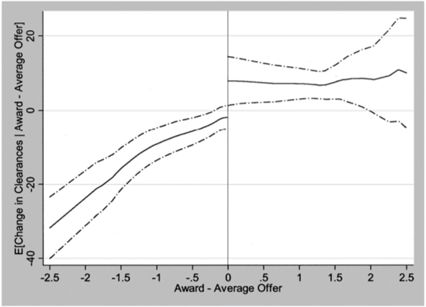

Figure: Change in Clearances Conditional on the Deviation of the Award from the Average of the Offers

- When police lose in arbitration, there is a positive relationship between effort and the gap between the pay raise demanded and the actual award.

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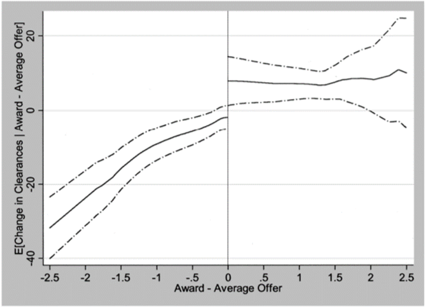

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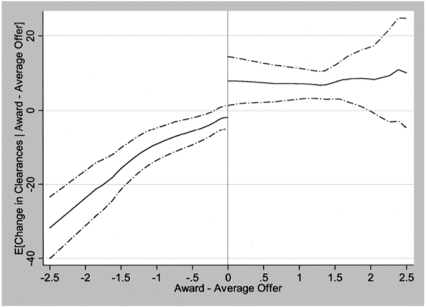

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- When police lose in arbitration, there is a positive relationship between effort and the gap between the pay raise demanded and the actual award.
- This is not the case when the award increment is higher than the police offer.
- Evidence that losses resonate more than gains.

Pay, Reference Points, and Police Performance (Mas, 2006)

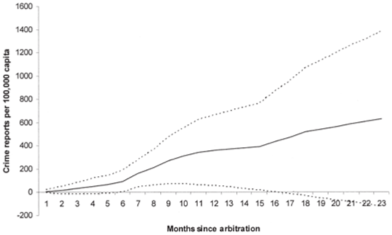

Figure: Cumulative Effect of Union Losses on Crime

- There were more than 600 excess crime reports per 100,000 capita in Employer cities in the 23 months after arbitration

The Nature of Risk Preferences: Evidence from Insurance Choices (Barseghyan et al., 2013)

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- What preferences do consumers exhibit when facing downside risk situations?
- Are households' deductible choices influenced by probability weighting?

The Nature of Risk Preferences: Evidence from Insurance Choices (Barseghyan et al., 2013)

- Data from large US insurance company.
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  - 1998-2006

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    - Policies

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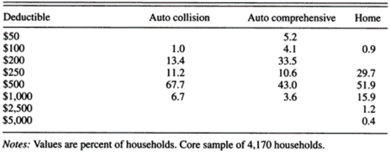

Deductible	Auto collision	Auto comprehensive	Home
$50		5.2	
$100	1.0	4.1	0.9
$200	13.4	33.5	
$250	11.2	10.6	29.7
$500	67.7	43.0	51.9
$1,000	6.7	3.6	15.9
$2,500			1.2
$5,000			0.4

Notes: Values are percent of households. Core sample of 4,170 households.

Figure: Deductible choices

- Deductible choices: Most households choose $500.

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- Premiums vary across households ⇒ company determines price based on regulations and household ratings.

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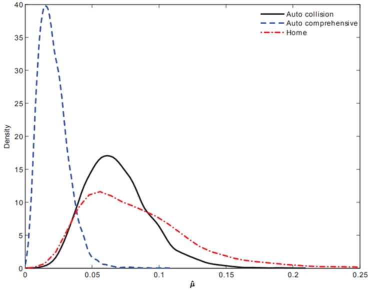

Figure: Estimated probabilities

	Mean	SD	1st percentile	99th percentile
Auto collision premium for $500 deductible	180	100	50	555
Auto comprehensive premium for $500 deductible	115	81	26	403
Home all perils premium for $500 deductible	679	519	216	2,511
Cost of decreasing deductible from $500 to $250:				
Auto collision	54	31	14	169
Auto comprehensive	30	22	6	107
Home all perils	56	43	11	220
Savings from increasing deductible from $500 to $1,000:				
Auto collision	41	23	11	127
Auto comprehensive	23	16	5	80
Home all perils	74	58	15	294

Notes: Annual amounts in dollars. Core sample of 4,170 households.

Figure: Premium Menus

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- Under Prospect Theory, households' preference over deductible choices are:

$$PT = \big(1 - \Omega^{-}(\mu)\big)u(-p_d) + \Omega^{-}(\mu)u\big(-p_d - d\big)$$

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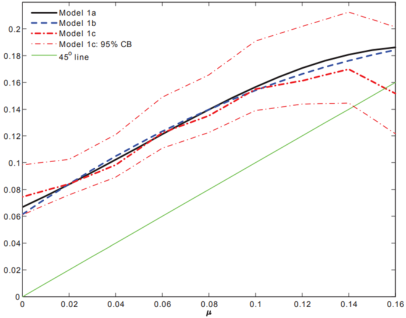
The Nature of Risk Preferences: Evidence from Insurance Choices (Barseghyan et al., 2013)

- Analysis with homogeneous preferences:
  - $\Omega^{-}(\mu)$ are the same for all households
  - Probability overweighting for small probabilities of calamities.



The Nature of Risk Preferences: Evidence from Insurance Choices (Barseghyan et al., 2013)

	(1)	(2)	(3)	(4)	(5)
Standard risk aversion	$r = 0$	$r = 0.00064$	$r = 0$	$r = 0.00064$	$r = 0.0129$
Probability distortions?	No	No	Yes	Yes	No
μ	WTP	WTP	WTP	WTP	WTP
0.020	10.00	14.12	41.73	57.20	33.76
0.050	25.00	34.80	55.60	75.28	75.49
0.075	37.50	51.60	67.30	90.19	104.86
0.100	50.00	68.03	77.95	103.51	130.76
0.125	62.50	84.11	86.41	113.92	154.00

Notes: WTP denotes—for a household with claim rate μ, the utility function in equation (2), and the specified utility parameters—the household's maximum willingness to pay to reduce its deductible from $1,000 to $500 when the premium for coverage with a $1,000 deductible is $200. Columns 3 and 4 use the probability distortion estimates from Model 1a.

Figure: Economic Significance

Columns 3 and 4 reveal that probability weighting has a large economic impact.

Exam-like question

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- Last Tuesday, Marloes booked a flight for her next vacation. The ticket cost 150 Euro and she decided to buy an insurance. She thought she might miss the flight with probability 10% and the insurance cost 16 Euro. The insurance will reimburse 150 Euro if she misses the flight. In the evening, she went to Holland Casino and bet 5 Euro on numbers 4, 5 and 6 at a Roulette table. (A roulette gives a number between 0 and 36, with equal probability.) The ball fell on 4 and she received 60 Euro (inclusive the 5 Euro she bet).

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  - Did she use Expected Utility (EU) with a concave utility in both decision? Why?

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    - Did she use Expected Utility (EU) with a concave utility in both decision? Why?
    - Which model could explain her behavior? How?

The End!

Today's recommendation

Today's recommendation

- Fatoumata Diawara's "Fatou" (2011).
- "a wondrous work of cultural preservation from one of the biggest names in contemporary African music" —The economist