

Economics 101A

(Lecture 27)

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Outline

1. Empirical Economics: Intro
2. Empirical Economics: Home Insurance
3. Empirical Economics: Retirement Savings
4. Some Advice
5. Course Evaluation

1 Empirical Economics: Intro

- So far we have focused on economic theory
- What have we learnt (maybe)?
- Power of models
- **Consumers.** We tried to capture:
 - savings decisions (consumer today/consumer in future)
 - work-leisure trade-off (how much to work?)
 - attitudes toward risk (insurance, investment)
 - self-control problems (health club, retirement saving)
 - altruism (charitable contribution, volunteer work)

- **Producers.**
- Beauty of competitive markets:
 - price equals marginal costs
 - zero profit with entry into market
 - welfare optimality (no deadweight loss)
- Market power, the realistic scenario:
 - choice of price to maximize profits
 - single price or price discrimination
 - interaction between oligopolists

- 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)
- Different methodologies

2 Empirical Economics: Home Insurance

Methodology I. Consumers choose in a menu of options

- – Choice among options reveals preferences
 - Ex.: Health club paper (DellaVigna and Malmendier, 2006)
 - Ex. Choice of deductibles (Sydnor, 2006)
 - Fields:
 - * Consumption decisions
 - * IO
 - * Finance

- 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



Features of Contracts

- Standard homeowners-insurance policies (no renters, condominiums)
- Contracts differ only by deductible
- Deductible is *per claim*
- No experience rating
 - Though underwriting practices not clear
- Sold through agents
 - Paid commission
 - No “default” deductible
- Regulated state



Premium-Deductible Menu

<u>Available Deductible</u>	<u>Full Sample</u>
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1000	\$615.82 (292.59)
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500	+99.91 (45.82)
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250	+86.59 (39.71)
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100	+133.22 (61.09)
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Risk Neutral Claim Rates?

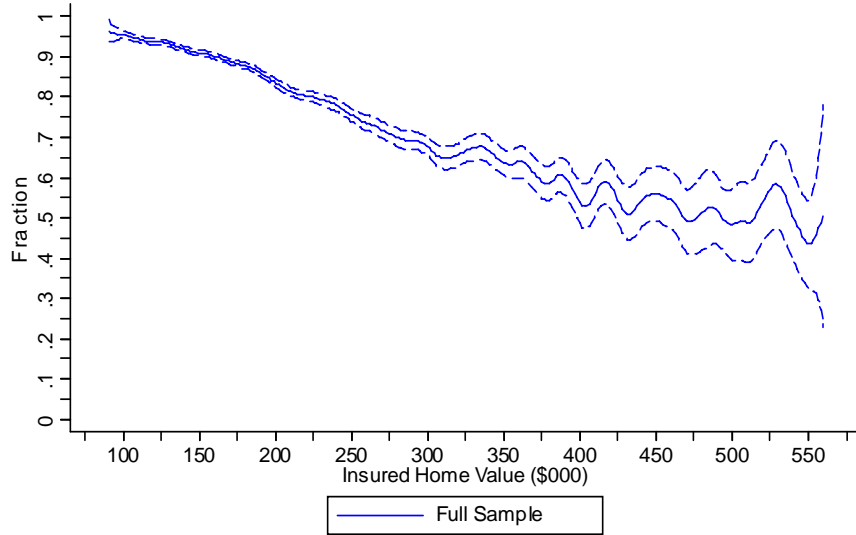
100/500 = 20%

87/250 = 35%

133/150 = 89%

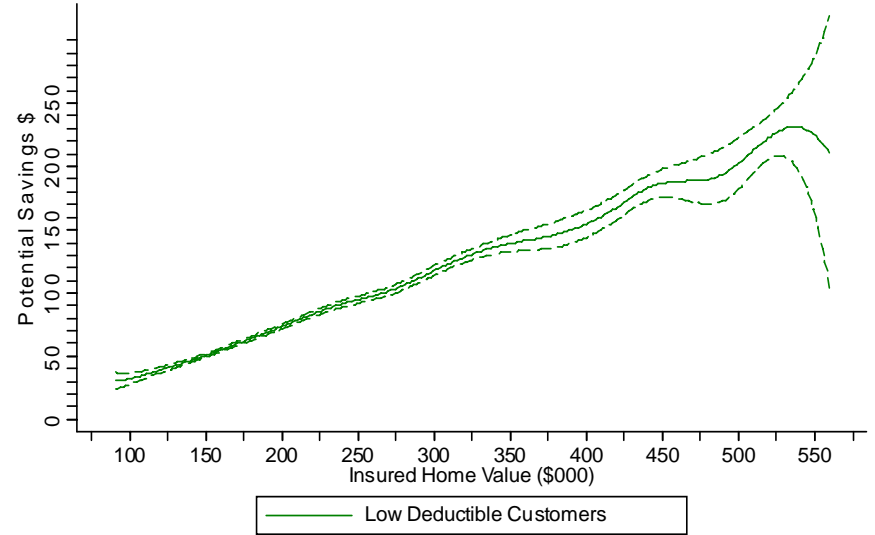
* Means with standard deviations
in parentheses

