

Econ 2230: Public Economics

Lecture 22: Matching

Last

1. Tax subsidy
 - a) Characterizing the US deduction for charitable donations
 - b) Optimal subsidy
 - c) Intended and unintended consequences
 - d) Price elasticity of giving
 - e) Salience



2. Matching

- ▶ A match typically more salient – individuals know what the consequences are
- ▶ Government provided incentives typically provided in the form of deductions.
- ▶ Private incentives in the form of matches
 - ▶ Announced by the non-profit
 - ▶ Provided by the firm as a employer benefit
- ▶ Outline
 - a. Are rebates and subsidies equivalent?
 - ▶ Eckel and Grossman (2003)
 - b. How does the magnitude of the match influence giving?
 - ▶ Meier (2007)
 - ▶ Karlan and List (2007), Karlan, List, and Shafir (2010)
 - c. Reconciling evidence from experimental and non-experimental data



2.a. Match vs subsidy

- ▶ Eckel and Grossman (2003)
 - ▶ investigate how donors respond to variation in their initial income and price of giving (Andreoni & Miller, 2002; Andreoni & Vesterlund, 2001)
 - ▶ decision maker allocates money between herself and a charity of her choice (make it more similar to the deductions)
 - ▶ International charities (African Christian Relief, Doctors Without Borders, and Feed The Children)
 - ▶ National charities (I Have A Dream Foundation);
 - ▶ Local organizations (Women's Haven of Tarrant County and American Red Cross, Tarrant County Chapter).
 - ▶ Health (AIDS Outreach Center and Cancer Care Services)
 - ▶ Environmental (Earth Share Texas)
 - ▶ Social service charities (YMCA of Arlington).
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2.a. Match vs subsidy

- ▶ Eckel and Grossman (2003)
 - ▶ present participants with a series of subsidies and comparable matches
 - ▶ Match or subsidy
 - ▶ Endowment: 40, 60, 75, or 100 tokens
 - ▶ Rebate: 20, 25, and 50%
 - ▶ Match rates: 25, 33, and 100%.
 - ▶ Cost to the subject of contributing \$1 to the charity: \$1, \$0.80, \$0.75, and \$0.50



Eckel and Grossman, 2003

- ▶ Equivalent matches and rebates:
 - ▶ Rebate, r :
 - ▶ Max $U(x,g)$
 - ▶ s.t. $x + (1-r)g = w$
 - ▶ FOC: $MRS = 1-r$
 - ▶ Match, m :
 - ▶ Max $U(x,(1+m)g)$
 - ▶ s.t. $x + g = w$
 - ▶ FOC: $(1+m)MRS = 1$
- ▶ Contributions are the same under r' and m' when $1-r' = 1/(1+m')$
- ▶ E.g. match of 25 and rebate of 20: $0.8 = 1/1.25$



Table 1: Sample allocation decision problems for the control treatment.

(1) <i>Problem</i>	(2) <i>Endowment</i>	(3) <i>Condition</i>	(4) <i>Hold</i> <i>(for myself)</i>	(5) <i>Pass</i> <i>(to charity)</i>
1	\$8	For every \$1 you pass, the Charity will receive \$1.		
2	\$8	For every \$1 you pass, <u>the Charity will receive \$2: your \$1 and a matching \$1 provided by the experimenter.</u>		
3	\$8	For every \$1 you pass, the Charity will receive \$1, and, the experimenter will refund to you \$.50.		

Table 1: Sample allocation decision problems for the control treatment.

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Table 3

Gross token contributions to charity (%) (sample size=135)

(1) Endowment	(2) Price of giving \$1 to charity	(3) % tokens contributed under rebate subsidy	(4) % tokens that would be contributed for equivalent allocation under matching subsidy ^a	(5) % tokens actually contributed under matching subsidy	(6) Rebate vs. equivalent matching means test <i>P</i> -value ^b (4) vs. (5)
\$4.00	\$0.50	55.4 (28.8)	27.7 (14.4)	51.9 (31.8)	0.001
	\$0.80	50.5 (32.8)	40.4 (26.2)	52.9 (33.0)	0.001
\$6.00	\$0.75	50.8 (30.3)	38.1 (22.8)	47.0 (31.4)	0.001
\$7.50	\$0.50	52.3 (30.4)	26.2 (15.20)	51.4 (31.5)	0.001
	\$0.75	51.8 (30.9)	38.9 (23.2)	47.1 (31.0)	0.001

^a Calculated as $(1 - s_r)$ multiplied by the % of tokens passed under the rebate subsidy (3).^b One-tailed tests.

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^b One-tailed tests.

Table 4

Net dollar contributions to charities (sample size = 135)

(1) Endowment	(2) Price of giving \$1 to charity	(3) Rebate subsidy	(4) Matching subsidy	(5) No subsidy	(6) Matching vs. rebate Means test <i>P</i> -value*
\$4.00	\$0.50	\$2.22 (1.15)	\$4.10 (2.55)	–	0.001
	\$0.80	\$2.02 (1.31)	\$2.64 (1.65)	–	0.001
\$6.00	\$0.75	\$3.05 (1.82)	\$3.76 (2.51)	–	0.001
	\$1.00	–	–	\$2.84 (1.96)	–
\$7.50	\$0.50	\$3.92 (2.28)	\$7.71 (4.73)	–	0.001
	\$0.75	\$3.89 (2.32)	\$4.71 (3.10)	–	0.003
\$10.00	\$1.00	–	–	\$4.87 (3.22)	–

* One-tailed test.

