Econ 219B
Psychology and Economics: Applications
(Lecture 13)

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Outline

1. Market Reaction to Biases: Introduction
2. Market Reaction to Biases: Pricing
3. Methodology: Markets and Non-Standard Behavior
4. Market Reaction to Biases: Corporate Decisions
5. Market Reaction to Biases: Employers
6. Market Reaction to Biases: Political Economy

1 Market Reaction to Biases: Introduction

- So far, we focused on consumer deviations from standard model

- Who exhibits these deviations?

  1. **Self-control and naivete'.** Consumers (health clubs, food, credit cards, smoking), Employees (retirement saving, benefit take-up), Students (homework)

  2. **Reference dependence.** Workers (labor supply, increasing wages), (inexperienced) traders (sport cards), Investors, Consumers (insurance), House owners

  3. **Social preferences.** Consumers (giving to charities), Employees (effort, strikes)

4. **Biased Beliefs.** Individual investors, CEOs, Consumers (purchases, betting)

5. **Inattention.** Individual investors, Consumers (eBay bidding, taxation)

6. **Menu Effects.** Individual investors, Consumers (loans, 410(k) plans)

7. **Social Pressure and Persuasion.** Voters, Employees (productivity), Individual investors (and analysts)

8. **Emotions.** Individual investors, Consumers

- What is missing from picture?

- Experienced agents
- Firms
- Broadly speaking, market interactions with ‘rational’ agents

- Market interactions
  - Everyone ‘born’ with biases
  - But: Effect of biases lower if:
    * learning with plenty of feedback
    * advice, access to consulting
    * specialization

* Competition ‘drives out of market’ (BUT: See last lecture)

- For which agents are these conditions more likely to be satisfied?

- Firms

- In particular, firms more likely to be aware of biases

- Implications? Study biases in the market

- Six major instances:
  - Interaction between firms and consumers (contract design, price choice)
  - Interaction between experienced and inexperienced investors (noise traders and behavioral finance)
  - Interaction between managers and investors (corporate finance)
  - Interaction between employers and employees (labor economics)
  - Interaction between politicians and voters (political economy)
  - Institutional design

2 Market Reaction to Biases: Pricing

- Consider now the case in which consumers purchasing products have biases
- Firm maximize profits
- Do consumer biases affect profit-maximizing contract design?
- How is consumer welfare affected by firm response?
- **DellaVigna and Malmendier (2004).** Consumers with $\left(\beta, \hat{\beta}, \delta\right)$ preferences

2.1 Self-Control I

MARKET (I). INVESTMENT GOODS

- Monopoly
- Two-part tariff: L (lump-sum fee), p (per-unit price)
- Cost: set-up cost K, per-unit cost a

Consumption of investment good

Payoffs relative to best alternative activity:

- Cost c at $t = 1$, stochastic
  - non-monetary cost
  - experience good, distribution $F(c)$
- Benefit $b > 0$ at $t = 2$, deterministic

FIRM BEHAVIOR. Profit-maximization

$$\max_{L,p} \delta \left\{ L - K + F\left(\beta\delta b - p\right)\left(p - a\right) \right\}$$

$$\text{s.t. } \beta\delta \left\{ -L + \int_{-\infty}^{\hat{\beta}\delta b - p} \left(\delta b - p - c\right) dF\left(c\right) \right\} \geq \beta\delta\overline{u}$$

- Notice the difference between β and $\hat{\beta}$
- Substitute for L to maximize

$$\max_{L,p} \delta \left\{ \int_{-\infty}^{\hat{\beta}\delta b - p} \left(\delta b - p - c\right) dF\left(c\right) + F\left(\beta\delta b - p\right)\left(p - a\right) - K - \beta\delta\overline{u} \right\}$$

Solution for the per-unit price p^*:

$$
\begin{aligned}
p^* \;=\; & a && \text{[exponentials]} \\
& -\left(1-\hat{\beta}\right)\delta b \frac{f\left(\hat{\beta}\delta b - p^*\right)}{f\left(\beta\delta b - p^*\right)} && \text{[sophisticates]} \\
& -\frac{F\left(\hat{\beta}\delta b - p^*\right) - F\left(\beta\delta b - p^*\right)}{f\left(\beta\delta b - p^*\right)} && \text{[naives]}
\end{aligned}
$$

Features of the equilibrium

1. *Exponential agents* ($\beta = \hat{\beta} = 1$).
   Align incentives of consumers with cost of firm
   $\Longrightarrow$ marginal cost pricing: $p^* = a$.

$$
\begin{aligned}
p^* \;=\; & a && \text{[exponentials]} \\
& -\left(1-\hat{\beta}\right)\delta b \frac{f\left(\hat{\beta}\delta b - p^*\right)}{f\left(\beta\delta b - p^*\right)} && \text{[sophisticates]} \\
& -\frac{F\left(\hat{\beta}\delta b - p^*\right) - F\left(\beta\delta b - p^*\right)}{f\left(\beta\delta b - p^*\right)} && \text{[naives]}
\end{aligned}
$$

2. *Hyperbolic agents.* Time inconsistency
   $\Longrightarrow$ below-marginal cost pricing: $p^* < a$.

   (a) *Sophisticates* ($\beta = \hat{\beta} < 1$): commitment.

   (b) *Naives* ($\beta < \hat{\beta} = 1$): overestimation of consumption.

MARKET (II). LEISURE GOODS

Payoffs of consumption at $t = 1$:

- Benefit at $t = 1$, stochastic
- Cost at $t = 2$, deterministic

$\Longrightarrow$ Use the previous setting: $-c$ is "current benefit", $b < 0$ is "future cost."

Results:

1. *Exponential agents.*

   Marginal cost pricing: $p^* = a$, $L^* = K$ (PC).

2. *Hyperbolic agents* tend to overconsume. $\Longrightarrow$

   Above-marginal cost pricing: $p^* > a$. Initial bonus $L^* < K$ (PC).

EXTENSIONS

- *Perfect Competition.* Can write maximization problem as

$$\max_{L,p} -L + \int_{-\infty}^{\hat{\beta}\delta b - p} (\delta b - p - c)\, dF(c)$$
$$\text{s.t. } \delta \{L - K + F(\beta\delta b - p)(p - a)\} = 0$$

  - Implies the same solution for p^*.

- *Heterogeneity.* Simple case of heterogeneity:
  - Share μ of fully naive consumers ($\beta < \hat{\beta} = 1$)
  - Share $1 - \mu$ of exponential consumers ($\beta = \hat{\beta} = 1$)
  - At $t = 0$ these consumers pool on same contract, given no immediate payoffs

- Maximization (with Monopoly):

$$\max_{L,p} \delta \left\{ L - K + \left[\mu F\left(\beta\delta b - p\right) + \left(1-\mu\right)\left(\delta b - p\right)\right]\left(p - a\right)\right\}$$

$$\text{s.t.} \quad -L + \int_{-\infty}^{\delta b - p} \left(\delta b - p - c\right) dF\left(c\right) \geq \overline{u}$$

- Solution:

$$\begin{aligned} p^* &= a \\ &\quad -\mu \frac{F\left(\delta b - p\right) - F\left(\beta\delta b - p\right)}{\mu f\left(\beta\delta b - p\right) + \left(1-\mu\right) f\left(\delta b - p\right)} \end{aligned}$$

- The higher the fraction of naives μ, the higher the underpricing of p

EMPIRICAL PREDICTIONS

Two predictions for time-inconsistent consumers:

1. Investment goods (Proposition 1):
   (a) Below-marginal cost pricing
   (b) Initial fee (Perfect Competition)
2. Leisure goods (Corollary 1)
   (a) Above-marginal cost pricing
   (b) Initial bonus or low initial fee (Perfect Competition)

FIELD EVIDENCE ON CONTRACTS

- US Health club industry ($11.6bn revenue in 2000)
  - monthly and annual contracts
  - Estimated marginal cost: $3-$6 + congestion cost
  - Below-marginal cost pricing despite small transaction costs and price discrimination
- Vacation time-sharing industry ($7.5bn sales in 2000)
  - high initial fee: $11,000 (RCI)
  - minimal fee per week of holiday: $140 (RCI)

- Credit card industry ($500bn outstanding debt in 1998)
  - Resale value of credit card debt: 20% premium (Ausubel, 1991)
  - No initial fee, bonus (car / luggage insurance)
  - Above-marginal-cost pricing of borrowing

- Gambling industry: Las Vegas hotels and restaurants:
  - Price rooms and meals below cost, at bonus
  - High price on gambling

WELFARE EFFECTS

Result 1. Self-control problems + Sophistication $\Rightarrow$ First best

- Consumption if $c \leq \beta\delta b - p^*$
- Exponential agent:
  - $p^* = a$
  - consume if $c \leq \delta b - p^* = \delta b - a$
- Sophisticated time-inconsistent agent:
  - $p^* = a - (1 - \beta)\delta b$
  - consume if $c \leq \beta\delta b - p^* = \delta b - a$
- Perfect commitment device
- Market interaction maximizes joint surplus of consumer and firm

Result 2. Self-control + Partial naiveté $\Rightarrow$ Real effect of time inconsistency

- $p^* = a - [F(\delta b - p^*) - F(\beta\delta b - p^*)]/f(\beta\delta b - p^*)$

- Firm sets p^* so as to accentuate overconfidence

- Two welfare effects:
  - Inefficiency: $\text{Surplus}_{\text{naive}} \leq \text{Surplus}_{\text{soph.}}$
  - Transfer (under monopoly) from consumer to firm

- Profits are increasing in naivete' $\hat{\beta}$ (monopoly)

- $\text{Welfare}_{\text{naive}} \leq \text{Welfare}_{\text{soph.}}$

- Large welfare effects of non-rational expectations

2.2 Self-Control II

- **Kfir and Spiegler (RES 2006),** Contracting with Diversely Naive Agents.

- Extend DellaVigna and Malmendier (2004):
  - incorporate heterogeneity in naiveté
  - allow more flexible functional form in time inconsistency
  - different formulation of naiveté

- Setup:
  1. Actions:
     - Action $a \in [0, 1]$ taken at time 2
     - At time 1 utility function is $u(a)$
     - At time 2 utility function is $v(a)$
  2. Beliefs: At time 1 believe:
     - Utility is $u(a)$ with probability θ
     - Utility is $v(a)$ with probability $1 - \theta$
     - Heterogeneity: Distribution of types θ
  3. Transfers:
     - Consumer pays firm $t(a)$
     - Restrictive assumption: no cost to firm of providing a

- Therefore:
  - Time inconsistency ($\beta < 1$) –> Difference between u and v
  - Naiveté ($\hat{\beta} > \beta$) –> $\theta > 0$
  - Partial naiveté here modelled as stochastic rather than deterministic
  - Flexibility in capturing time inconsistency (self-control, reference dependence, emotions)

- Main result:
- **Proposition 1.** There are two types of contracts:
  1. Perfect commitment device for sufficiently sophisticated agents ($\theta < \underline{\theta}$)
  2. Exploitative contracts for sufficiently naive agents ($\theta > \underline{\theta}$)

- Commitment device contract:
  - Implement $a_\theta = \max_a u(a)$
  - Transfer:
    * $t(a_\theta) = \max_a u(a)$
    * $t(a) = \infty$ for other actions
  - Result here is like in DM: Implement first best

- Exploitative contract:
  - Agent has negative utility:

$$u\left(a_\theta^v\right) - t\left(a_\theta^v\right) < 0$$

  - Maximize overestimation of agents:

$$a_\theta^u = \arg\max\left(u\left(a\right) - v\left(a\right)\right)$$

2.3 Bounded Rationality

- Gabaix and Laibson (2003), *Competition and Consumer Confusion*
- Non-standard feature of consumers:
  - Limited ability to deal with complex products
  - imperfect knowledge of utility from consuming complex goods
- Firms are aware of bounded rationality of consumers
  $\longrightarrow$ design products & prices to take advantage of bounded rationality of consumers

Example: Checking account. Value depends on

- interest rates
- fees for dozens of financial services (overdrafts, more than x checks per months, low average balance, etc.)
- bank locations
- bank hours
- ATM locations
- web-based banking services
- linked products (e.g. investment services)

Given such complexity, consumers do not know the exact value of products they buy.

