

Johnson 1993 et al.

**Econ 339 - Behavioral
Economics**

Fall 2026



- ◇ **Take-Home Quiz 2**
 - ▶ Grading according to a rubric (should be visible on Blackboard). Should be done end of week, and sorry for the delay!
- ◇ Exam 1 solutions are posted. For short answers, remember there was a range of full-credit answers.
- ◇ (Optional) part 1 of your final project due Wednesday at midnight on Blackboard.
 - ▶ Please only 1 person per group submit. I will print these and grade any submissions manually.
 - ▶ I will indicate approximately what grade your submission would receive with feedback.

- ◇ Take-Home Quiz 3 is posted and due next Monday. (Prospect Theory Numerical Problem)
 - ▶ Please complete on paper.
 - ▶ Due at the start of class next Monday.

- ◇ Exam 2: 11/18 in class. Same format, likely harder.
- ◇ Review Class: 11/16.
- ◇ **Class Canceled: Monday, 11/30.**
 - ▶ Make-up Activity: Read the rest of Nudge over Thanksgiving Break. Write a 1-page double-spaced summary of the book due Monday 12/7 (Take-Home Quiz 3a).

- ◇ Learned risk preferences and prospect theory.
 - ▶ Kahneman and Tversky 1992 adds very minor details to Kahneman and Tversky 1977. (Read only if interested!)
 - ▶ In particular, we learned how subjective probabilities do not always match objective probabilities.
 - Subjects overweight small, and underweight large, probabilities.
 - ▶ We also know framing can affect people's choices.
 - Defaults.
 - Framing as gains versus losses.

- ◇ We want to apply behavioral economics to real policy, not just learn the theory.
- ◇ Insurance markets often deal with low-probability events.
- ◇ **Questions:**
 - ▶ Is behavior in insurance markets consistent with prospect theory?
 - ▶ How do insurance markets use framing to affect consumers' choices in an insurance market?
 - ▶ What other factors might affect consumers' insurance decisions?

- ◇ People behave consistently with the predictions of prospect theory (and inconsistently with the predictions of a standard model).
- ◇ Loss-aversion framing does affect people's choices in the lab (and therefore seems to also explain real-world decisions).
- ◇ Prospect Theory seems to improve our ability to predict actual decisions over using the standard model.

- ◇ **Availability Bias:** People estimate probabilities based on how easily a situation comes to mind.
- ◇ **Inclusion** (in insurance): WTP for a multi-part policy should be greater than or equal to the sum of WTP for insurance on each part.
- ◇ **Anchoring Bias:** An initial number, even an arbitrary one, pulls estimates or values towards it.
- ◇ **Status Quo Bias:** People stick to what they have.

Background on Insurance (Standard Model)

- ◇ Suppose house is worth \$100,000.
- ◇ 1% chance of fire (-\$100,000).
- ◇ 99% chance of no fire (0).
- ◇ Expected loss: $0.01 \times \$100,000 = \$1,000$
- ◇ Question: how much insurance should a risk-averse person buy?

Actuarially Fair Insurance

- ◇ Buy $\$C$ of coverage: if the house burns, insurer pays $\$C$.
- ◇ **Actuarially fair**: premium = expected payout.
 - ▶ Each \$1 of coverage costs \$0.01.
 - ▶ Insurer breaks even on average.
- ◇ Full coverage ($C = \$100,000$) costs \$1,000.
- ◇ Key point: buying insurance does *not* change expected wealth. It only moves money from the good state to the bad state.

Comparing Choices

	No Fire (99%)	Fire (1%)	Expected Wealth
No insurance	\$100,000	\$0	\$99,000
Half coverage	\$99,500	\$49,500	\$99,000
Full coverage	\$99,000	\$99,000	\$99,000

- ◇ Every option has the **same expected wealth**.
- ◇ More coverage means **less risk**.
- ◇ A risk-averse person prefers the option with no risk: full coverage.

Example: $u(w) = \sqrt{w}$

	Expected Utility
No insurance	$0.99\sqrt{100,000} + 0.01\sqrt{0} = 313.07$
Half coverage	$0.99\sqrt{99,500} + 0.01\sqrt{49,500} = 314.51$
Full coverage	$\sqrt{99,000} = 314.64$

- ◇ Full coverage gives the highest expected utility.
- ◇ Being uninsured is worth the same as a sure \$98,010.
- ◇ So this person would pay up to $\approx$ \$1,990 for full coverage, roughly twice the fair price.

Takeaways from the Standard Model

- ◇ With fair prices, a risk-averse person buys **full insurance**.
- ◇ This holds for *any* concave utility function, not just $\sqrt{w}$.
- ◇ Only probabilities and dollar amounts matter.
 - ▶ How the policy is *described* should not matter.
 - ▶ The *cause* of the loss should not matter.
- ◇ Johnson et al. (1993): real insurance choices break these predictions.
 - ▶ Loss-aversion, overweighting small probabilities, framing.

- ◇ Double indemnity: Payout double if the accident leads to death. (Insurance term).
- ◇ Interpret quote on page 4.

New Madrid Earthquake Panic: Actual Headlines

- ◇ Earthquake possibility scares some students from Missouri.
- ◇ Residents poke fun, prepare for 'quake'.
 - ▶ Some companies stopped selling/sold-out of earthquake coverage.