Eckel and Grossman, 2003

- ▶ Match and subsidy not perceived the same
- ▶ Donors presented with a match contribute 1.2 – 2 times more than those presented with the equivalent subsidy
- ▶ Similar results shown by Eckel and Grossman (2006ab), Davis et al. (2005), and Davis and Millner (2005)

- ▶ Davis and Millner (2005):
 - ▶ charity receipts were twice as high under the 100% matching subsidy than under the 50% refund condition
 - ▶ argue confusion-based-constant pass rule



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\$4.00	\$0.50	55.4 (28.8)	27.7 (14.4)	51.9 (31.8)	0.001
	\$0.80	50.5 (32.8)	Contribute 50%	52.9 (33.0)	Contribute 50%
\$6.00	\$0.75	50.8 (30.3)		47.0 (31.4)	
\$7.50	\$0.50	52.3 (30.4)		51.4 (31.5)	
	\$0.75	51.8 (30.9)	38.9 (23.2)	47.1 (31.0)	0.001

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^b One-tailed tests.



Match vs. subsidy

- ▶ Going back to our initial question. Does giving respond to salient price changes?



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\$6.00	\$0.75	\$3.05 (1.82)	\$3.76 (2.51)	–	0.001
	\$1.00	–	–	\$2.84 (1.96)	Contribute 50%
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	\$0.75	\$3.89 (2.32)	\$4.71 (3.10)	–	
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			6 (1)	-	0.001
\$10.00	\$1.00		1 (3)	\$2.84 (1.96)	-
			1 (1)	-	
		(2.32)	(3.10)	-	
		-	-	\$4.87 (3.22)	-

Davis (2006): Isolation effect - subjects focus only on their nominal contribution ignoring subsidy

\$2.84
(1.96)

Contribute
50%

\$4.87
(3.22)

* One-tailed test.



Robust?

- ▶ Eckel and Grossman (2006b)
 - ▶ between-subject design to reduce the possibility of subjects confusing the two different subsidy methods. Subjects encounter only one subsidy type. Same result.
- ▶ Eckel and Grossman (2006a)
 - ▶ Subjects allowed to choose between a 50 percent rebate subsidy and a 100 percent matching subsidy. Rebate and match equally likely to be picked...total donations under the match significantly higher than under the rebate subsidy. Same result
- ▶ Davis, et al. (2005)
 - ▶ within-subjects design + tables detailing the consequences of all possible giving alternatives. Same result (smaller difference)
- ▶ Davis and Millner (2005)
 - ▶ within-subjects design with private good (chocolate bars) instead of charitable donation). Evidence of constant contribution behavior from the subjects, subjects seem to prefer matching subsidies to rebate subsidies; participants purchased significantly more chocolate bars under the matching sales format.



Match vs. rebate

- ▶ Preference hypothesis:
 - ▶ E.g. Benabou and Tirole (2006) suggest this tendency is consistent with the idea of warm glow effect of giving. Donors prefer a matching subsidy over a rebate because they feel “greedy” accepting rebates from their donation, and this reduces the utility gained from any donation. Matching subsidies do not have this effect
- ▶ Isolation effect or confusion-based-constant pass rule
- ▶ See also Lukas, Grossman and Eckel (2011)



Meier, 2007

- ▶ Examine long run effects of short term matching incentives
- ▶ Donation to one or two university funds
- ▶ Match offered if contribute to both: “If you contribute to both social funds, an anonymous donor matches your contribution with “CHF 3 (25%)” or “CHF 6 (50%)”

- ▶ Possible effects after match removed
 - ▶ Return to pre-match contribution levels
 - ▶ Sustain giving seen under match
 - ▶ Decrease giving below pre-match contribution level if match crowds out incentive to give



Meier, 2007

TABLE 1. Summary statistics in period t .

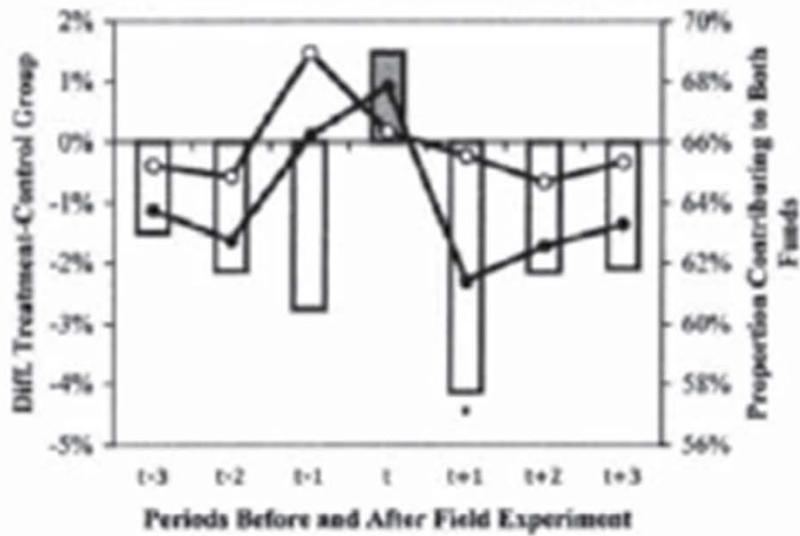
Personal Characteristics	Control Group	Treatment "Matching 25%"	Treatment "Matching 50%"
Observations	10,847	265	267
Number of semesters	11.9 (8.5)	11.3 (8.3)	11.3 (7.4)
Age	28.3 (7.4)	28.5 (7.7)	28.0 (7.8)
Gender (= Female)	52%	53%	50%
Economists	10%	9%	12%
Average donation in the past	8.37 (4.61)	8.04 (4.75)	8.34 (4.53)