Model

- Consumers receive noisy, *unbiased* signals about product value.
  - Agent a chooses from n goods.
  - True utility from good i:

$$Q_i - p_i$$

  - Utility signal

$$U_{ia} = Q_i - p_i + \sigma_i \varepsilon_{ia}$$

    σ_i is complexity of product i.

    ε_{ia} is zero mean, iid across consumers and goods, with density f and cumulative distribution F.

    (Suppress consumer-specific subscript a; $U_i \equiv U_{ia}$ and $\varepsilon_i \equiv \varepsilon_{ia}$.)

- Consumer decision rule: Picks the one good with highest signal U_i from $(U_i)_{i=1}^n$.

Market equilibrium with exogenous complexity. Bertrand competition with

- Q_i : quality of a good,

  σ_i : complexity of a good,

  c_i : production cost

  p_i : price

- Simplification: Q_i, σ_i, c_i identical across firms. (*Problem: How should consumers choose if all goods are known to be identical?*)

- Firms maximize profit $\pi_i = (p_i - c_i) D_i$

- Symmetry reduces demand to

$$D_i = \int f(\varepsilon_i) F\left(\frac{p_j - p_i + \sigma\varepsilon_i}{\sigma}\right)^{n-1} d\varepsilon_i$$

Example of demand curves

Gaussian noise $\varepsilon \sim N(0,1)$, 2 firms

Demand curve faced by firm 1:

$$\begin{aligned} D_1 &= P\left(Q - p_1 + \sigma\varepsilon_1 > Q - p_2 + \sigma\varepsilon_2\right) \\ &= P\left(p_2 - p_1 > \sigma\sqrt{2}\eta\right) \text{ with } \eta = \left(\varepsilon_2 - \varepsilon_1\right)/\sqrt{2} \text{ N(0,1)} \\ &= \Phi\left(\frac{p_2 - p_1}{\sigma\sqrt{2}}\right) \end{aligned}$$

Usual Bertrand case ($\sigma = 0$) : infinitely elastic demand at $p_1 = p_2$

$$D_1 \in \left\{ \begin{array}{ccc} 1 & \text{if} & p_1 < p_2 \\ [0,1] & \text{if} & p_1 = p_2 \\ 0 & \text{if} & p_1 > p_2 \end{array} \right\}$$

Complexity case ($\sigma > 0$) : Smooth demand curve, no infinite drop at $p_1 = p_2$. At $p_1 = p_2 = p$ demand is $1/2$.

$$\max_{p_1} \Phi\left(\frac{p_2 - p_1}{\sigma\sqrt{2}}\right)[p_1 - c_1]$$

$$f.o.c. : -\frac{1}{\sigma\sqrt{2}}\phi\left(\frac{p_2 - p_1}{\sigma\sqrt{2}}\right)[p_1 - c_1] + \Phi\left(\frac{p_2 - p_1}{\sigma\sqrt{2}}\right) = 0$$

Intuition for non-zero mark-ups: Lower elasticity increases firm mark-ups and profits. Mark-up proportional to complexity σ.

Endogenous complexity

- Consider Normal case –> For $\sigma \to \infty$

$$\max_{p_1} \Phi\left(\frac{p_2 - p_1}{\sigma\sqrt{2}}\right)[p_1 - c_1] \to \max_{p_1} \frac{1}{2}[p_1 - c_1]$$

Set $\sigma \to \infty$ and obtain infinite profits by letting $p_1 \to \infty$

(Choices are random, Charge as much as possible)

- Gabaix and Laibson: Concave returns of complexity $Q_i(\sigma_i)$

  Firms increase complexity, unless "clearly superior" products in model with heterogenous products.

In a nutshell: market does not help to overcome bounded rationality. Competition may not help either

- More work on Behavioral IO:
- **Heidhus-Koszegi (2006, 2007)**
  - Incorporate reference dependence into firm pricing
  - Assume reference point rational exp. equilibrium (**Koszegi-Rabin**)
  - Results on
    - Price compression (consumers hate to pay price higher than reference point)
    - But also: Stochastic sales
- **Gabaix-Laibson (2006)**
  - Consumers pay attention to certain attributes, but not others (Shrouded attributes)

  - Form of limited attention
  - Firms charge higher prices on shrouded attributes (add-ons)
  - Similar to result in **DellaVigna-Malmendier (2004)**: Charge more on items consumers do not expect to purchase

- **Ellison (2006):** Early, concise literature overview

- Future work: *Empirical Behavioral IO*
  - Document non-standard behavior
  - Estimate structurally
  - Document firm response to non-standard feature

3 Methodology: Markets and Non-Standard Behavior

- Why don't market forces eliminate non-standard behavior?
- Common Chicago-type objection
- **Argument 1.** Experience reduces non-standard behavior.
  - Experience appears to mitigate the endowment effect (List, 2003 and 2004).
  - Experience improves ability to perform backward induction (Palacios-Huerta and Volji, 2007 and 2008)
  - BUT: Maybe experience does not really help (Levitt, List, and Reiley, 2008)

- What does experience imply in general?
  * Feedback is often infrequent (such as in house purchases) or noisy (such as in financial investments) –>not enough room for experience
  * Experience can exacerbate a bias if individuals are not Bayesian learners (Haigh and List 2004)
  * Not all non-standard features should be mitigated by experience. Example: social preferences
  * Debiasing by experienced agents can be a substitute for direct experience. However, as Gabaix and Laibson (2006) show, experienced agents such as firms typically have little or no incentive to debias individuals

- *Curse of Debiasing* (Gabaix-Laibson 2006)
  - Credit Card A teaser fees on $1000 balance:
    - $0 for six months
    - $100 fee for next six months
  - Cost of borrowing to company $100 –> Firm makes 0 profit in Perfectly Competitive market
  - Naive consumer:
    - Believes no borrowing after 6 months
    - Instead keeps borrowing
    - Expects cost of card to be $0, instead pays $100

- Can Credit Card B debias consumers and profit from it?
  - Advertisement to consumers: 'You will borrow after 6 months!'
  - Offer rate of
    - $50 for six months
    - $50 for next six months
- What do consumers (now sophisticated) do?
  - Stay with Card A
    - Borrow for 6 months at $0
    - Then switch to another company
- No debiasing in equilibrium

- System of transfers:
  - Firms take advantage of naive consumers
  - Sophisticated consumers benefit from naive consumers
- Related: Suppose Credit Card B can identify naive consumer
  - What should it do?
  - If debias, then lose consumer
  - Rather, take advantage of consumer

- **Argument 2.** Even if experience or debiasing do not eliminate the biases, the biases will not affect aggregate market outcomes
  - Arbitrage –> Rational investors set prices
  - However, limits to arbitrage (DeLong et al., 1991) –> individuals with non-standard features affect stock prices
  - In addition, in most settings, there is no arbitrage!
    - Example: Procrastination of savings for retirement
    - (Keep in mind SMRT plan though)
  - Behavioral IO: Non-standard features can have a disproportionate impact on market outcomes
    - Firms focus pricing on the biases
    - **Lee and Malmendier (2011)** on overbidding in eBay auctions

Table V. Disproportionate Influence of Overbidders

		Observations	(Percent)
Auction-level sample			
Does the auction end up overbid?	No	78	56.52%
	Yes	60	**43.48%**
Total		138	100.00%
Bidder-level sample			
Does the bidder ever overbid?	No	670	83.02%
	Yes	137	**16.98%**
Total		807	100.00%
Bid-level sample			
Is the bid an over-bid?	No	2,101	89.29%
	Yes	252	**10.71%**
Total		2,353	100.00%

Overbidding is defined using the final price.

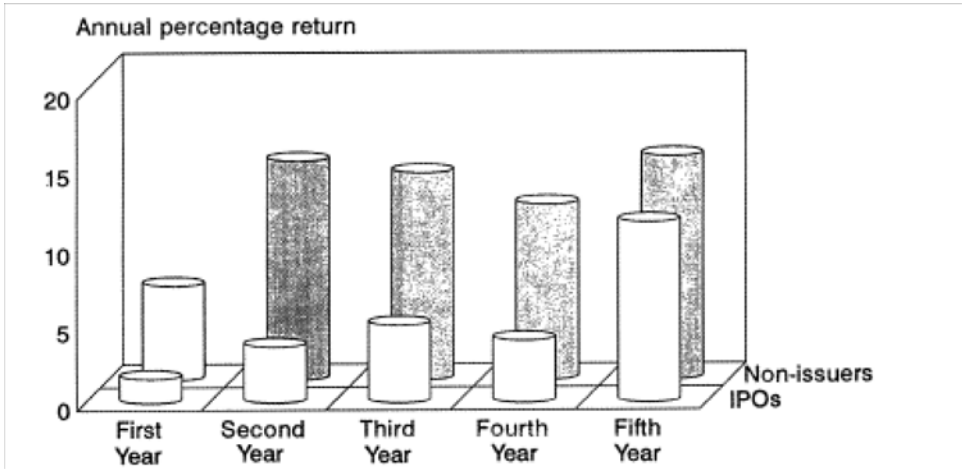
- Bidders with bias have *disproportionate* impact
- Opposite of Chicago intuition

4 Market Reaction to Biases: Corporate Decisions

- **Baker, Ruback, and Wurgler (2005**)
- Behavioral corporate finance:
  - biased investors (overvalue or undervalue company)
  - smart managers
  - (Converse: biased (overconfident) managers and rational investors)
- Firm has to decide how to finance investment project:
  1. internal funds (cash flow/retained earnings)
  2. bonds
  3. stocks

- Fluctuation of equity prices due to noise traders
- Managers believe that the market is inefficient
  - Issue equity when stock price exceeds perceived fundamental value
  - Delay equity issue when stock price below perceived fundamental value
- Consistent with
  - Survey Evidence of 392 CFO's (Graham and Harvey 2001): 67% say under/overvaluation is a factor in issuance decision
  - Insider trading
- Go over quickly two examples

- **Long-run performance of equity issuers**
  - Market Timing prediction: Companies issuing equity underperform later
  - Loughran-Ritter (1995): Compare matching samples of
    - companies doing IPOs
    - companies not doing IPOs but have similar market cap.



- Similar finding with SEOs

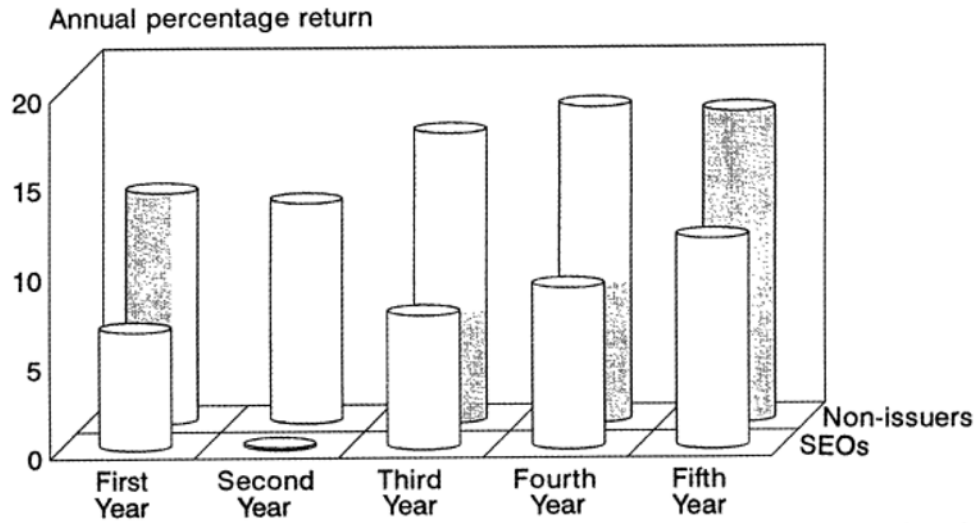


Figure 2. The average annual raw returns for 4,753 initial public offerings (IPOs), and their matching nonissuing firms (top), and the average annual raw returns for 3,702 seasoned equity offerings (SEOs), and their matching nonissuing firms (bottom), during the five years after the issue. The equity issues are from 1970 to 1990. Using the first closing postissue market price, the equally weighted average buy-and-hold return for the year after the issue is calculated for the issuing firms and for their matching firms (firms with the same market capitalization that have not issued equity during the prior five years). On each anniversary of the issue date, the equally weighted average buy-and-hold return during the next year for all of the surviving issuers and their matching firms is calculated. For matching firms that get delisted (or issue equity) while the issuer is still trading, the proceeds from the sale on the delisting date are reinvested in a new matching firm for the remainder of that year (or until the issuer is delisted). The numbers graphed above are reported in Table III.

