Economics 101A
(Lecture 26)

Stefano DellaVigna

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Outline

1. Hidden Type (Adverse Selection)
2. Empirical Economics: Intro
3. Empirical Economics: Home Insurance
4. Empirical Economics: Retirement Savings
5. Some Advice
6. Course Evaluation

1 Hidden Type (Adverse Selection)

- Nicholson, Ch. 18, pp. 671-672

- Solution of Take-over game
  - When does seller sell? If bid profitable ($b \geq V$)
  - Profit of buyer? $1.5V - b$ –> BUT: Must take into account strategic behavior of seller

- Solution:

$$
\begin{aligned}
& E[profit(b)] = (E[1.5V|V \leq b] - b) \cdot \Pr(V \leq b) \\
= & \left(1.5\frac{b}{2} - b\right) \Pr(V \leq b) \\
= & -.25b \Pr(V \leq b)
\end{aligned}
$$

- Solution: $b^* = 0$!

- No market for take-overs, despite clear benefits. Why?

- First type of asymmetric information problems: Hidden Action (Moral Hazard)
  - Manager can shirk when she is supposed to work hard.

- Second type of asymmetric information problems: Hidden Type (Adverse Selection)
  - Informational problem: one party knows more than the other party.
  - Example 1: wisdom teeth extraction (Doctors are very prone to recommend extraction. Is it necessary? Or do they just want to make money. Likely too many wisdom teeth extracted.)
  - Example 2: finding a good mechanic. (Most people don't have any idea if they are being told the truth. People can shop around, but this has considerable cost. Because of this, mechanics can sometimes inflate prices)

- **Lemons Problem**

- Classic asymmetric information situation is called "Lemons Problem"
  - (Akerlof, 1970) on used car market
  - Idea: "If you're so anxious so sell to me do I really want to buy this?"

- Simple model:
  - The market for cars has two types, regular cars (probability q) and lemons (probability $1 - q$).
    - To seller, regular cars are worth \$1000, lemons are worth \$500.
    - To potential buyer, regular cars are worth \$1500 and lemons worth \$750.

- Which cars should be sold (from efficiency perspective)?
  - All cars should be sold since more valuable to buyer.
  - BUT: buyers **do not know** type of car, sellers **do know**
- Solve in two stages (backward induction):
  - Stage 2: Determine buyers willingness to pay
  - Stage 1: Determine selling strategy of sellers
- Stage 2. What are buyers' WTP?
  - Expected car value $= \mu 1500 + (1 - \mu)750 = 750 + \mu 750$
  - Notice: μ is expected probability that car sold is regular (can differ from p)

- Buyer willing to pay up to $p = 750 + \mu 750$

- Stage 1. Seller has to decide which car to sell
  - Sell lemon if $500 \leq p = 750 + \mu 750$ YES for all μ
  - Sell regular car if $1000 \leq p = 750 + \mu 750 \Leftrightarrow \mu \geq 1/3$

- Two equilibria
  1. If $q \geq 1/3$: *Sell both types of cars* –> $\mu = q \geq 1/3$ –> $p^* = 750 + \mu 750$
  2. If $q < 1/3$: *Sell only lemons* –> $\mu = 0$ –> $p^* = 750$

- Market for cars can degenerate: Only lemons sold

- *Conclusion*: the existence of undetectable lemons may collapse the market for good used cars

- *Basic message*: If sellers know more than buyers, buyers must account for what a seller's willingness to trade at a price tells them about hidden information

- Same issues apply to:
  - *Car Insurance.* If offer full insurance, only bad drivers take it
  - *Salary.* If offer no salary incentives, only low-quality workers apply

2 Empirical Economics: Intro

- So far we have focused on economic models

- For each of the models, there are important empirical questions

- **Consumers**:
  - Savings decisions: Do Americans under-save?
  - Attitudes toward risk: Should you purchase earthquake insurance?
  - Self-control problems: How to incentive exercise to address obesity 'epidemics'?
  - Preferences: Does exposure to violent media change preferences for violent behavior?

- **Producers:**
  - When do market resemble perfect competition versus monopoly/oligopoly?
  - Also, what if market pricing is more complicated than just choice of price and quantity p?

- But this is only half of economics!

- The other half is empirical economics

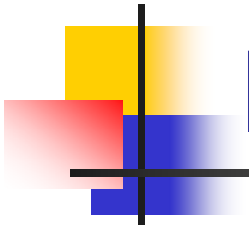
- Creative and careful use of data

- Get empirical answers to questions above (and other questions)

3 Empirical Economics: Home Insurance

Methodology I. Consumers choose in a menu of options –> Choice among options reveals preferences

- Choice of deductibles in home insurance (Sydnor, 2006)
- Risk Aversion –>Take insurance to limit risks
- However: Limit *large* risks, not small risks (Local risk-neutrality)
  - Insure house at all (large) vs. deductible at $250 or $500 (small)
  - Invest in stock market (large) vs. telephone wire insurance (small)



Dataset

- 50,000 Homeowners-Insurance Policies
  - 12% were new customers
- Single western state
- One recent year (post 2000)
- Observe
  - Policy characteristics including deductible
    - 1000, 500, 250, 100
  - Full available deductible-premium menu
  - Claims filed and payouts by company

Premium-Deductible Menu

Available Deductible	Full Sample
1000	$615.82 (292.59)
500	+99.91 (45.82)
250	+86.59 (39.71)
100	+133.22 (61.09)

* Means with standard deviations in parentheses

Risk Neutral Claim Rates?