Study 1: Flight Insurance (Table 1)

- ◇ Suppose \$100,000=value of statistical life and wealth of \$150,000.
- ◇ Terrorism odds: 1 in 20M.
- ◇ Mechanical-reason: 1 in 8M.
- ◇ Any: 1 in 4M.

Coverage	Assumed Prob.	Fair Premium	Risk-averse WTP	Observed WTP
Any reason	1 in 4M	\$0.03	\$0.08	\$12.03
Mechanical	1 in 8M	\$0.01	\$0.04	\$10.31
Terrorism	1 in 20M	\$0.01	\$0.02	\$14.12

Study 2: Hospital Insurance (Table 2)

Coverage	Fair Premium	Observed WTP
Any disease, then any accident	$\approx \$75$	\$89.10
Any accident, then any disease	$\approx \$75$	\$69.55
Any disease or accident	$\approx \$75$	\$47.12
Any reason	$\approx \$79$	\$41.53

Fair premium: $\$100 \times$ expected hospital days per person per year (124 stays per 1,000 $\times$ 6.4 days; NCHS 1990 National Hospital Discharge Survey), all ages, excluding childbirth where relevant; working-age rates are lower. Accident $\approx \$6$, disease $\approx \$69$ assuming injuries are $\sim 8\%$ of stays.

- ◇ “Disease or accident” covers *every* case the other two cover.
- ◇ Standard model: it must be worth the most.
- ◇ Observed: it is worth the *least*.
- ◇ Accident coverage valued at roughly $12\times$ the prediction.

Study 2: Alternative Version of the Table

Coverage	Share of Hospital Days	Predicted WTP	Observed WTP
Any reason	100%	\$41.53	\$41.53
Any disease or accident	$\approx 94\%$	$\approx \$39$	\$47.12
Disease, then accident (total)	$\approx 94\%$	$\approx \$39$	\$89.10
Accident, then disease (total)	$\approx 94\%$	$\approx \$39$	\$69.55

Study 2 Questions

- ◇ Why do the authors say anchoring effect worked against their hypothesis?
- ◇ Why did the two groups answer the questions in the opposite order of the first two groups?

Terrorism Insurance for a Trip to Thailand (1991)

Coverage	Predicted WTP	Observed WTP
<i>Panel A: Flight insurance</i>		
Flight US → Thailand	≈\$6.95	\$13.63
Flight Thailand → US	≈\$6.95	\$17.19
Sum of legs	\$13.90	\$30.82
Round trip	\$13.90	\$13.90
<i>Panel B: Travel insurance</i>		
Flight terrorism	sum ≤ \$7.44	\$7.42
Ground terrorism		\$9.00
Sum of parts	\$7.44	\$16.42
Complete terrorism	\$7.44	\$7.44

- ◇ The parts are non-overlapping pieces of the whole trip, so they should add up to the inclusive policy.
- ◇ Splitting the trip into pieces more than doubles the total price.

Table 4: Framing and Insurance Vocab

- ◇ Premium: Amount you pay for your insurance each period.
- ◇ Deductible: Money you must pay out of pocket before insurance kicks in.
- ◇ Co-pay: Not a deductible, per-use payment insurance does not cover.
- ◇ Rebate: Lowering of insurance payments.
- ◇ Moral Hazard: Insurance company cannot observe behavior.

Table 4: Framing Insurance Policies

- ◇ Total cost is identical for every possible claim amount.
- ◇ If anything, the rebate is *worse*: it is a \$600 interest-free loan to the insurer.
- ◇ Standard model: the rebate policy should never be more popular.

Deductible vs. Rebate: Same Policy, Different Frame

Claims in the Year	Deductible Frame \$1,000 premium, \$600 deductible	Rebate Frame \$1,600 premium, \$600 minus claims back
\$0	$\$1,000 + \$0 = \$1,000$	$\$1,600 - \$600 = \$1,000$
\$300	$\$1,000 + \$300 = \$1,300$	$\$1,600 - \$300 = \$1,300$
\$600	$\$1,000 + \$600 = \$1,600$	$\$1,600 - \$0 = \$1,600$
\$5,000	$\$1,000 + \$600 = \$1,600$	$\$1,600 - \$0 = \$1,600$
Would buy	44.3%	67.8%

Table 5 Disability Policies & Status Quo Effect

- ◇ Same coverage. Best case for A: you break even with B, five years later.
- ◇ The \$1,200 “rebate” is a 5-year, zero-interest loan to the insurer.
- ◇ Buy B and save \$20/month at 5%: about \$1,360 after 5 years.
- ◇ Subjects would pay \$21.65/month extra for A, which implies a *negative* interest rate.

Table 5: Disability Policies

	Policy A (Rebate)	Policy B (No Rebate)
Monthly premium	\$90	\$70
Premiums over 5 years	\$5,400	\$4,200
<i>No claim in 5 years</i>	$\$5,400 - \$1,200 = \$4,200$	\$4,200
<i>File a claim</i>	No refund: \$20/month more	—
Preferred by	57%	43%

- 1 If the government knows people tend to overpay for insurance against small-probability events, should the government regulate these types of insurance in any way?
- 2 In some parts of the US, Flood Insurance is required. How could the government frame flood insurance in a way that nudges homeowners to buy flood insurance, rather than using a carrot-stick policy?
- 3 If defaults matter so much for decision-making, should the government regulate defaults? In all situations? Only in specific situations?