5 Market Reaction to Biases: Employers

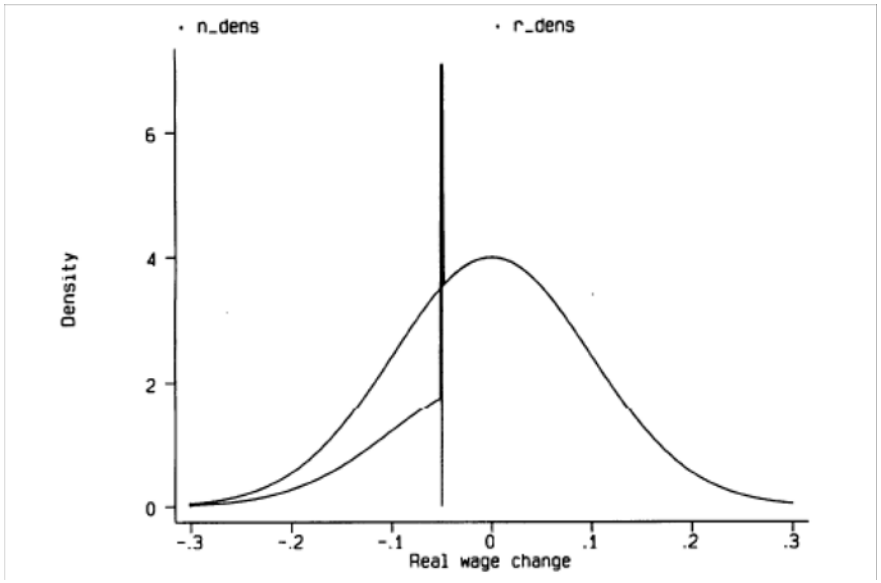
- **Kahneman, Knetsch and Thaler (1986)**: Telephone surveys in Canada in 1984 and 1985 –> Ask questions on fairness

Question 4A. A company is making a small profit. It is located in a community experiencing a recession with substantial unemployment but no inflation. There are many workers anxious to work at the company. The company decides to decrease wages and salaries 7% this year.
($N = 125$) Acceptable 38% Unfair 62%

Question 4B. ...with substantial unemployment and inflation of 12%...The company decides to increase salaries only 5% this year.
($N = 129$) Acceptable 78% Unfair 22%

- – A real and nominal wage cut is not fair (Question 4A)
  – A real (but not nominal) wage cut is fair (Question 4B)

- If this is true, expect employers to minimize cases of $w_t - w_{t-1} < 0$
- **Card and Hyslop, 1997**: Examine discontinuity around 0 of nominal wage changes
- Prediction of theory:



- Data sources:
  - 1979-1993 CPS.
    - Rolling 2-year panel
    - Restrict to paid by the hour and to same 2-digit industry in the two years
    - Restrict to non-minimum wage workers
  - PSID 4-year panels 1976-79 and 1985-88
- Use Log Wage changes: $\log w_t - \log w_{t-1}$
- Issue with measurement error and heaping at $\log w_t - \log w_{t-1} = 0$
- Construct counterfactual density of LogWage changes
  - Assume symmetry
  - Positive log wage changes would not be affected

- Plots using kernel estimates of density (local smoother)
- Compare the actual distribution and the predicted one
- Evidence from the CPS year-by-year
- Problem more severe in years with lower inflation

- Large effect of nominal rigidities
- Effect on firings?

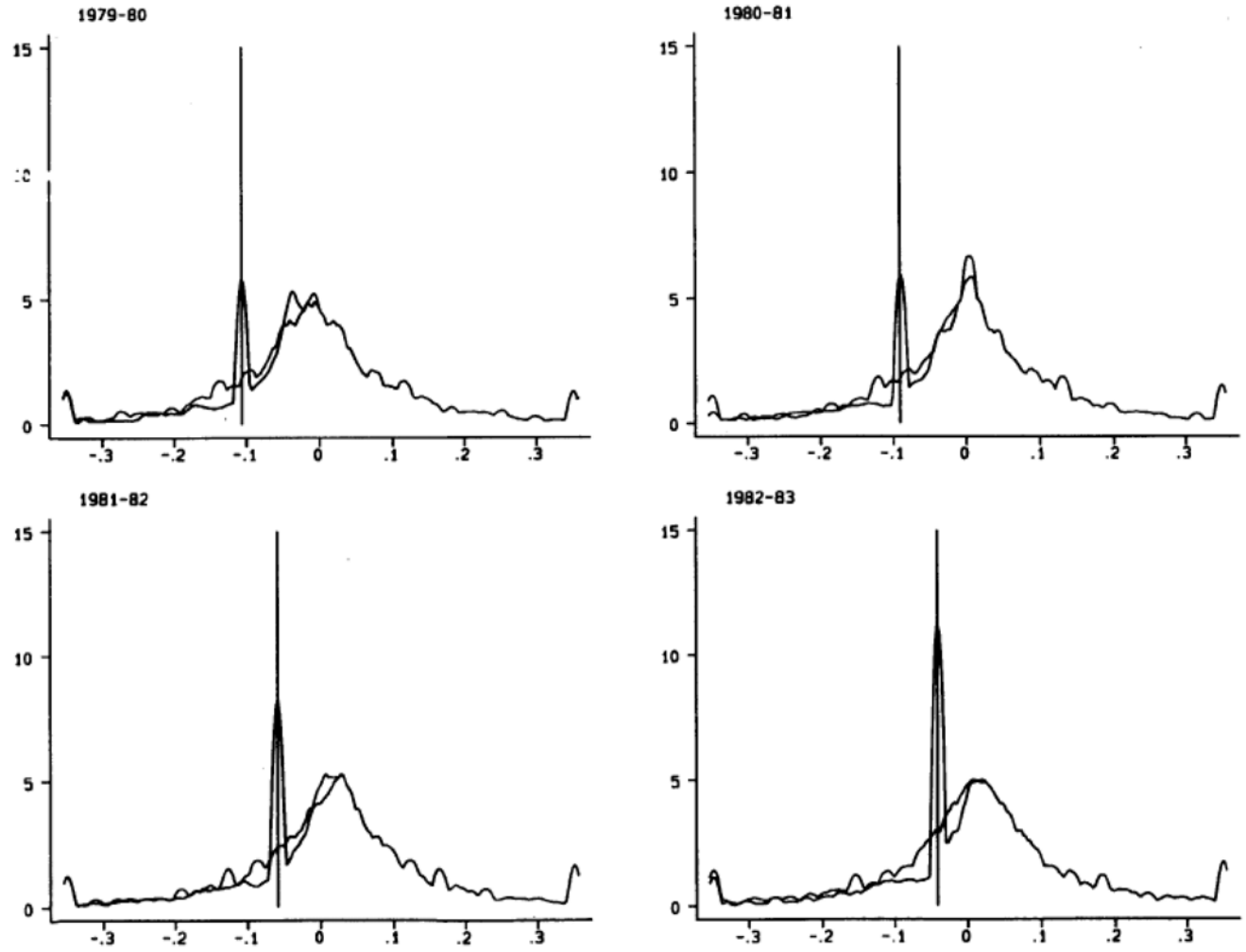


Figure 4: Smoothed (Kernel) Estimates of Actual and Counterfactual Densities of Real Wage Changes, CPS Samples from 1979-80 to 1982-83

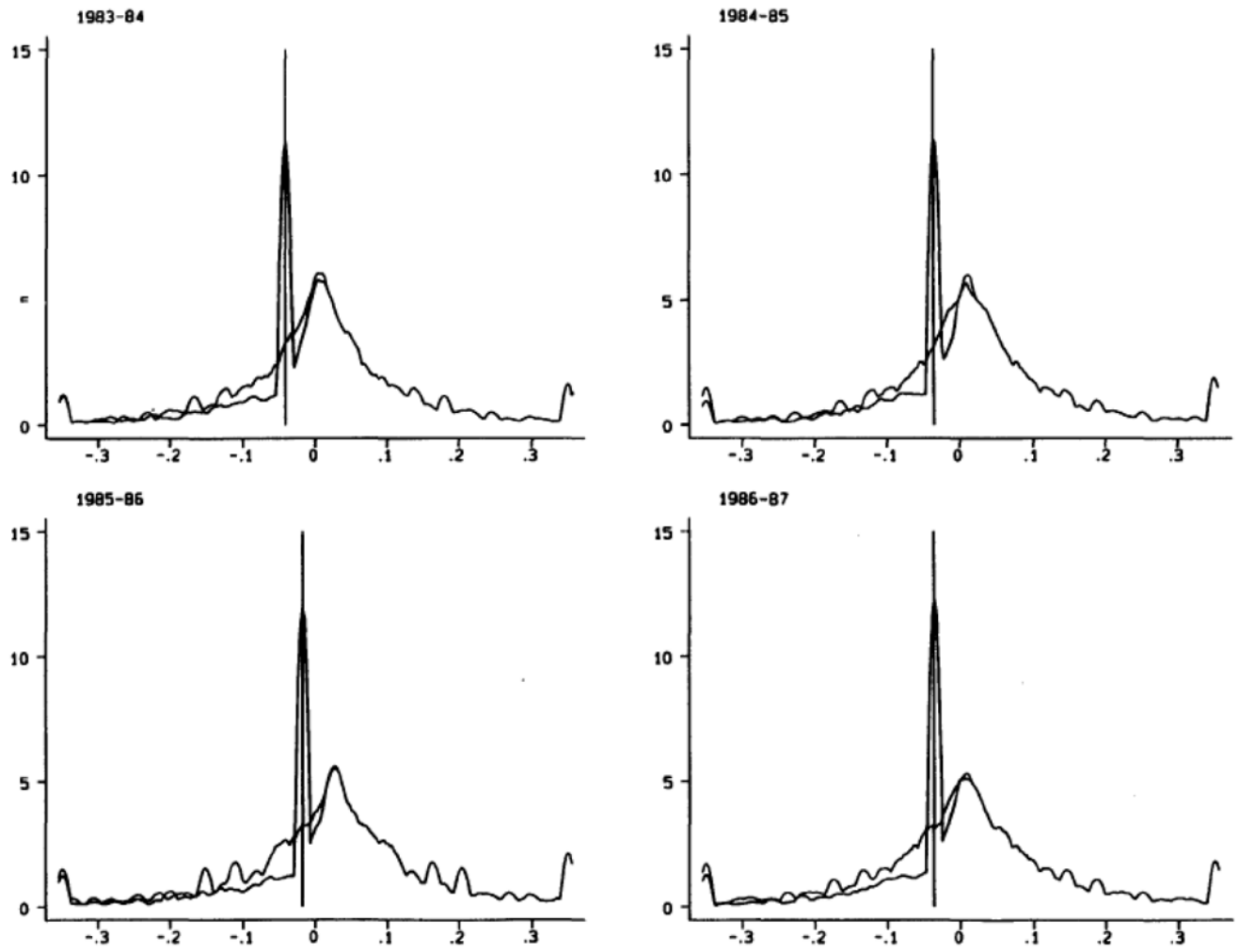


Figure 4 (Continued): Smoothed (Kernel) Estimates of Actual and Counterfactual Densities of Real Wage Changes, CPS Samples from 1983-84 to 1986-87