100/500 = 20%

87/250 = 35%

133/150 = 89%

Potential Savings with 1000 Ded

Claim rate?

Value of lower deductible?

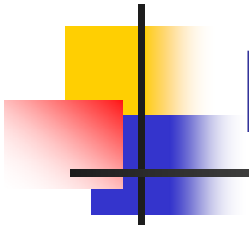
Additional premium?

Potential savings?

Chosen Deductible	Number of claims per policy	Increase in out-of-pocket payments *per claim* with a $1000 deductible	Increase in out-of-pocket payments *per policy* with a $1000 deductible	Reduction in yearly premium per policy with $1000 deductible	Savings per policy with $1000 deductible
$500	0.043	469.86	19.93	99.85	79.93
N=23,782 (47.6%)	(.0014)	(2.91)	(0.67)	(0.26)	(0.71)
$250	0.049	651.61	31.98	158.93	126.95
N=17,536 (35.1%)	(.0018)	(6.59)	(1.20)	(0.45)	(1.28)

Average forgone expected savings for all low-deductible customers: $99.88

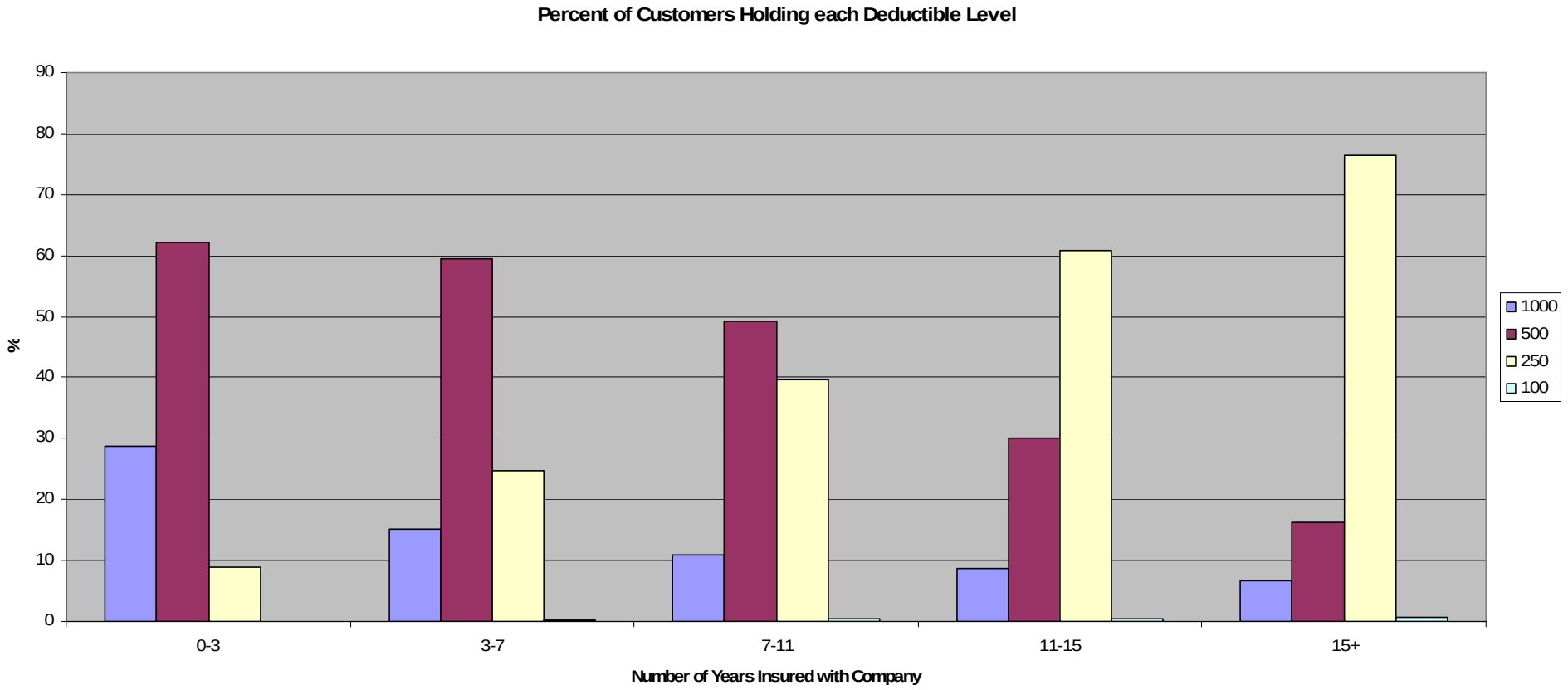
* Means with standard errors in parentheses



Back of the Envelope

- BOE 1: Buy house at 30, retire at 65, 3% interest rate $\Rightarrow$ \$6,300 expected
  - With 5% Poisson claim rate, only 0.06% chance of losing money
- BOE 2: (Very partial equilibrium) 80% of 60 million homeowners could expect to save \$100 a year with “high” deductibles $\Rightarrow$ \$4.8 billion per year

Consumer Inertia?