Source: Own experiment and data provided by the accounting department of the University of Zurich.

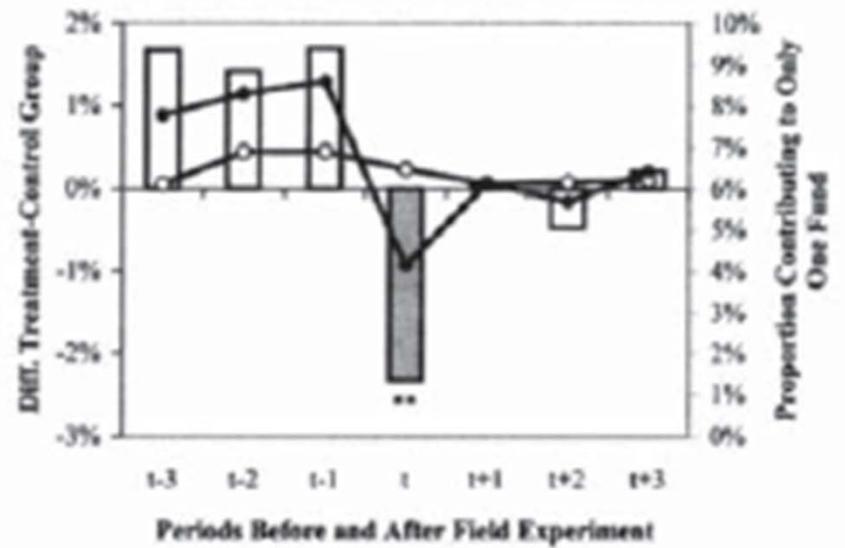
Note: Standard deviations in parentheses.



1a: Treatment Effect on Contributions to Both Funds Over Time

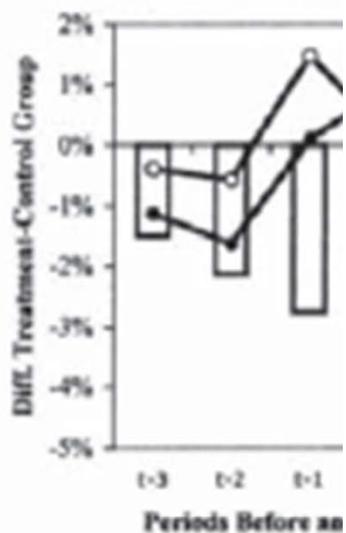


1b: Treatment Effect on Contributions to Only One Fund Over Time



- Legend:
- Difference between Treatment and Control (left axis)
 - Treatment group (right axis)
 - Control group (right axis)

1a: Treatment Effect on Contributions to Both Funds Over Time

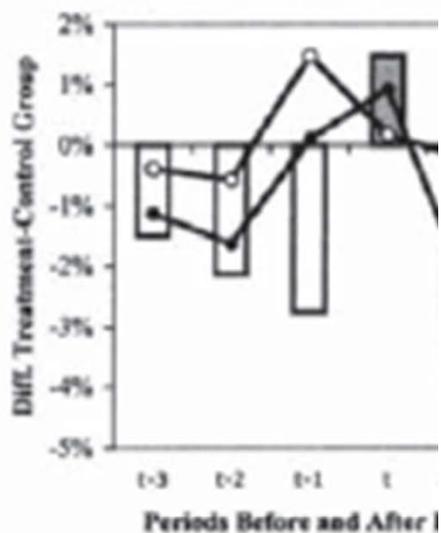


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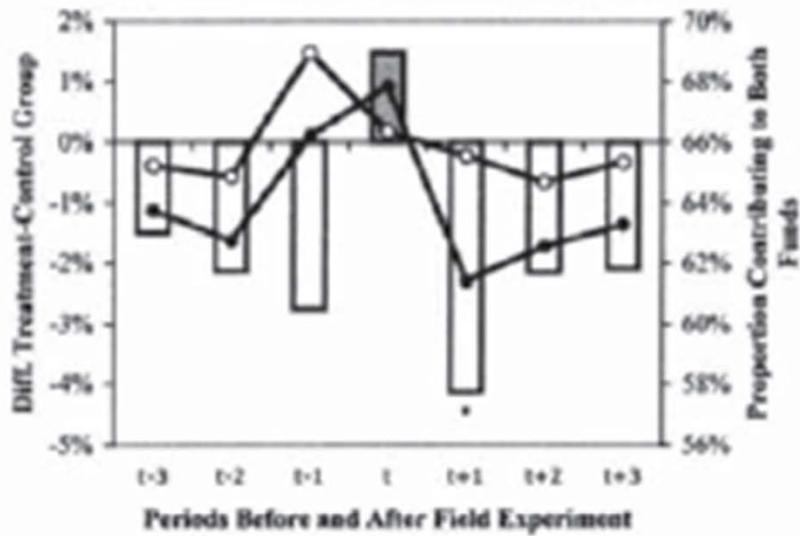