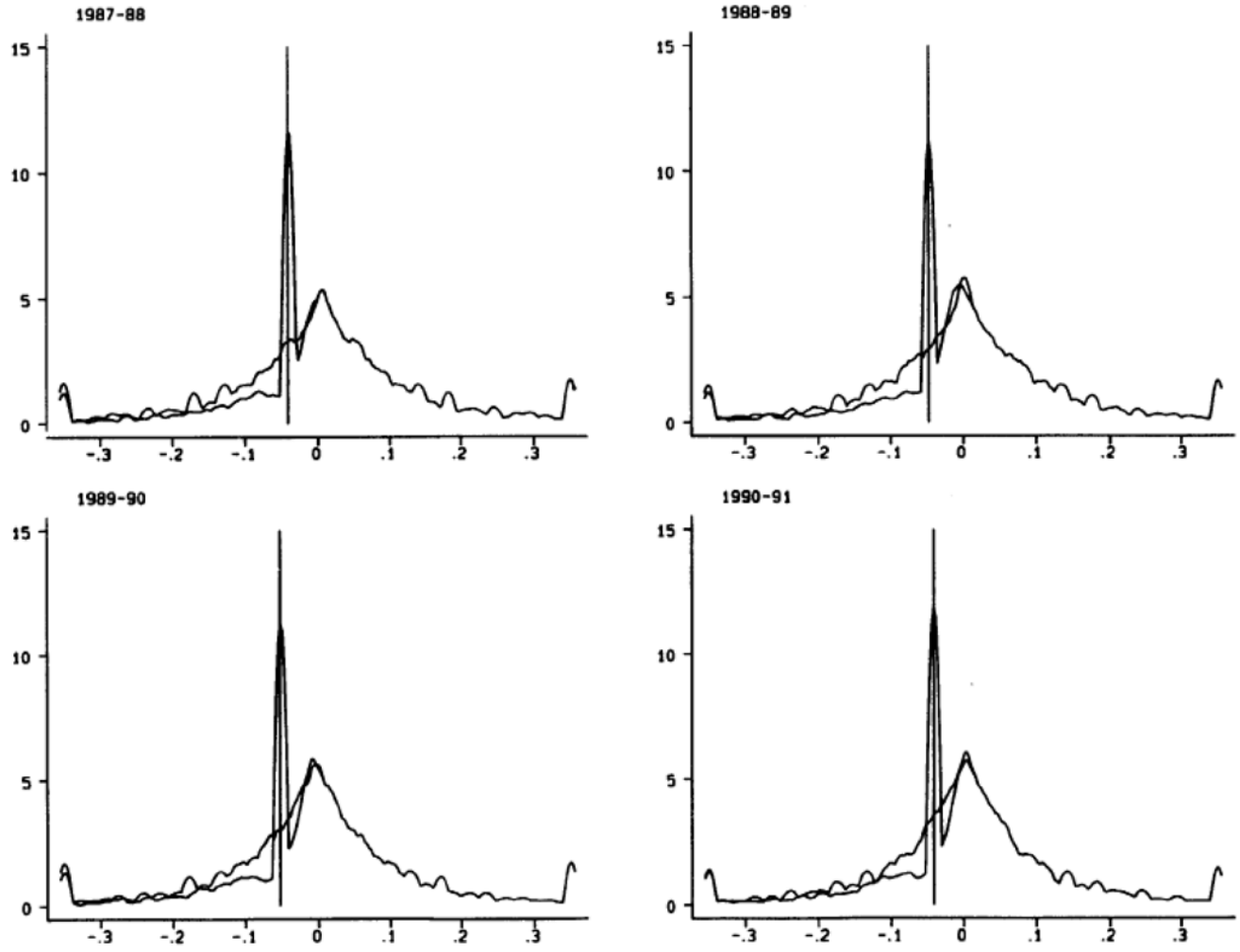


Figure 4 (Continued): Smoothed (Kernel) Estimates of Actual and Counterfactual Densities of Real Wage Changes, CPS Samples from 1987-88 to 1990-91

6 Market Reaction to Biases: Political Economy

- Interaction between:
  - (Smart) Politicians:
    - Personal beliefs and party affiliation
    - May pursue voters/consumers welfare maximization
    - BUT also: strong incentives to be reelected
  - Voters (with biases):
    - Low (zero) incentives to vote
    - Limited information through media
    - Likely to display biases
- **Behavioral political economy**

- Examples of voter biases:
  - Effect of candidate order (Ho and Imai)
  - Imperfect signal extraction (Wolfers, 2004) –> Voters more likely to vote an incumbent if the local economy does well even if... it's just due to changes in oil prices
  - Susceptible to persuasion (DellaVigna and Kaplan, 2007)
  - More? Short memory about past performance?
- **Eisensee and Stromberg (QJE 2007)**: Limited attention of voters

- Setting:
  - Natural Disasters occurring throughout the World
  - US Ambassadors in country can decide to give Aid
  - Decision to give Aid affected by
    - Gravity of disaster
    - Political returns to Aid decision
- Idea: Returns to aid are lower when American public is distracted by a major news event

- Main Measure of Major News: median amount of Minutes in Evening TV News captured by top-3 news items (Vanderbilt Data Set)

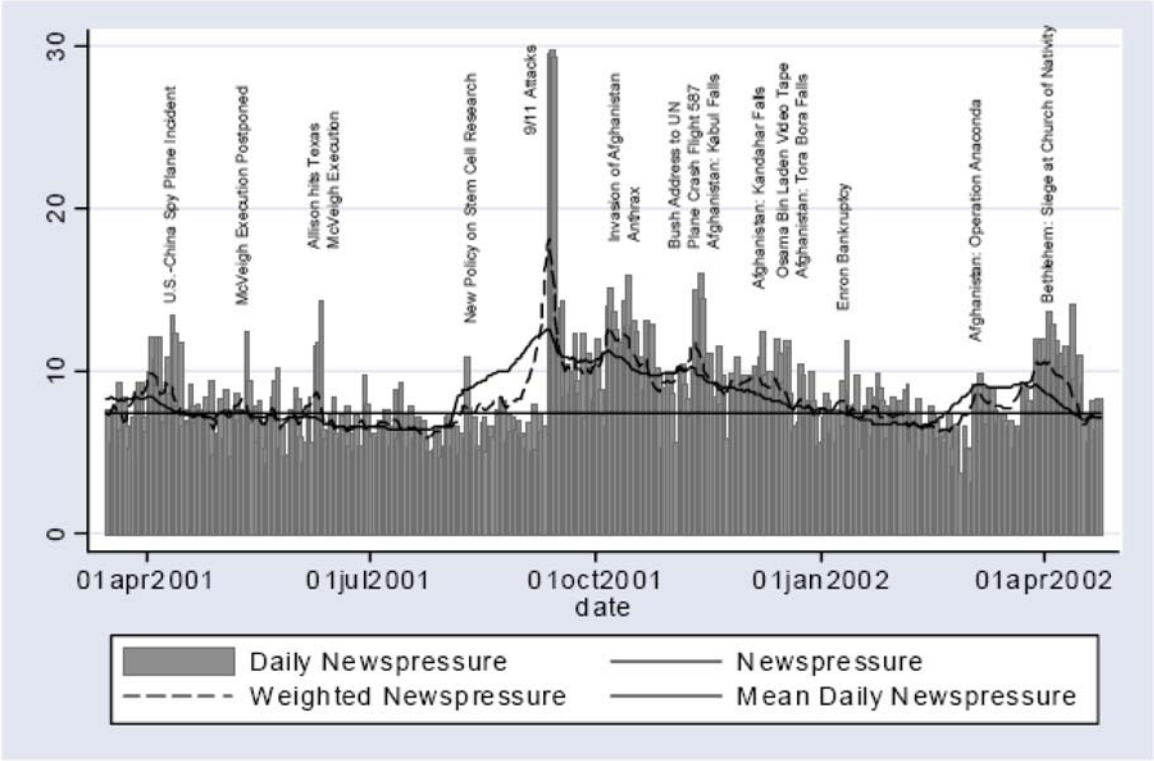


FIGURE IV
News Pressure (Minutes) during 405 Days, 15 March 2001 – 23 Apr 2002, by Day

- – Dates with largest news pressure

TABLE III

DATES OF TWO LARGEST *daily news pressure* AND MAIN STORY, BY YEAR

Year	Date	Main News Story
2003	14 Aug	*New York City Blackout*
	22 Mar	*Invasion of Iraq: Day 3*
2002	11 Sep	*9/11 Commemoration*
	24 Oct	*Sniper Shooting in Washington: Arrest of Suspects*
2001	13 Sep	*9/11 Attack on America: Day 3*
	12 Sep	*9/11 Attack on America: Day 2*
2000	26 Nov	*Gore vs. Bush: Florida Recount - Certification by Katherine Harris*
	8 Dec	*Gore vs. Bush: Florida Recount - Supreme Court Ruling*
1999	1 Apr	*Kosovo Crisis: U.S. Soldiers Captured*
	18 Jul	*Crash of Plane Carrying John F. Kennedy, Junior*
1998	16 Dec	*U.S. Missile Attack on Iraq*
	18 Dec	*Clinton Impeachment*
1997	23 Dec	*Oklahoma City Bombing: Trial*
	31 Aug	*Princess Diana's Death*
1996	18 Jul	*TWA Flight 800 Explosion*
	27 Jul	*Olympic Games Bombing in Atlanta*
1995	3 Oct	*O.J. Simpson Trial: The Verdict*
	22 Apr	*Oklahoma City Bombing*
1994	17 Jan	*California Earthquake*
	18 Jun	*O.J. Simpson Arrested*
1993	17 Jan	*U.S. Missile Attack on Iraq*
	20 Apr	*Waco, Texas: Cult Standoff Ends in Fire*
1992	16 Jul	*Perot Quits 1992 Presidential Campaign*
	1 May	*Los Angeles Riots*

- 5,000 natural Disasters in 143 countries between 1968 and 2002 (CRED)
  - 20 percent receive USAID from Office of Foreign Disaster Assistance (first agency to provide relief)
  - 10 percent covered in major broadcast news
  - OFDA relief given if (and only if) Ambassador (or chief of Mission) in country does Disaster Declaration
  - Ambassador can allocate up to $50,000 immediately

- Estimate

$$\text{Re}\,lief = \alpha News + \beta X + \varepsilon$$

- Below: $News$ about the Disaster is instrumented with:
  - Average News Pressure over 40 days after disaster
  - Olympics

TABLE IV

EFFECT OF THE PRESSURE FOR NEWS TIME ON DISASTER *News* AND *Relief*

	Dependent variable: *News*				Dependent variable: *Relief*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
News Pressure	-0.0162	-0.0163	-0.0177	-0.0142	-0.0117	-0.0119	-0.0094	-0.0078
	(0.0041)***	(0.0041)***	(0.0057)***	(0.0037)***	(0.0045)***	(0.0045)***	(0.0058)	(0.0040)**
Olympics	-0.1078	-0.1079	-0.0871	-0.111	-0.1231	-0.1232	-0.1071	-0.1098
	(0.0470)**	(0.0470)**	(-0.0628)	(0.0413)***	(0.0521)**	(0.0521)**	(0.0763)	(0.0479)**
World Series	-0.1133				-0.1324			
	(-0.1065)				(0.1031)			
log Killed			0.0605				0.0582	
			(0.0040)***				(0.0044)***	
log Affected			0.0123				0.0376	
			(0.0024)***				(0.0024)***	
imputed log Killed				0.0491				0.0442
				(0.0034)***				(0.0037)***
imputed log Affected				0.0151				0.0394
				(0.0020)***				(0.0020)***
Observations	5212	5212	2926	5212	5212	5212	2926	5212
R-squared	0.1799	0.1797	0.3624	0.2875	0.1991	0.1989	0.4115	0.3726

Linear probability OLS regressions. All regressions include year, month, country and disaster type fixed effects. Regressions with imputed values ((4) and (8)) also include fixed effects for the interaction of missing values and disaster type. Robust standard errors in parentheses:* significant at 10%; ** significant at 5%; *** significant at 1%.