Fraction Choosing \$500 or Lower Deductible



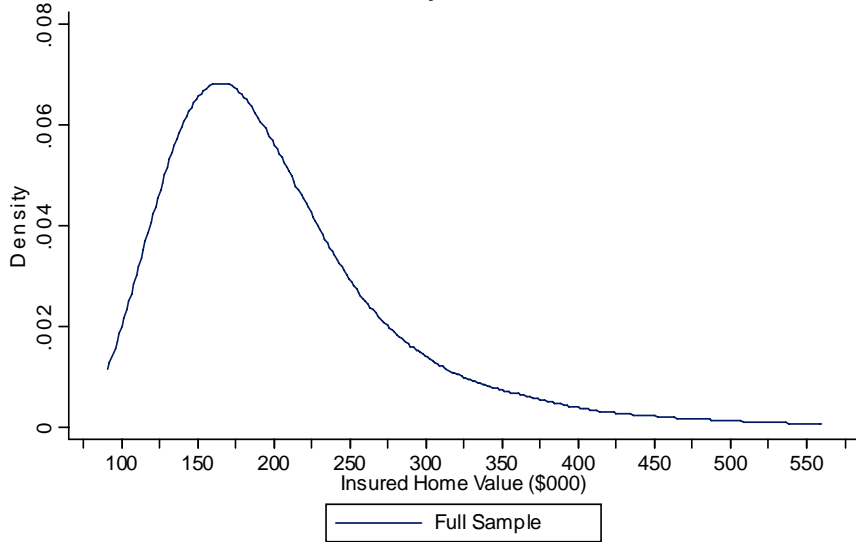
Quartic kernel, bw = 25

Potential Savings with the Alternative \$1000 Deductible



Quartic kernel, bw = 50

Kernel Density of Insured Home Value



Epanechnikov kernel, bw = 25



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

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

* Means with standard errors in parentheses

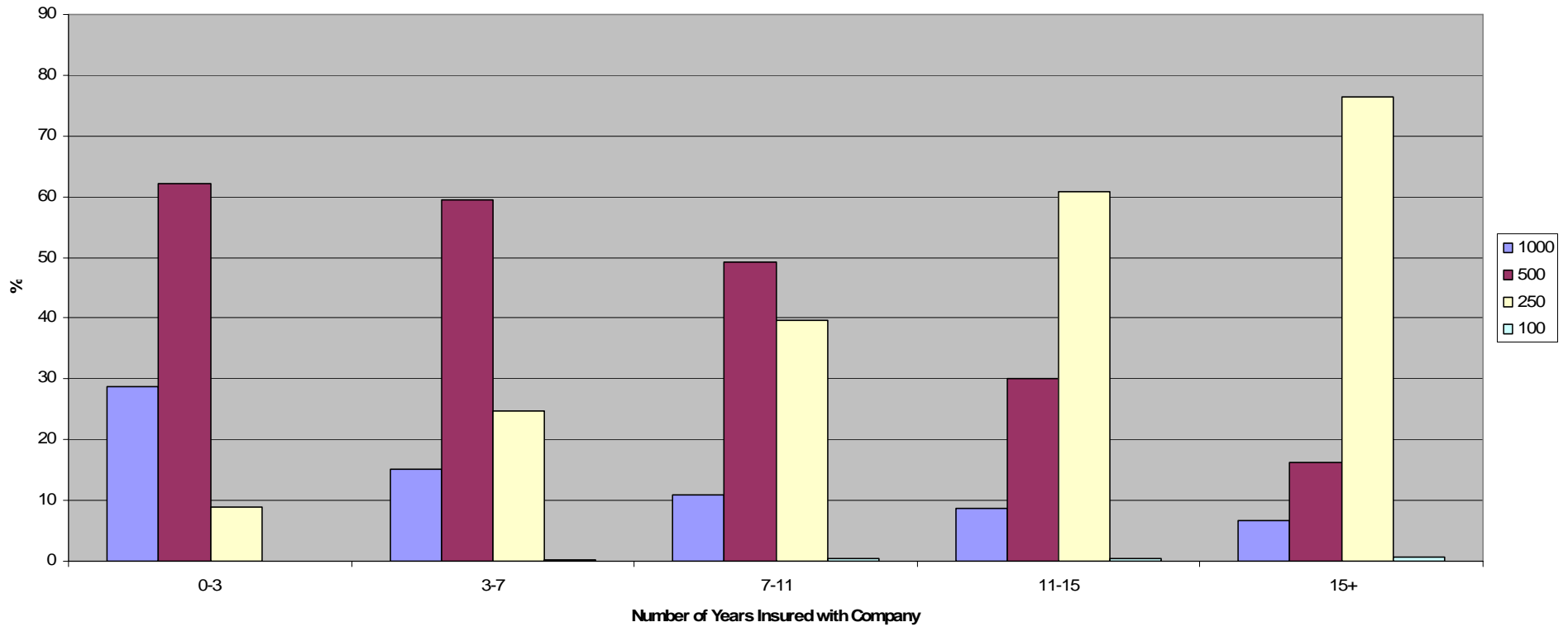


Back of the Envelope

- 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?