Risk Aversion?

- Simple Standard Model
  - Expected utility of wealth maximization
  - Free borrowing and savings
  - Rational expectations
  - Static, single-period insurance decision
  - No other variation in lifetime wealth

CRRA Bounds

	Measure of Lifetime Wealth (W): (Insured Home Value)		
Chosen Deductible	W	min ρ	max ρ
$1,000	256,900	- infinity	794
N = 2,474 (39.5%)	{113,565}		(9.242)
$500	190,317	397	1,055
N = 3,424 (54.6%)	{64,634}	(3.679)	(8.794)
$250	166,007	780	2,467
N = 367 (5.9%)	{57,613}	(20.380)	(59.130)

4 Empirical Economics: Retirement Savings

- **Methodology II.** Differences-in-differences
  - Consider effect of a change in variable x on variable y
  - Ex.: Minimum wage (x) and employment (y) (Card and Krueger, 1991)

- Retirement Savings – In the US, most savings for retirement are voluntary (401(k))

- Actively choosing to save is... hard

- Self-control problems: Would like to save more... Just not today!

- Saving 10% today means lower net earnings today

- Brilliant idea: SMRT Plan (Benartzi and Thaler, 2005) Offer people to save... tomorrow.

- Three components of plan:

  1. Retirement contribution to 401(k) increases by 3% at every future wage increase

  2. This is just default – can change at any time

  3. Contribution to 401(k) goes up only when wage is increased

- This works around your biases to make you better off:

  1. **Self-control problem.** Would like to save more, not today

  2. **Inertia.** People do not change the default

  3. **Aversion to nominal (not real) losses.**

- The results...

- Setting:
  - Midsize manufacturing company
  - 1998 onward

TABLE 1
PARTICIPATION DATA FOR THE FIRST IMPLEMENTATION OF SMART

Number of plan participants prior to the adoption of the SMarT plan	315
Number of plan participants who elected to receive a recommendation from the consultant	286
Number of plan participants who implemented the consultant's recommended saving rate	79
Number of plan participants who were offered the SMarT plan as an alternative	207
Number of plan participants who accepted the SMarT plan	162
Number of plan participants who opted out of the SMarT plan between the first and second pay raises	3
Number of plan participants who opted out of the SMarT plan between the second and third pay raises	23
Number of plan participants who opted out of the SMarT plan between the third and fourth pay raises	6
Overall participation rate prior to the advice	64%
Overall participation rate shortly after the advice	81%

- Result 1: High demand for commitment device

- Result 2: Phenomenal effects on savings rates

TABLE 2
AVERAGE SAVING RATES (%) FOR THE FIRST IMPLEMENTATION OF SMART

	Participants Who Did Not Contact the Financial Consultant	Participants Who Accepted the Consultant's Recommended Saving Rate	Participants Who Joined the SMarT Plan	Participants Who Declined the SMarT Plan	All
Participants initially choosing each option*	29	79	162	45	315
Pre-advice	6.6	4.4	3.5	6.1	4.4
First pay raise	6.5	9.1	6.5	6.3	7.1
Second pay raise	6.8	8.9	9.4	6.2	8.6
Third pay raise	6.6	8.7	11.6	6.1	9.8
Fourth pay raise	6.2	8.8	13.6	5.9	10.6

* There is attrition from each group over time. The number of employees who remain by the time of the fourth pay raise is 229.

- Plan triples savings in 4 years

- Currently offered to more than tens of millions of workers

- Law passed in Congress that gives incentives to firms to offer this plan: *Automatic Savings and Pension Protection Act*

- Psychology & Economics & Public Policy:
  - Leverage biases to help biased agents
  - Do not hurt unbiased agents (cautious paternalism)

- For example: Can we use psychology to reduce energy use?

- Summary on Empirical Economics

- Economics offers careful models to think about human decisions

- Economics also offers good methods to measure human decisions

- Starts with Econometrics (140/141)

- Then go on with applied ecomometrics (142)

- Empirical economics these days is precisely-measured social science

5 Advice

1. Listen to your heart

2. Trust yourself

3. Take ‘good’ risks:

   (a) hard courses

   (b) internship opportunities

   (c) (graduate classes?)

4. Learn to be curious, critical, and frank

5. Be nice to others! (nothing in economics tells you otherwise)