- – 1st Stage: 2 s.d increase in News Pressure (2.4 extra minutes) decrease
  - ∗ probability of coverage in news by 4 ptg. points (40 percent)
  - ∗ probability of relief by 3 ptg. points (15 percent)

- Is there a spurious correlation between instruments and type of disaster?
- No correlation with severity of disaster

TABLE V

CORRELATIONS BETWEEN INSTRUMENTS AND THE SEVERITY OF DISASTERS

	Dependent variable	
	News Pressure	*Olympics*
log Killed	-0.0082	0.0003
	(0.0113)	(0.0010)
log *Affected*	0.0005	-0.0006
	(0.0068)	(0.0006)
p-value: F-test of joint insignificance	0.75	0.62
Observations	5212	5212
R-squared	0.3110	0.2035

OLS regressions with the instruments *News Pressure* and *Olympics* as dependent variables, and including year, month, country and disaster type fixed effects. Robust standard errors in parentheses:* significant at 10%; ** significant at 5%; *** significant at 1%. The F-test tests the joint significance of log *Killed* and log *Affected* in the regression.

- OLS and IV Regressions of Reliefs on presence in the News
- (Instrumented) availability in the news at the margin has huge effect: Almost one-on-one effect of being in the news on aid

TABLE VI

DEPENDENT VARIABLE: *Relief*

	OLS					IV		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
News	0.2886	0.158	0.1309	0.2323	0.2611	0.8237	0.6341	0.6769
	(0.0200)***	(0.0232)***	(0.0178)***	(0.0328)***	(0.0569)***	(0.2528)***	(0.3341)*	(0.2554)***
News*abs(Pr(news)-0.5)				-0.4922	-0.302			
				(0.1059)***	(0.0840)***			
abs(Pr(news)-0.5)				0.5374	0.2959			
				(0.0943)***	(0.0831)***			
log Killed		0.0486					0.0198	
		(0.0046)***					-0.0208	
log Affected		0.0358					0.0299	
		(0.0024)***					(0.0048)***	
imputed log Killed			0.0378	0.0546	0.0307			0.0109
			(0.0038)***	(0.0049)***	(0.0046)***			-0.0132
imputed log Affected			0.0375	0.0445	0.0345			0.0292
			(0.0020)***	(0.0023)***	(0.0026)***			(0.0045)***
F-stat, instruments, 1st stage						11.0	6.1	11.1
Over-id restrictions, χ^2_{df} (p-value)						0.51_1(0.47)		0.64_1 (0.42)
Observations	5212	2926	5212	5212	5027	5212	2926	5212
R-squared	0.2443	0.4225	0.3800	0.3860				

All regressions include year, month, country, and disaster type fixed effects. Regressions with imputed values ((3), (4) and (5)) also include fixed effects for the interaction of missing values and disaster type. Robust standard errors in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%.

- **Finan and Schechter (2012 EMA):** Politicians target voter reciprocity
  - Motivation is vote buying
  - Politicians do favors to individuals in the hope of the return of a vote
  - BUT: Vote is private, no way to enforce a contract
- Solution that makes the contract enforceable: reciprocity of voters
  - Voter that receives a gift takes into account the politician
  - In return, provides vote
- Similar to gift exchange in the workplace
  - Reciprocity helps enforcement of 'contract'

- BUT: Vote-maximizing politician must find reciprocal voters
- Finan and Schechter do survey in Paraguay in 2002, 2007, and 2010
- Survey of voters:
  - In 2002 asked to play trust game
    - First mover has allocation of 8k and decide how much to send to recipient: 0, 2k, 4k, 6k, 8k
    - Money sent to recipient is tripled
    - Recipient decides how much money to send back (strategy method)
    - Measure of reciprocity: Share returned by recipient when receiving 12k+ versus when receiving 6k

- In 2007 ask voters whether targeted by vote-buying:
  - ‘*whether, during the run-up to the 2006 elections, any political party offered them money, food, payment of utility bills, medicines, and/or other goods (excluding propaganda hats, shirts, and posters)*’
  - 26 percent say yes

- Survey of middlemen in 2010
  - Evidence that they know villagers well
  - Ex.: Correlation between actual years of schooling and middleman report: 0.73
  - (Lower correlation in prediction of amount sent in dictator game, 0.08)

- Main evidence: clear correlation of self-reported vote-buying and reciprocity measure

- Social preferences used for evil purposes!

VOTE-BUYING AND RECIPROCITY

	Dependent Variable[a]				
	Individual Offered Something in Exchange for Vote				Individual Offered Something in Exchange for Vote (as Reported by the Middlemen)
	(1)	(2)	(3)	(4)	(5)
Reciprocity	1.259	1.318	1.207	1.294	0.382
	[0.512]**	[0.568]**	[0.640]*	[0.579]**	[0.223]*
Observations	139	139	103	139	314
Mean of dependent variable	0.23	0.23	0.23	0.23	0.47
Main controls	N	Y	Y	Y	Y
Controls for other personal traits	N	N	Y	N	N
Controls for social network	N	N	N	Y	N

- What explains political participation?
  - Olson (1965): Public good problem: Even if think participation is right, individually better off staying at home
  - Example 1: Riots and protests
  - Example 2: Voter turnout at the polls -> Probability of being pivotal very small
- Series of papers introduce variants of social preferences to explain participation in political activities
- **Passarelli and Tabellini (2013):**
  - Focus on protests
  - Assume negative reciprocity and role of emotions

- Individuals treated poorly by government get glow from protesting

- Model in a nutshell for individual i
  - Cost of participating to protest ε_i
  - Psychological benefit of participation to protest a_i
  - Benefit a_i depends on aggrievement:

$$a_i = \begin{cases} 0 & \text{if} \quad V_i \geq \hat{V} \\ \omega \left(V - \hat{V}\right)^2 & \text{if} \quad V_i < \hat{V} \end{cases}$$

  - V_i is welfare of individual i with given policy
  - $\hat{V}$ is what individual thinks appropriate (can be self-biased)
  - Ad-hoc form of reference dependence
  - When aggrieved, individual willing to incur cost of participation because of glow from participation

- **DellaVigna, List, Malmendier, Rao (2013)**
  - Related idea: Explain voter turnout with social preferences
  - Tie to social interactions
  - Identify using field experiment design

Why do people vote?

Two classical answers:

- ***Pivotal voting***: Vote because of probability of affecting outcome (Downs 1957, Ledyard 1984, and Palfrey and Rosenthal 1983)
  → People act *as if* voting is pivotal, but magnitudes off
- ***Norm-based voting***: Vote because of norm / identity / signaling (Harsanyi 1977, 1992; Knack 1992; and Blais 2000)
  → But limited empirical content
- We design an experiment to test novel explanation: ***Voting Because Others Will Ask***
  - Post-election: Others will ask you whether you voted.
    - If voted → pride of saying "yes"
    - If did not vote → shame of admitting "no" OR cost of lying
  - Pre-election: Anticipation of being asked induces turnout
  - Motivation: 40 percent of non-voters say they voted (ANES)

Determinants of Voting

Four determinants of voting

1. Pivotality $\boldsymbol{pV}$

   p = subjective probability of being pivotal

   V = value of deciding the election

2. Warm glow $\boldsymbol{g}$
3. Cost of voting $\boldsymbol{c}$
4. Social Image utility

Focus of this paper

$\boldsymbol{s_V}$ = utility from saying one voted

$\boldsymbol{s_N}$ = utility from saying one did not vote

social image

$\boldsymbol{L}$ = psychological cost of lying

dishonesty

- Non-voters lie about voting if $s_V - L > s_N \leftrightarrow s_V - s_N > L$
- Voters lie if $s_N - L > s_V$

(Net) Expected Utility from Voting

Voting iff

$$\underbrace{pV + g - c}_{= \varepsilon} + N \underbrace{[\max(s_V, s_N - L) - \max(s_N, s_V - L)]}_{\text{= net utility gain from having voted, due to being asked once}} \geq 0$$

Can rewrite as: $N\Phi(s_v - s_L, L) + \varepsilon \geq 0$

where $\Phi(s_v - s_L, L) = \begin{cases} \min(s_V - s_N, L) & \text{if } s_V - s_N \geq 0 \\ \max(s_V - s_N, L) & \text{if } s_V - s_N < 0 \end{cases}$

Experimental Design

- Field experiment: door-to-door survey
  - Match to voting records
  - Identify all-voter and all-non-voter households
  - No Flyer: unannounced survey
  - Flyer: flyer on doorknob day before provides advance notice about hour of visit - no information on sv. content
  - Election Flyer: flyer on doorknob on day before provides advance notice about hour of visit – says survey will be about "voter participation"

Flyer Design

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Researchers will
visit this address
tomorrow (/)
between and
to conduct a
5 minute survey.

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University of
Chicago Study

Researchers will visit this
address tomorrow
(/)
between and to
conduct a
**5 minute survey on your
voter participation in the
2010 congressional
election.**

Model Predictions

- **Prop. 1.** With pride in voting ($s_V > 0$), voters should be more likely to be at home and answer the door if informed of election survey
- **Prop. 2.** With stigma from not voting ($s_N < 0$), non-voters should be less likely to be at home and answer the door if informed of election survey

- **Prop. 3.** The probability of lying about voting should increase in the incentive to do so
- **Prop. 4.** The probability of voting should increase in the number of times asked N

Experimental Design

- Field experiment: door-to-door survey
  - Match to voting records
  - Identify all-voter and all-non-voter households
  - Control: unannounced survey
  - Flyer: flyer on doorknob day before provides advance notice about hour of visit - no information on sv. content
  - Election Flyer: flyer on doorknob on day before provides advance notice about hour of visit – says survey will be about "voter participation"
  - Duration of, and Payment for, Survey: Crossed with other treatments

Flyer Design

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Researchers will visit this address tomorrow (/) between and to conduct a **5 minute survey.**

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Researchers will visit this address tomorrow (/) between and to conduct a **10 minute survey**.

You will be paid **$10 in cash** for your participation.