Percent of Customers Holding each Deductible Level





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 N = 2,474 (39.5%)	256,900 {113,565}	- infinity	794 (9.242)
\$500 N = 3,424 (54.6%)	190,317 {64,634}	397 (3.679)	1,055 (8.794)
\$250 N = 367 (5.9%)	166,007 {57,613}	780 (20.380)	2,467 (59.130)



Implications

- DMU unlikely explanation here
- Alternative model (Prospect Theory)



Choices: Observed vs. Model

Chosen Deductible	Predicted Deductible Choice from Prospect Theory NLIB Specification: $\lambda = 2.25, \gamma = 0.69, \beta = 0.88$				Predicted Deductible Choice from EU(W) CRRA Utility: $\rho = 10, W = \text{Insured Home Value}$			
	1000	500	250	100	1000	500	250	100
\$1,000 N = 2,474 (39.5%)	87.39%	11.88%	0.73%	0.00%	100.00%	0.00%	0.00%	0.00%
\$500 N = 3,424 (54.6%)	18.78%	59.43%	21.79%	0.00%	100.00%	0.00%	0.00%	0.00%
\$250 N = 367 (5.9%)	3.00%	44.41%	52.59%	0.00%	100.00%	0.00%	0.00%	0.00%
\$100 N = 3 (0.1%)	33.33%	66.67%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%



Alternative Explanations

- Misesestimated probabilities
 - $\approx 20\%$ for single-digit CRRA
 - Older (age) new customers just as likely
- Liquidity constraints
- Sales agent effects
 - Hard sell?
 - Not giving menu? (\$500?, data patterns)
 - Misleading about claim rates?
- Menu effects

3 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)
- Ex.: AIDS death of parent (x) and education of child (y) (Evans and Miguel, 2004)
- Ex.: Fox News Exposure (x) and voting behavior (y) (DellaVigna and Kaplan, 2004)
- Fields:
 - * Labor Economics
 - * Health Economics

- Retirement Savings
- In the US, most savings for retirement are voluntary (401(k))
- Actively choosing to save is... hard.
- Saving 10% today means lower net earnings today
- Self-control problems: Would like to save...
- Just not 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.**

- Incredible results: Plan triples savings in 4 years

- Currently offered to more than a million workers

- Proposed law bill that gives incentives to firms to offer this plan

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%

With the 3 percent a year increases, employees would typically reach the maximum tax-deferred contribution within four years.

Even with this aggressive strategy of increasing saving rates, the SMarT plan proved to be extremely popular with the participants. Of the 207 participants who were unwilling to accept the saving rate proposed by the investment consultant, 162 (78 percent) agreed to join the SMarT plan. More important, the majority of these participants did not change their mind once the savings increases took place. Only three participants (2 percent) dropped out of the plan prior to the second pay raise, with 23 more (14 percent) dropping out between the second and third pay raises and six more (4 percent) between the third and fourth pay raises.⁸ Hence, the vast majority of the participants (80 percent) have remained in the plan through four pay raises. Furthermore, even those who withdrew from the plan did not reduce their contribution rates to the original levels; they merely stopped the future increases from taking place. So, even these workers are saving significantly more than they were before joining the plan.

The impact of the SMarT plan on saving is shown in table 2.⁹ When

⁸ Interestingly, most of the employees who dropped out between the second and third pay raises worked for a single supervisor who apparently disapproved of the SMarT plan.

⁹ The data for each year refer only to those workers who are still employed by the company, so the sample shrinks over time from 315 to 229.

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.

the investment consultant was brought into the company, the overall savings rate in the plan was 4.4 percent. The employees who did not want to talk to the consultant were saving more than the average, 6.6 percent. The group that accepted the advice of the consultant had been saving at exactly the overall company average, 4.4 percent, and after implementing the advice, they began saving 9.1 percent of their salary. At the end of our data collection period, that rate had slipped slightly to 8.8 percent. Those who were unwilling to accept the advice were, not surprisingly, starting from a lower base of 3.5 percent and so would find the advice harder to adopt. Once they got their first pay raise, however, their saving rate jumped to 6.5 percent, and after three more raises, it was up 13.6 percent. Those participating in the SMarT plan ended up with a much higher saving rate than those who accepted the consultant's recommendation.

Of course, the implementation of the SMarT plan was not conducted as an experiment with random assignment to conditions. Participants selected themselves into the SMarT plan. In other circumstances, one might worry that the observed increase in savings rates might be attributable to some unmeasured "taste for saving" in the households that joined the SMarT plan; however, this worry seems unwarranted here on two counts. First, the SMarT participants had been saving very little before joining the plan, so one would have to believe that their taste for saving was newly acquired. Second, recall that the SMarT plan was offered only to those employees who were unwilling to increase their savings rate immediately by 5 percent. So, if anything, the group that

- 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)
- Empirical economics these days is precisely-measured social science

4 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)