14.73: Recitation 6

Insurance

Mikey Jarrell

MIT

October 21, 2022

Admin stuff
○○

Punctuation
○○○○

Risk
○○

Insurance on Paper
○○○○○

Insurance in Reality
○○○○○

References

Today's plan: Insurance

1 Admin stuff

2 Punctuation

3 Risk

4 Insurance on Paper

5 Insurance in Reality

Essay 1

- Final draft due Thursday, October 27 at 8:00 pm.
- If it is uploaded to Canvas at 8:00:01, you get a 0.

Making sure we understand this table from class: Jayachandran (2006)

TABLE 3
BANKING AND THE ELASTICITY OF THE WAGE
Dependent Variable: Log Agricultural Wage, 1956–87

| | MEASURE OF BANKING | | |
	Bank Deposits per Capita (1)	Bank Credit per Capita (2)	Bank Branches per Capita (3)
Log crop yield	.162**	.158*	.138*
	(.083)	(.083)	(.082)
Banking			−.049**
			(.021)
Log crop yield ×	−.091**	−.075*	−.033*
Banking	(.036)	(.044)	(.019)
Observations	7,678	7,614	8,080
District and year fixed effects?	Yes	Yes	Yes

There are three different dashes.

- Hyphens: -
- En-dashes: –
- Em-dashes: —

Hyphen: -

- How to use
  - Compound words: *double-dipping*.
  - Compound modifiers: *sharp-dressed man*.
    - But not if the modified noun precedes the modifier: *the man is sharp dressed*.
    - Or if the adverb is "very" or "-ly:" *the sharply dressed man*.
- How to type
  - Just the hyphen key on your keyboard.
- How to format
  - No spaces.

En-dash: –

- How to use
    - Ranges: *2–4, Monday–Friday*.
    - Connections/relationships: *My dad and I took the Boston–New York flight to watch the Celtics–Knicks game. The score was 101–95. It was a a great father–son experience.*
    - Compound compounds: *Esther and Abhijit are a Nobel Prize–winning couple.*
- How to type
    - On Mac: `OPTION + -`
    - On Windows: `ALT + 0150`
    - On Windows in Microsoft Word: `CTRL + -`
    - In LaTeX: two hyphens.
- How to format
    - No spaces.

Admin stuff
00

Punctuation
000●

Risk
00

Insurance on Paper
00000

Insurance in Reality
00000

References

Em-dash: —

- How to use
  - Lists (instead of a colon): *I have three sisters — Monica, Erica, and Rita.*
  - Asides (instead of parentheses or commas): *This is a good — but stupid — example.*
  - Full sentences (instead of a semi-colon): *I know a boy — his name is Sue.*
  - Interrupting/changing topics (instead of ellipses): *I was going to — well, never mind.*
- How to type
  - On Mac: `OPTION + SHIFT + -`
  - On Windows: `ALT + 0151`
  - On Windows in Microsoft Word: `CTRL + SHIFT + -`.
  - In LaTeX: three hyphens.
- How to format: up for debate!
  - Chicago Manual of Style says no spaces—like this.
  - But the New York Times uses spaces — like this — on either side of em-dashes.

Would you rather take the coin flip or the sure thing?

- Scenario 1
    - Coin flip: heads you get $100, tails you get $0.
    - Sure thing: $40 guaranteed.
- Scenario 2
    - Coin flip: heads you get $100, tails you get $0.
    - Sure thing: $50 guaranteed.
- Scenario 3
    - Coin flip: heads you get $100, tails you get $0.
    - Sure thing: $60 guaranteed.

How do we figure out the "rational" choice?

- **Expected value**.
    - Coin flip: $\$100 * 50\% + \$0 * 50\% = \$50$
    - Sure thing: $\$40 * 100\% = \$40$
- **Certainty equivalent**: lowest price at which you'd prefer sure thing.
- If your certainty equivalent is...
    - $<$ expected value, you're **risk averse**;
    - $=$ expected value, you're **risk neutral**;
    - $>$ expected value, you're **risk loving**.

Let's take home fire insurance as an example. How does it work?

- Pay small fee to insurance company.
- What happens if your house burns down?
    - Insurance company checks for fraud.
    - If no fraud, they give you a pre-specified payout.
- What happens if your house never burns down?

How much should the insurance company charge?

- Assume...
    - 1% of houses burn down per year;
    - all houses are worth $100,000;
    - insurance company is risk neutral.
- Costs:
    - **Actuarially fair value**: $\$100,000 * 1\% = \$1,000$ per house per year
    - Fraud investigations
    - ...?

Admin stuff
00

Punctuation
0000

Risk
00

Insurance on Paper
00●00

Insurance in Reality
00000

References

How much should you pay for insurance?

- If you are risk neutral, exactly $1,000.
- But insurance costs more than that.
- So why buy it?
    - Risk aversion
    - Loss aversion
    - Diminishing marginal utility of wealth
    - Poverty trap?
    - Don't have $100,000 lying around!