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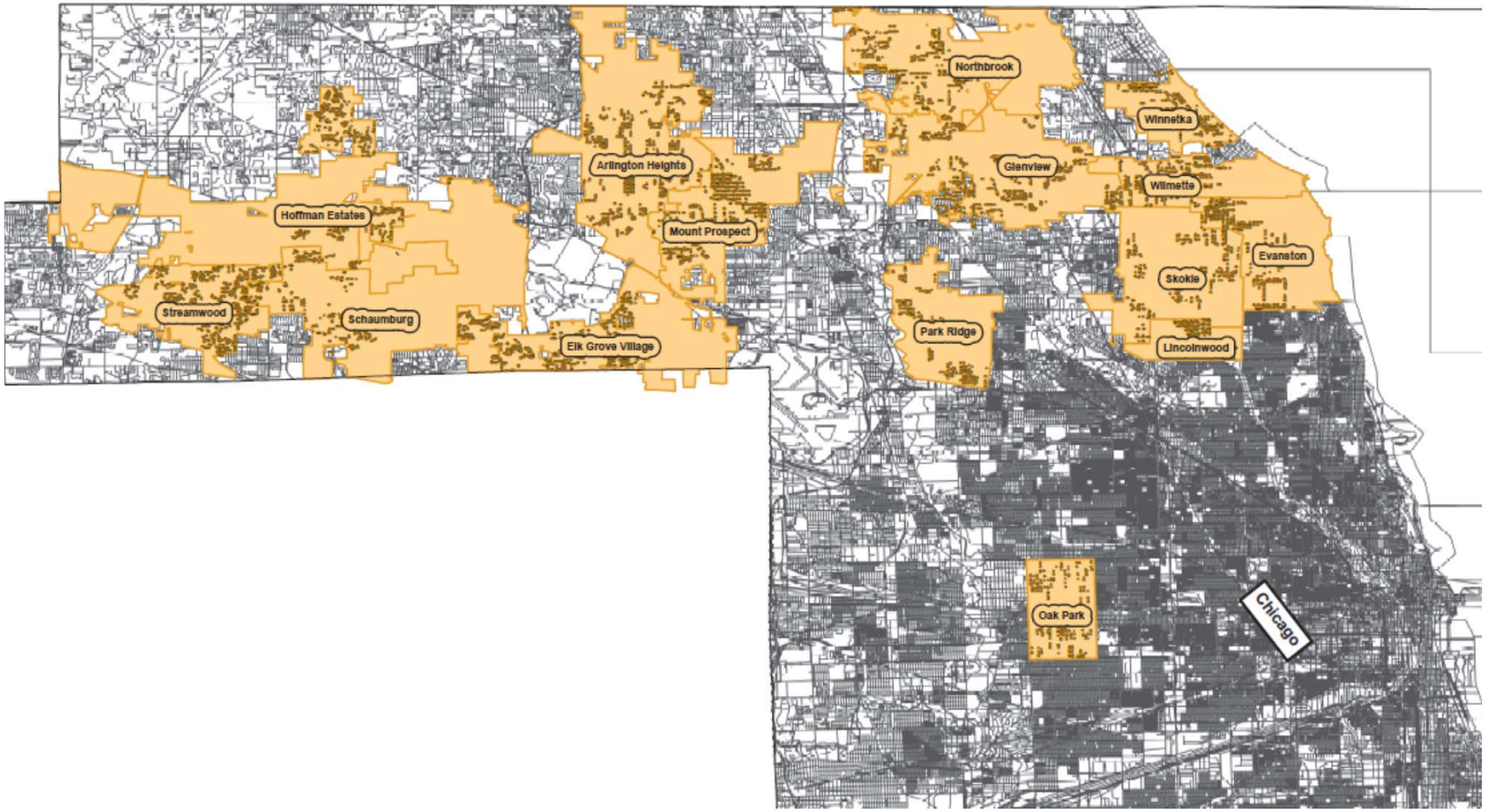
Researchers will visit this address tomorrow (/) between and to conduct a **5 minute survey**.

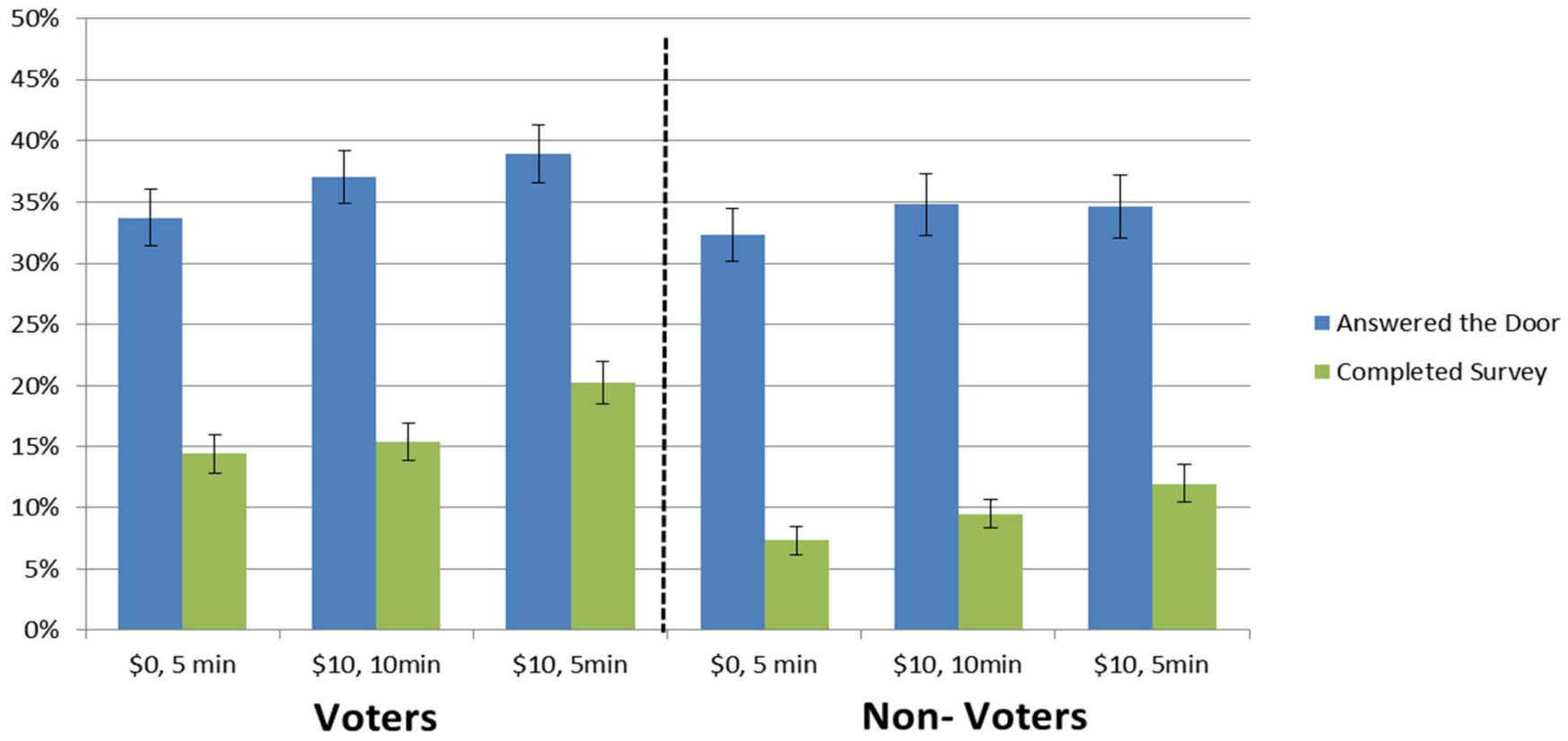
You will be paid **$10 in cash** for your participation.

Map of Locations Reached

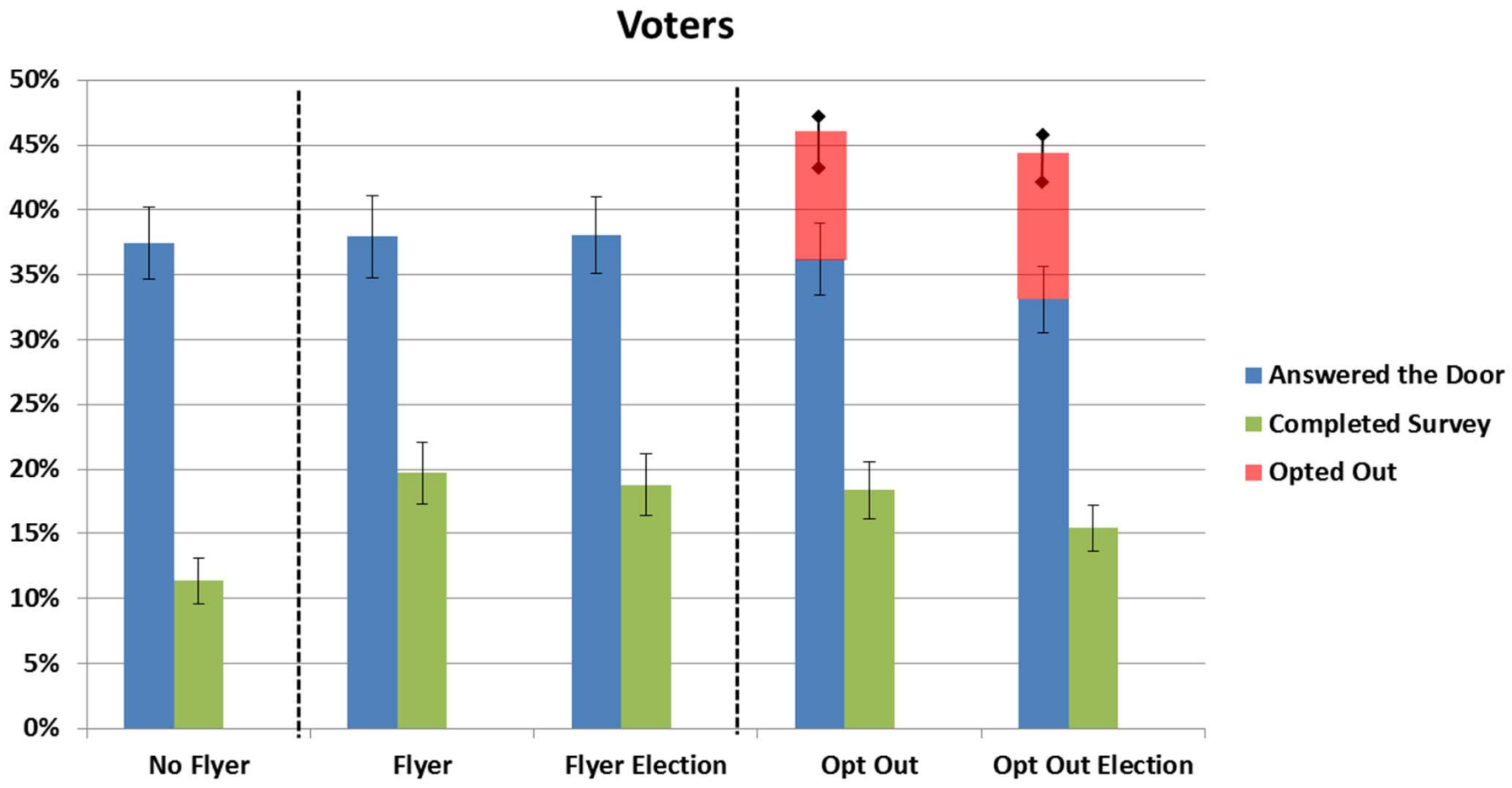
- Single-family homes in towns around Chicago