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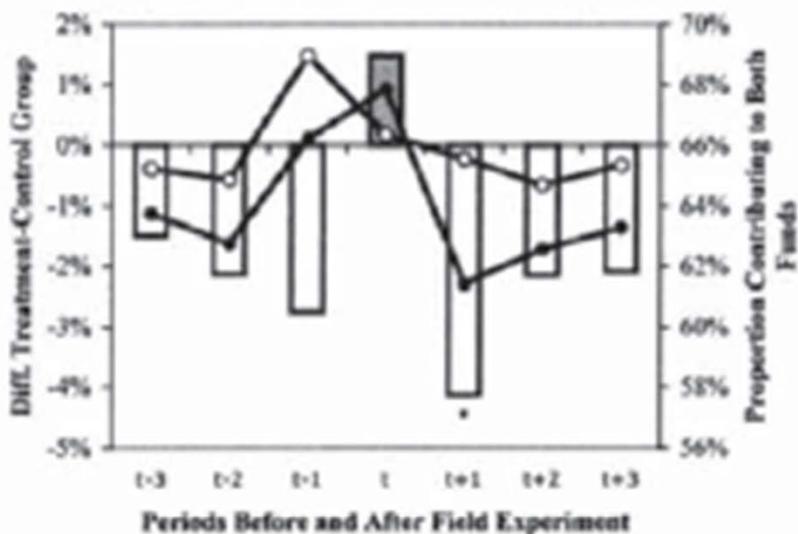
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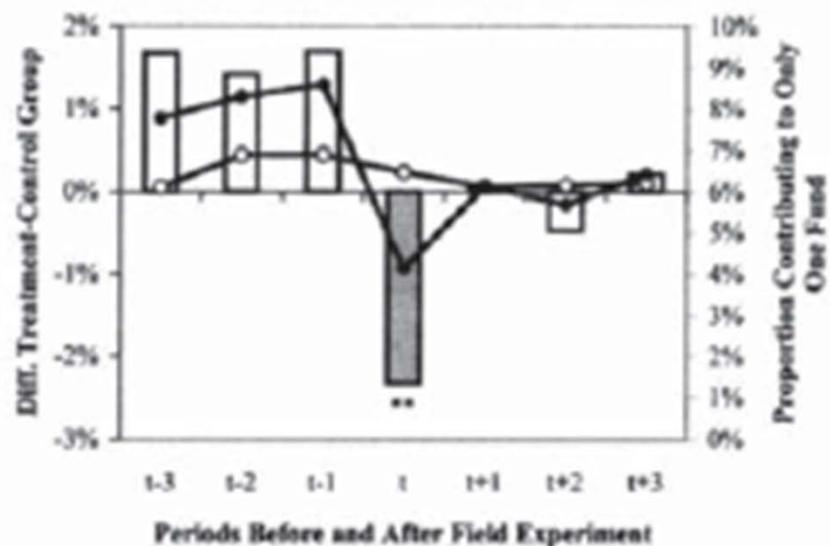
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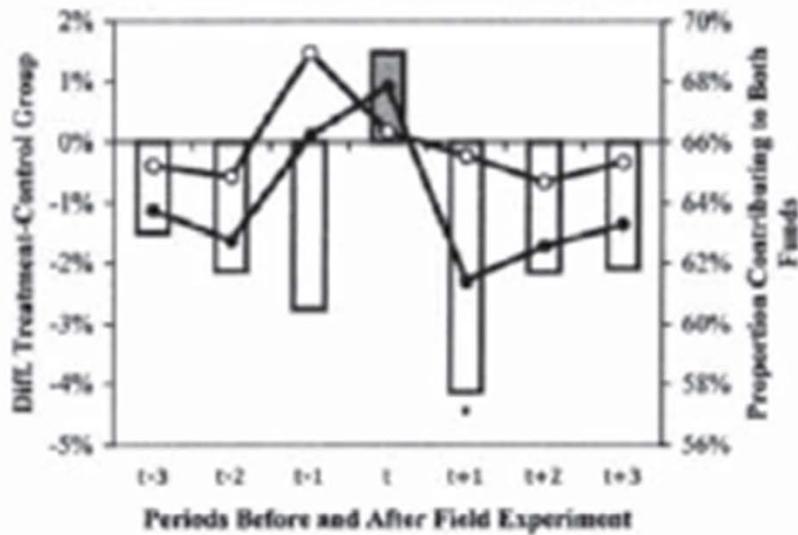