Another example: weather index insurance

- Farming: "coin flip"
    - Heads: good harvest — you get $100.
    - Tails: flood — you get $0.
- Insurance: "sure thing"
    - Pay $50 to the insurance company at the start of the season.
    - If good harvest (heads), you get: $100 - $50 = 50.
    - If flood (tails), insurance company pays out, so you get: $100 - $50 = 50.
    - Same thing!

Admin stuff
oo

Punctuation
oooo

Risk
oo

Insurance on Paper
ooooo●

Insurance in Reality
ooooo

References

Wellfare index insurance should be wellfare enhancing!

- Farmer's willingness to pay
  - Farmer is risk averse: assume certainty equivalent is $40.
  - How much should they pay to guarantee $40 every time?
  - Harvest revenue minus certainty equivalent.
  - $100 − $40 = $60.
  - Wellfare gain = willingness to pay − price.
- Insurance companies are risk neutral.
  - Profit: price minus actuarially fair value minus administrative costs.
  - Assume administrative costs are $5 per farm.
  - $\pi = P − \$50 − \$5 = P − \$55$.
- Can we find a win–win? If $\$55 < P < \$60$...
  - Farmer gains welfare over coin flip.
  - Insurance company profits.

Admin stuff
oo

Punctuation
oooo

Risk
oo

Insurance on Paper
ooooo

Insurance in Reality
●oooo

References

Aggregate Shocks, i.e., Correlated Risks

- Suppose: one insurance company, one village.
- What happens if drought? Flood? Locusts? Frogs? Death of firstborn sons? Other biblical plagues?
- Solutions
    - Diverse geographic area
    - Savings
    - ... [1]

---
[1]What advantage does formal insurance (a big company) have over informal insurance (you and your neighbor agree to help each other out in case of bad harvests) at mitigating aggregate shocks?

Moral Hazard

Once you get insurance, will you be lazy or do you have good *morals*?

- Solutions
    - Fraud investigation
    - Objective measures
    - **Incomplete insurance**: less than 100% coverage
    - ...

Adverse Selection

Who is most likely to *select* into buying insurance?

- Solutions
  - Force everybody in
  - Incomplete insurance
  - ...

People just don't like insurance.

Aggregate shocks, moral hazard, and adverse selection: problems for *insurance company*, not farmer. Solution: higher prices? Even at low prices (*better* than fair!), people still don't want it. Why not?

- Liquidity constraints.
    - From class: Bundle loan with insurance (Karlan et al. 2014).
    - More evidence: RCT increased take-up in Kenya from 5% to 72% if they let farmers pay *after* harvest (Casaburi and Willis 2018).
- Thinking about bad things.
- Procrastination ("present bias").
- Trust.
    - From class: if I got a payout the first year, I want insurance next year (Cai, Janvry, and Sadoulet 2016).

Conclusion: Insurance is tricky to get right.

Why *should* people want insurance?

- Risk aversion, loss aversion, diminishing marginal utility, credit constraints.
- Insurance company doesn't face same problems, can pool risk even better than informal insurance.
- Can be simultaneously wellfare enhancing for farmers, profitable for insurance company.

Why don't they?

- Expensive or not offered: aggregate shocks, moral hazard, adverse selection.
- Even if cheap: present bias, liquidity constraints, mistrust/distrust.

How do we fix this? 🤷🏻‍♂️

Admin stuff
oo
Punctuation
oooo
Risk
oo
Insurance on Paper
ooooo
Insurance in Reality
ooooo
References

References I

📄 Cai, Jing, Alain de Janvry, and Elisabeth Sadoulet (Sept. 2016). *Subsidy Policies and Insurance Demand*. Working Paper. DOI: 10.3386/w22702. URL: https://www.nber.org/papers/w22702 (visited on 10/20/2022).

📄 Casaburi, Lorenzo and Jack Willis (Dec. 2018). "Time versus State in Insurance: Experimental Evidence from Contract Farming in Kenya". en. In: *American Economic Review* 108.12, pp. 3778–3813. ISSN: 0002-8282. DOI: 10.1257/aer.20171526. URL: https://pubs.aeaweb.org/doi/10.1257/aer.20171526 (visited on 10/20/2022).

📄 Jayachandran, Seema (June 2006). "Selling Labor Low: Wage Responses to Productivity Shocks in Developing Countries". en. In: *Journal of Political Economy* 114.3, pp. 538–575. ISSN: 0022-3808, 1537-534X. DOI: 10.1086/503579. URL: https://www.journals.uchicago.edu/doi/10.1086/503579 (visited on 10/20/2022).

Admin stuff

Punctuation

Risk

Insurance on Paper

Insurance in Reality

References

References II

📄 Karlan, Dean et al. (May 2014). "Agricultural Decisions after Relaxing Credit and Risk Constraints". en. In: *The Quarterly Journal of Economics* 129.2, pp. 597–652. ISSN: 0033-5533, 1531-4650. DOI: 10.1093/qje/qju002. URL: https://academic.oup.com/qje/article/129/2/597/1867065 (visited on 10/21/2022).