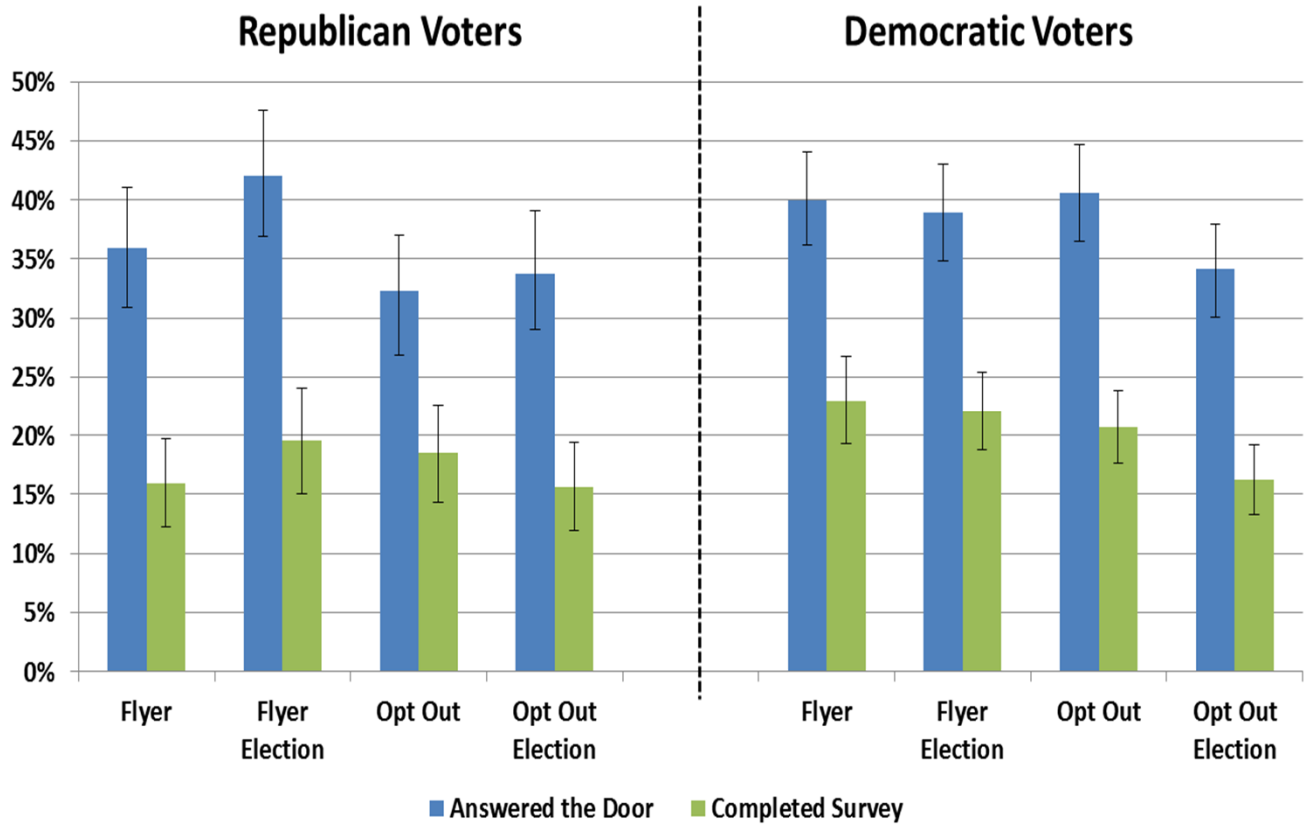
- **Response to Incentives (N = 11,331)**
- Response to payment and duration
- What about sorting in response to election content of survey?



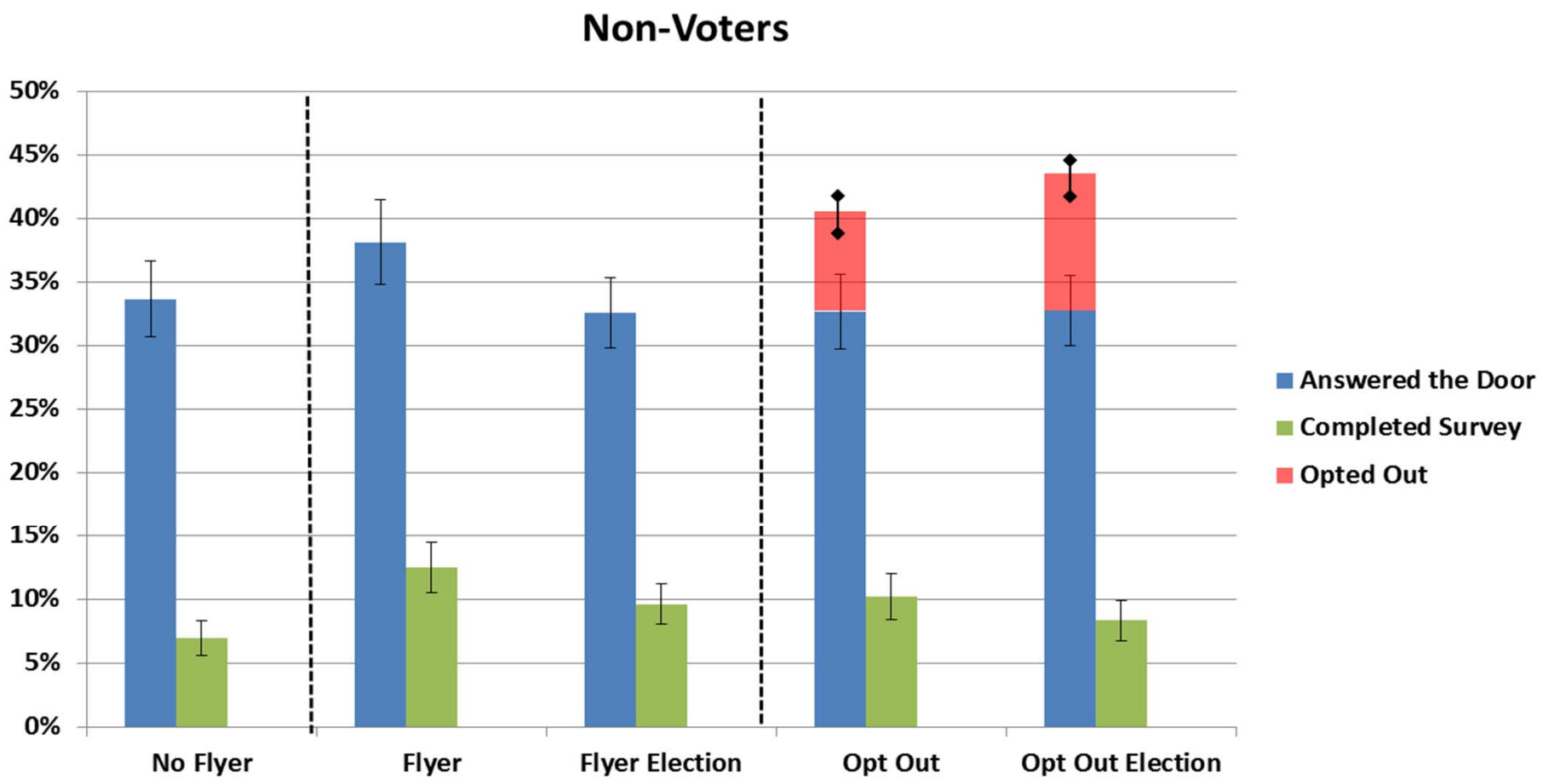
- **Sorting in Response to Election Survey -- Voters**
- Voters -> No evidence of sorting in, some evidence of sorting
- No evidence of pride in voting on average



- **Sorting in Response to Election Survey -- Voters**
- However, 2010 election was low point for democratic voters
- 2/3 of registered voters in towns we reached are Democrats
- What if we split by voting record in primaries?
- Evidence of sorting in for Republicans



- **Sorting in Response to Election Survey – Non-Voters**
- Non-voters-> Strong evidence of sorting out
- Evidence of stigma from not voting and lying costs



Lying Incentives

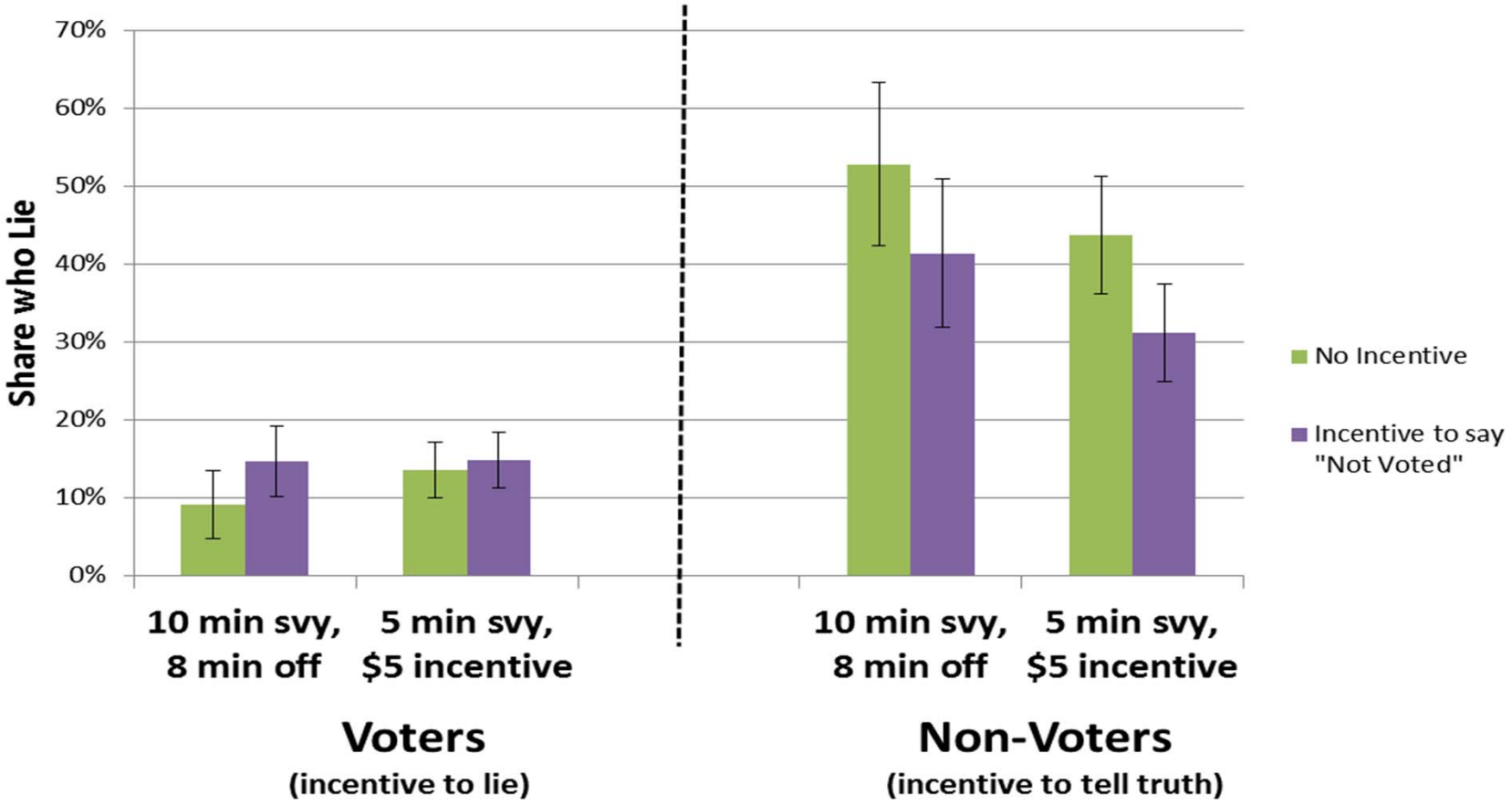
- Additional (crossed) experimental treatment: Incentive to lie in 10-minute survey
- *No Incentive.* Just ask whether voted in 2010 election
- *8-Minute Incentive.* (8 minute incentive to say 'did not vote')
  - We tell treatment households who agree to the (10-min,$10) survey: "**We have 10 minutes of questions about your voter participation in the 2010 congressional election, but if you say that you did not vote then we only have 2 minutes of questions. Either way you answer you will be paid $10.** [Show the end of the survey if answer to #2 is NO]

    Did you vote in the 2010 congressional election?"
  - For voters it is incentive to lie
  - For non-voters this is incentive to tell truth
  - Use this to estimate *counterfactual* utility

Lying Incentives

- In 5-minute surveys:
- *No Incentive.* Just ask whether voted in 2010 election
- *$5 Incentive.* (<u>$5 incentive to say did not vote</u>)
  - We tell households who agree to the (5-min, unpaid or $10) survey: "**We have 5 minutes of questions about your participation in the 2010 congressional election, but if you say that you did not vote then we would like to ask you an extra 1 minute of questions and we will pay you an extra $5 for answering these additional questions** [***IF PAID***: for a total of $15]**. If you say that you voted then we will just ask you the original 5 minutes of questions.** [***IF PAID*:** Either way you answer you will be paid $10.]
  - **Did you vote in the 2010 congressional election?"**
  - As above, incentive to lie for voters, to tell the truth for non-voters