1b: Treatment Effect on Contributions to Only One Fund Over Time

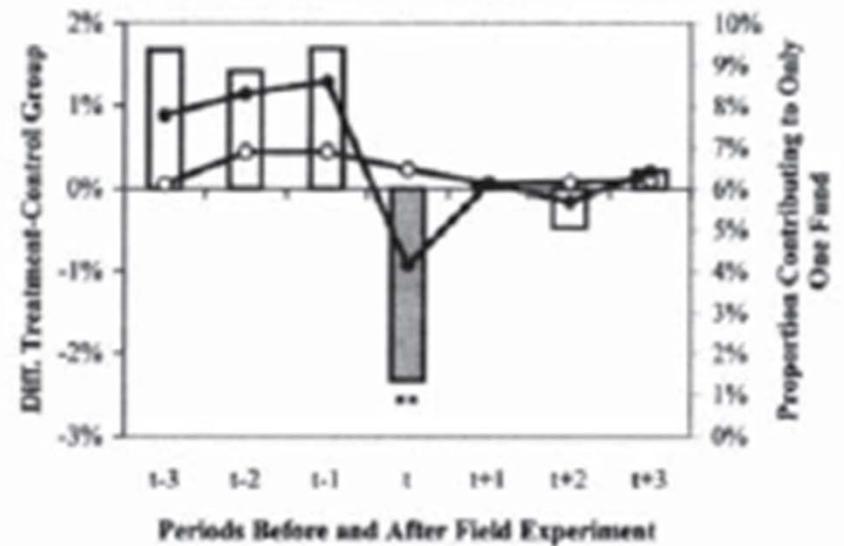


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1b: Treatment Effect on Contributions to Only One Fund Over Time

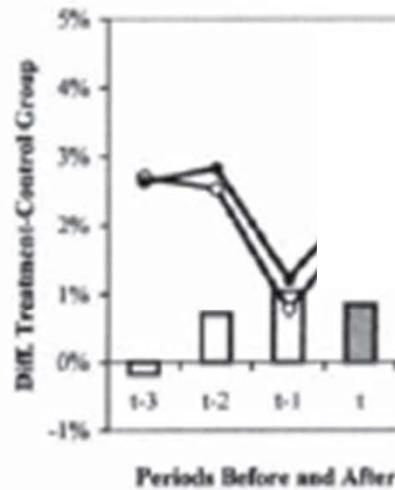


Legend

- Treatment year: Contribution to two funds increase and contribution to one fund decreases
- After treatment: don't return to one fund



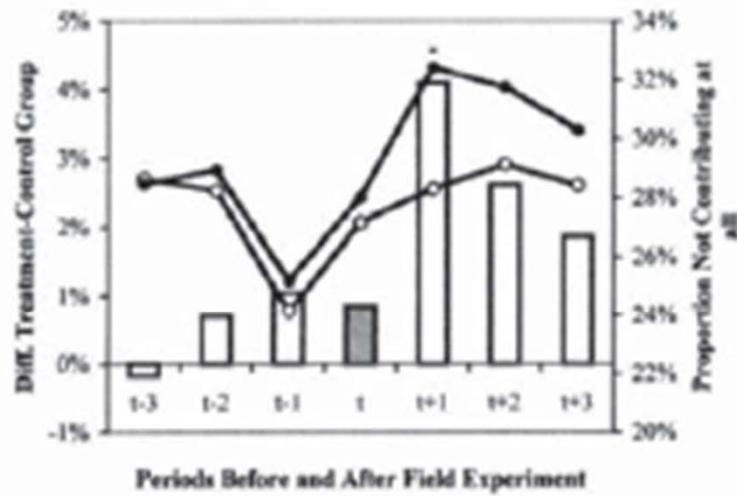
Ic: Treatment Effect on No Contribution at all Over Time