- **Response to Incentives to Say 'Did Not Vote'**
- Small impact on voters: 2 percentage points increase in lying → Strong social image utility and/or lying cost
- Sizeable impact on non-voters: 12 percentage point decrease in lying → Non-voters are closer to indifference



Structural Estimation

- **Structural estimates (Minimum-distance estimator)**

- Minimize distance between predicted moments $m(\vartheta)$ and observed ones $\hat{m}$

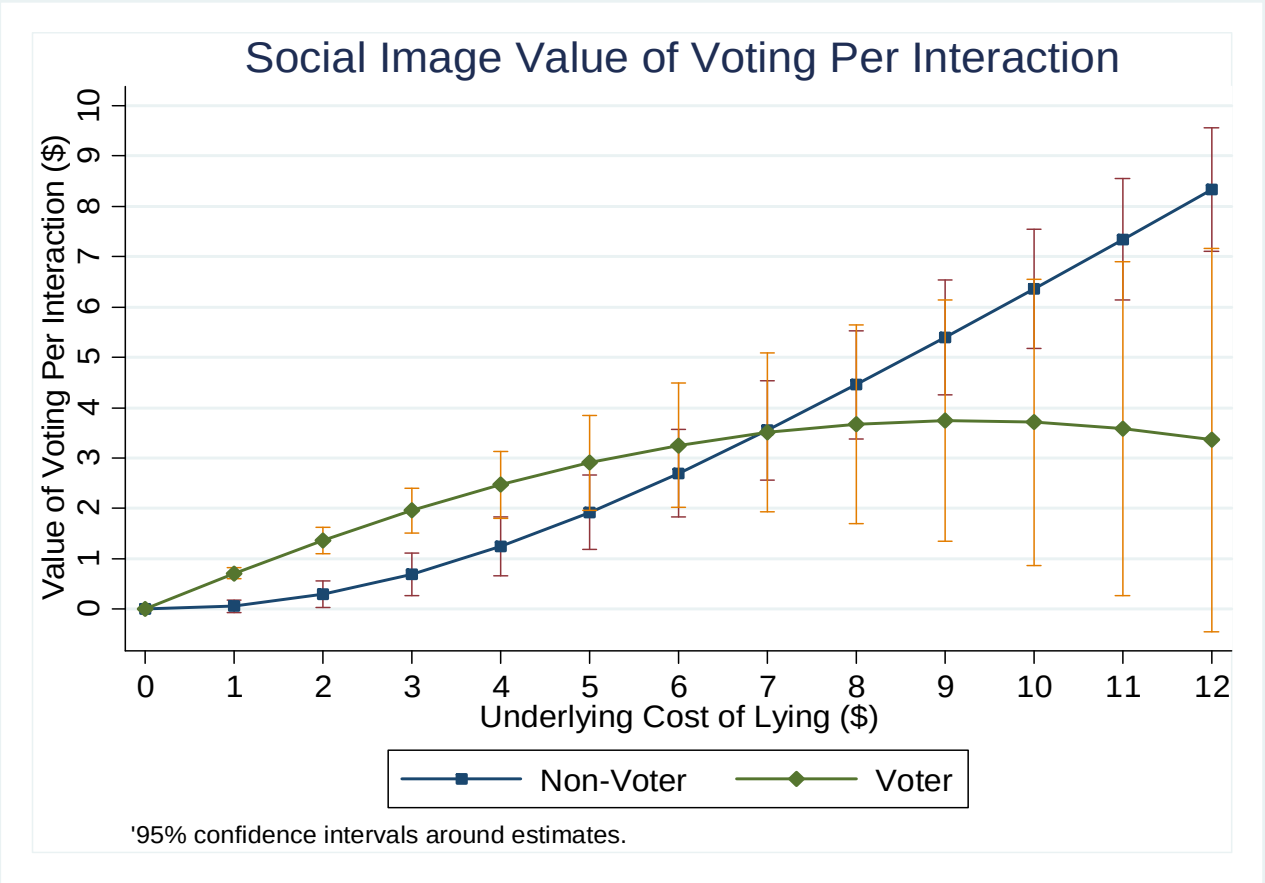
$$\min_{\vartheta} (m(\vartheta) - \hat{m})' W (m(\vartheta) - \hat{m})$$

- Moments $m(\vartheta)$:
  1. Probability of opening door to surveyor $(P(H)_j^S)$
  2. Probability of filling survey $(P(S)_j^S)$
  3. Probability of checking the opt-out box
  4. Probability of lying about voting

- All moments $\hat{P}$ are probabilities, straight from Figures

Election Field Experiment - Estimation

- Cannot identify the lying cost *L*
- Can estimate social image value of voting *as function of L*
- Plot value of voting because asked *once*

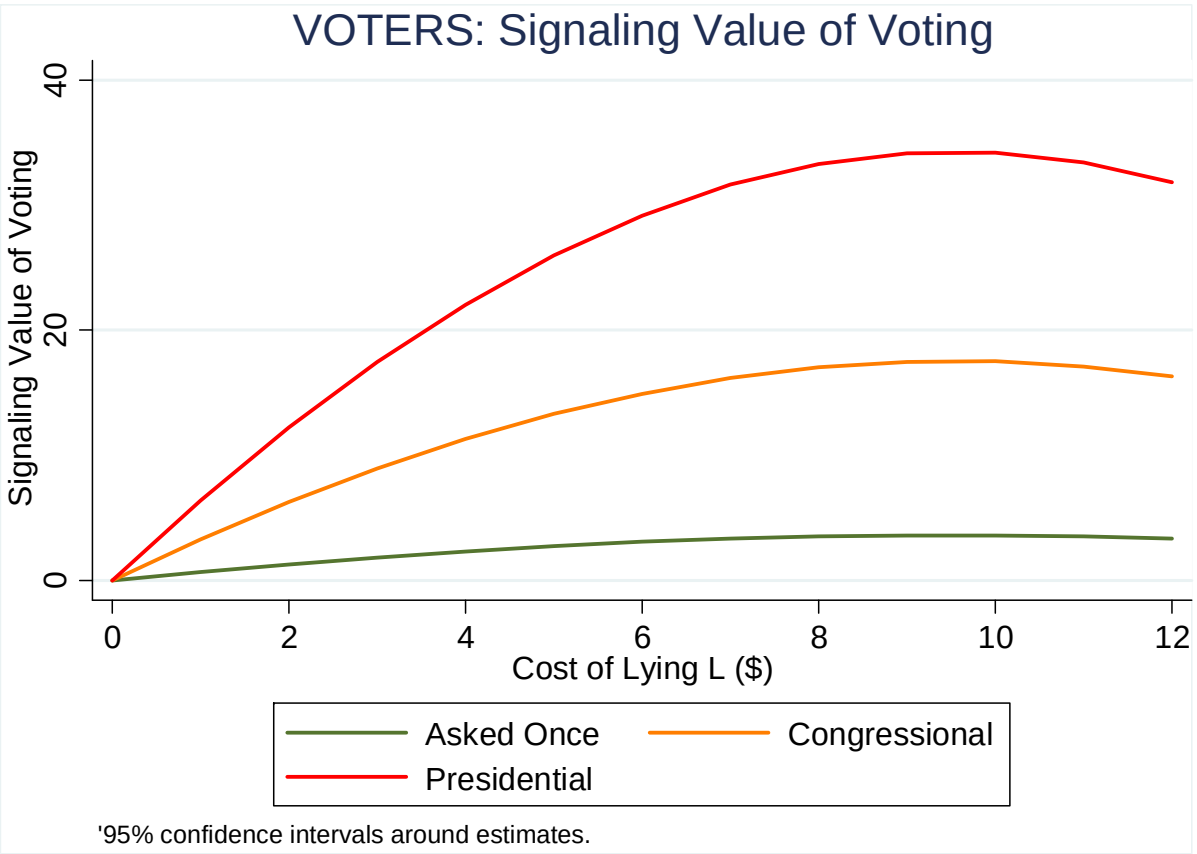


- <u>Voters:</u> Social image value of *one* interaction concave in *L* and between \$1.5 and \$3 for *L* above \$2
- <u>Non-voters</u>: Social image value convex in *L*, below \$1 for *L* below \$4

Election Field Experiment - Estimation

Total value of voting because others ask - Voters:

- Value of *congressional* voting around \$7-\$15 for *L* above \$2
- Value of *presidential* elections likely double (because asked more often)



Full Estimation

- Identify all parameters with additional assumption
- Exclude always-voters and never-voters -- Keep households with predicted voting probabilities [0.25 0.75]
- Assume remaining voters and non-voters have same parameters

Table 5: Subset with Intermediate propensity to vote

Voting Parameters	
Mean Utility from *truthfully* saying voted (sv)	-0.08
	(3.27)
Mean Utility from *truthfully* saying didn't vote (sn)	-4.69
	(3.34)
Cost of Lying (L)	4.65
	(1.08)
Total Signaling Value of Voting	7.66

- Lying cost of $4, social image value of voting of $7.6

Prospective Election Field Experiment

- Test of model: Manipulate the expected number of times asked *N* experimentally → Should affect turnout

- Experiment in week before elections in 2010 and 2012
  - Control (C) group: No contact
  - Control Flyer (CF) group: Flyer reminds households to vote
  - Treatment Flyer (TF) group: Flyer reminds households to vote, AND announces that a surveyor will come by to ask whether they voted in one of the following three weeks

- Comparison of TF group versus CF group

Prospective Election Field Experiment

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Don't forget to vote in the 2012 Presidential Election.

Election Day is Tuesday, November 6, 2012.

- Control Flyer

←

- Treatment Flyer

→

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Researchers will contact you within three weeks of the election (between 11/7 and 11/27) to conduct a survey on your voter participation.

Don't forget to vote in the 2012 Presidential Election.

Election Day is Tuesday, November 6, 2012.

Prospective Election Experiment

Table 7. Results for Get-Out-The-Vote Treatments

Specification:	OLS Regressions			
Dependent Variable:	Indicator for Voting in Election in Year t			
Election:	Congressional Elections in Nov. 2010		Presidential Elections in Nov. 2012	
	(1)	(2)	(3)	(4)
Constant	0.6000***		0.7312***	
	(0.0109)		(0.0033)	
Flyer with Voting Reminder	-0.0020	-0.0031	0.0060	0.0046
	(0.0152)	(0.0083)	(0.0056)	(0.0034)
Flyer with Announcement Will Ask About Voting	0.0120	0.0102	0.0023	0.0056
	(0.0157)	(0.0084)	(0.0056)	(0.0034)
Omitted Treatment	No Flyer		No Flyer	
Control for past Voting since 2004		X		X
Difference (Flyer Will Ask - Flyer Reminder)	0.0140	0.0133	-0.0037	0.0010
p-value for test of equality, 2-sided	p=0.365	p=0.120	p=0.561	p=0.811
p-value for test of equality, 1-sided	p=0.182	p=0.060*		p=0.405
R2	0.0001	0.4024	0.0000	0.3251
N	N = 31,306	N = 31,304	N = 93,805	N = 93,805

- 1.3pp. effect in 2010 (marg. Significant 1-sided)
- 0.1pp. Effect in 2012 (highly competitive election)

Conclusion

- Model of voting: "*because others ask*"
  - → Voting in anticipation of being asked about voting
  - → Voting decision takes into account social image utility
- We designed a field experiment to test mode
  - Sorting in/out of home when informed about voting question
  - Lying about voting when incentivized
  - GOTV intervention: expecting to be asked
- Value of voting due to this signaling motive is estimated to be sizeable
  - $10-$15 for congressional elections
  - $15-$25 for presidential elections (if parameters are same)
  - Plausibly significant impact on voting
- Model allows for measurement of value of voting

7 Next Lecture

- More Market Response to Biases
  - Investors: Behavioral Finance
  - Behavioral Institutional Design