Id: Treatment Effect on Average Donations Over Time

- Legend:
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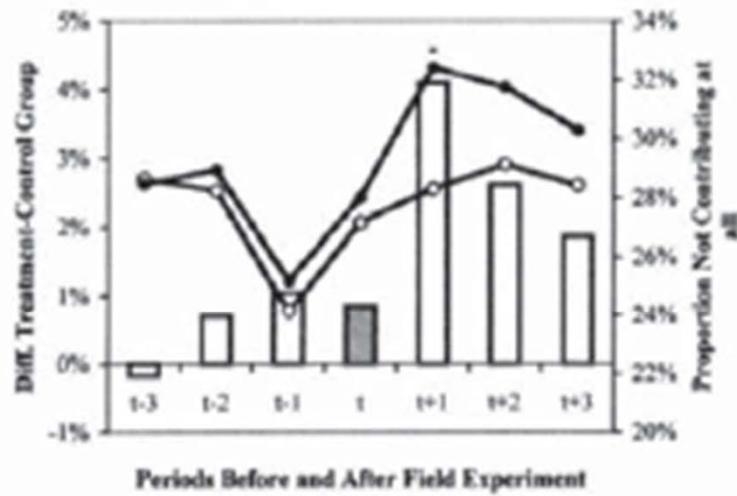
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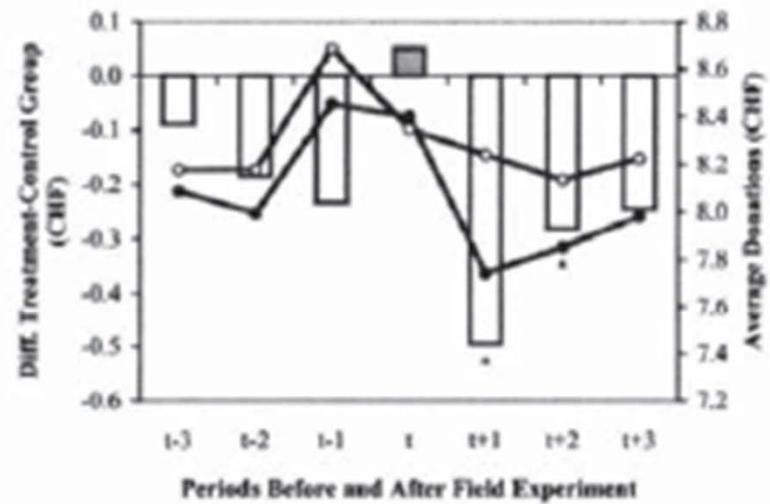
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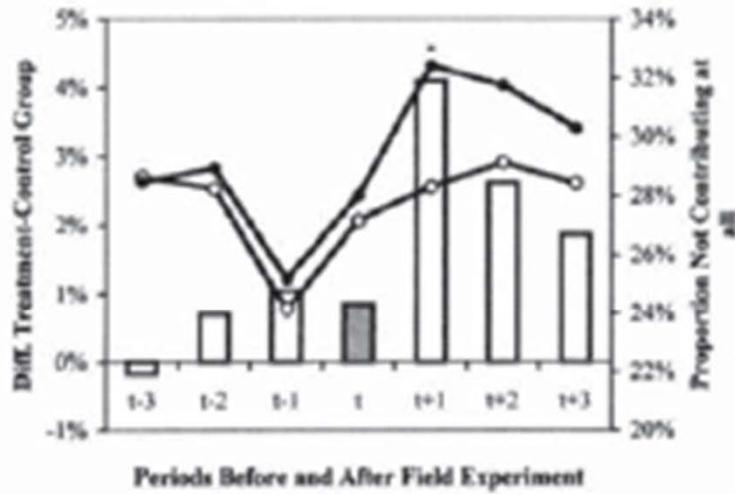


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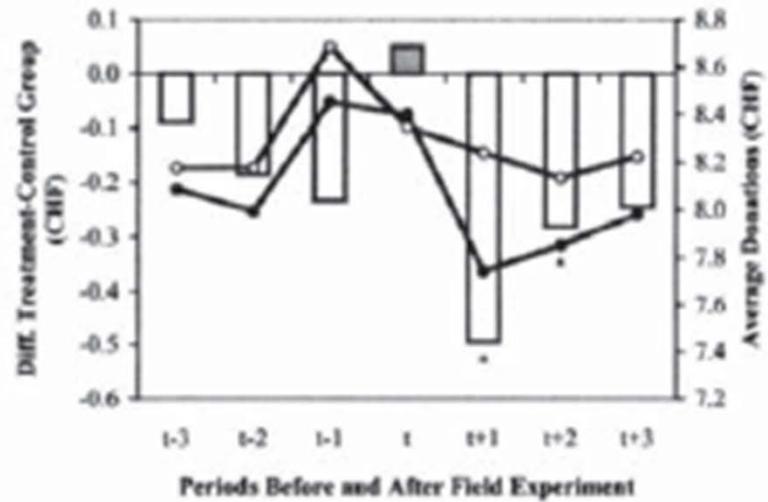


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- After treatment: less likely to make positive contribution
- Average contribution lower after treatment

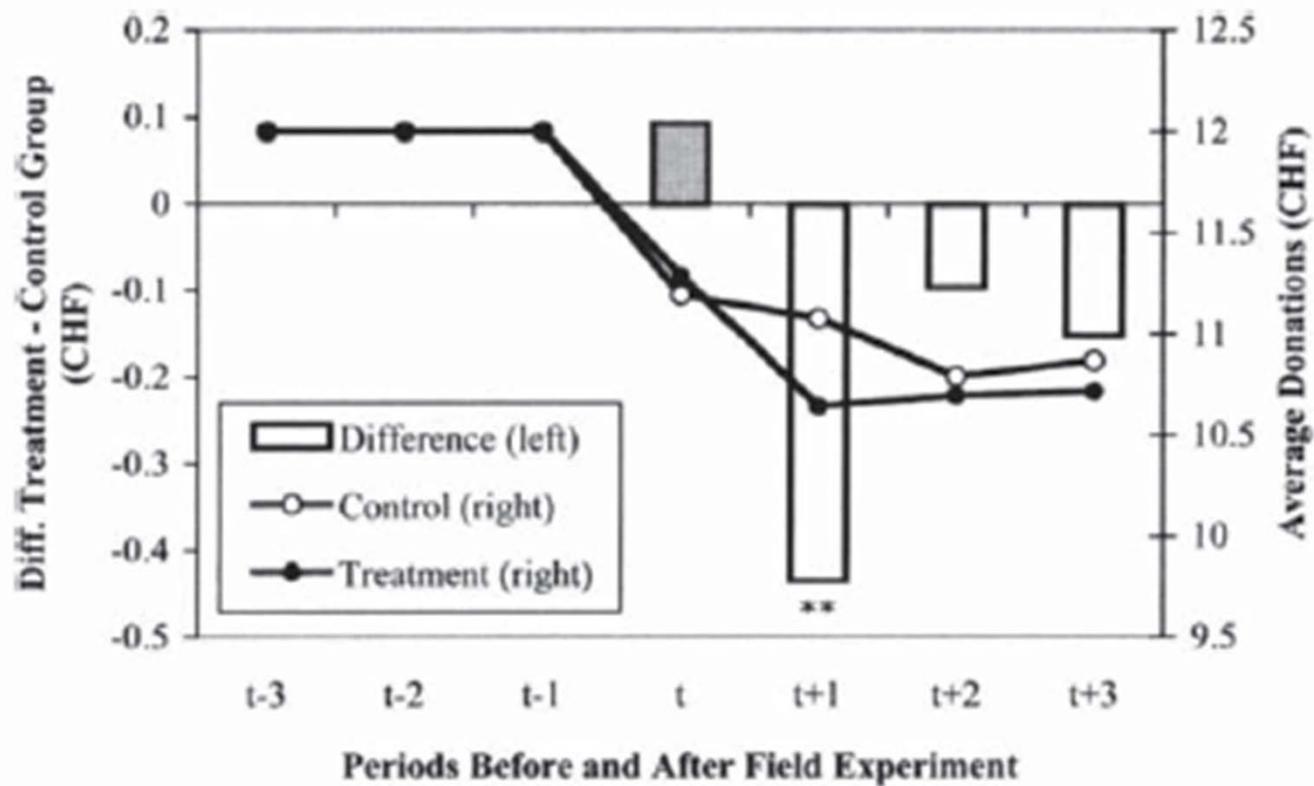
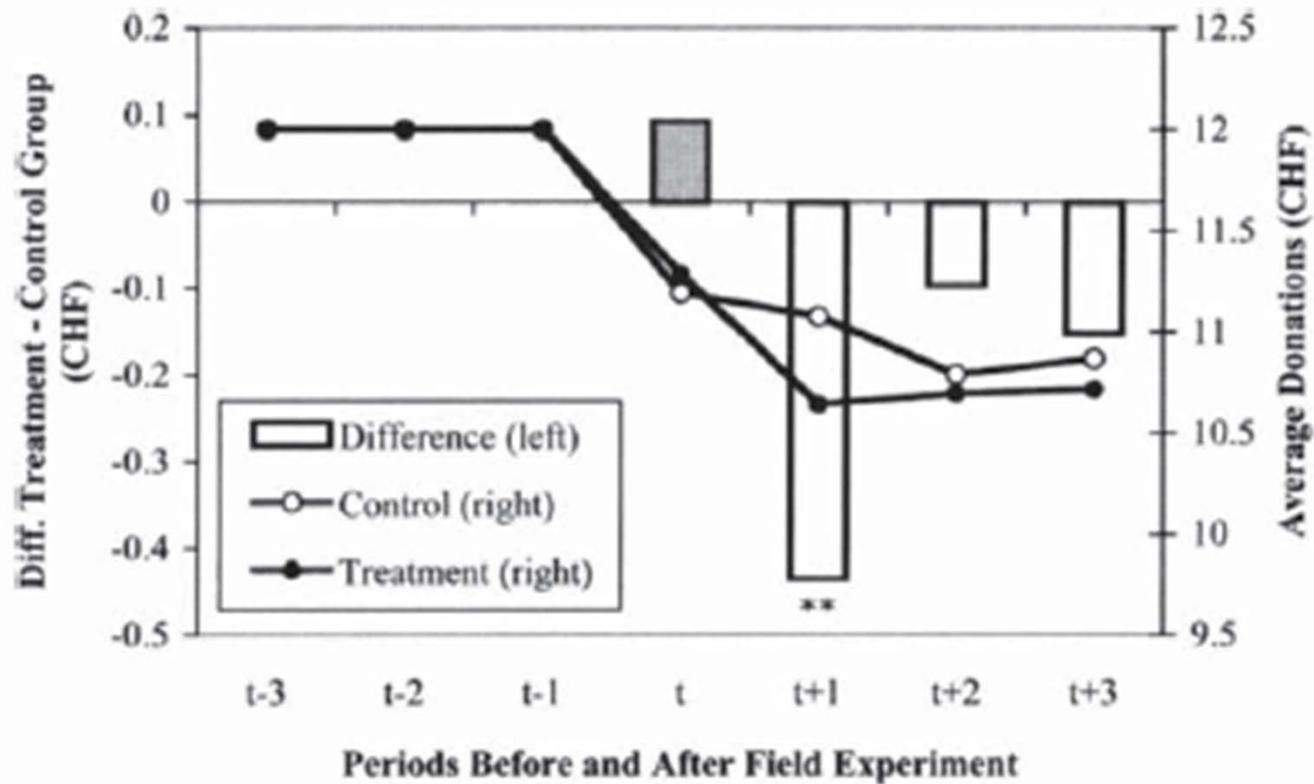


FIGURE 2. Average donations for subjects who contributed the maximum amount in the past.

Source: University of Zurich, 2000–2004.

Level of significance: *Significant at $0.1 < p < 0.05$. **Significant at $0.01 < p < 0.05$. ***Significant at $p < 0.01$.



- Max contributors: Greater decrease for treated group suggest not simply intertemporal substitution.

Meier, 2007

- ▶ Match
- ▶ Has short term positive effects
- ▶ Long term negative effects:
 - ▶ negative effect on the participation rate
 - ▶ willingness to contribute may be undermined by the temporary incentive to give



Karlan and List (2007)

- ▶ large scale natural field experiment involving “a capital campaign for a liberal politically-oriented non-profit that focuses on social issues and civil liberties”
- ▶ Determine the effect of matching contributions
- ▶ Mail solicitations to 50,000 supporters using different treatments
 - ▶ control (no-subsidy)
 - ▶ matching subsidies at varying rates
 - ▶ \$1 for \$1 match
 - ▶ \$2 for \$1 match
 - ▶ \$3 for \$1 match



MATCHING GRANT NOW IS THE TIME TO GIVE!

Troubled by the continued erosion of our constitutional rights, a concerned member has offered a matching grant [4 treatments: of \$25,000; of \$50,000; of \$100,000; blank] to encourage you to contribute to [redacted] at this time. To avoid losing the fight to defend our [redacted], this member has announced the following match: [3 treatments: \$1; \$2; \$3] for every dollar you give. So, for every [3 treatments: HPC*1.00; HPC*1.25; HPC*1.50] you give, [redacted] will actually receive [\$x]. Let's not lose this match—please give today!



TABLE 2A—MEAN RESPONSES
(Mean and standard errors)

	Control	Treatment	Match ratio		
			1:1	2:1	3:1
Implied price of \$1 of public good:	1.00	0.36	0.50	0.33	0.25
<i>Panel A</i>	(1)	(2)	(3)	(4)	(5)
Response rate	0.018 (0.001)	0.022 (0.001)	0.021 (0.001)	0.023 (0.001)	0.023 (0.001)
Dollars given, unconditional	0.813 (0.063)	0.967 (0.049)	0.937 (0.089)	1.026 (0.089)	0.938 (0.077)
Dollars given, conditional on giving	45.540 (2.397)	43.872 (1.549)	45.143 (3.099)	45.337 (2.725)	41.252 (2.222)
Dollars raised per letter, not including match	0.81	0.97	0.94	1.03	0.94
Dollars raised per letter, including match	0.81	2.90	1.87	3.08	3.75
Observations	16,687	33,396	11,133	11,134	11,129

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	Control	Treatment	Match ratio		
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Implied price of \$1 of public good:	1.00	0.36	0.50	0.33	0.25
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Dollars given, unconditional	0.813 (0.063)	0.967 (0.049)	0.937 (0.089)	1.026 (0.089)	0.938 (0.077)
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Dollars raised per letter, not including match	0.81	0.97	0.94	1.03	0.94
Dollars raised per letter, including match	0.81	2.90	1.87	3.08	3.75
Observations	16,687	33,396	11,133	11,134	11,129



TABLE 2A—MEAN RESPONSES
(Mean and standard errors)

	Control	Treatment	Match ratio		
			1:1	2:1	3:1
Implied price of \$1 of public good:	1.00	0.36	0.50	0.33	0.25
<i>Panel A</i>	(1)	(2)	(3)	(4)	(5)
Response rate	0.018 (0.001)	0.022 (0.001)	0.021 (0.001)	0.023 (0.001)	0.023 (0.001)
Dollars given, unconditional	0.813 (0.063)	0.967 (0.049)	0.937 (0.089)	1.026 (0.089)	0.938 (0.077)
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Karlan and List, 2007

- ▶ Findings:
 - ▶ Matching subsidy significantly increases
 - ▶ likelihood of contributing (by 22%)
 - ▶ amount given (by 19%).
 - ▶ Increasing subsidy amount above the 1:1 match does not further affect contributions.

- ▶ Similar to scaling effect (Kahneman and Knetsch, 1992). Scaling effects may critically undermine willingness to pay elicitation in contingent valuation studies [report the same willingness to pay to clean up Lake Ontario as the entire Great Lakes]



Karlan, List, and Shafir (2010)

- ▶ Examine smaller matches (1:1 and 1:3)
 - ▶ a liberal organization that focuses on civil justice issues. Although the organization is different, it is of similar spirit to the organization used in Karlan and List (2007).
 - ▶ Contacted 20,000 individuals who had previously contributed
- ▶ Findings:
 - ▶ Giving patterns are the same across the 1:3 vs 1:1 match
 - ▶ Neither match influences giving
 - ▶ Warm vs. cold list donor: warm list donors respond more favorably to match funds than cold list agents



2.c. Reconciling the difference in experimental and non-experimental data

- ▶ Experimental studies (lab and field)
 - ▶ Response to subsidies/rebate smaller than response to matches
 - ▶ Response to salient incentives to give rather limited
- ▶ How do we reconcile these findings with the non-experimental evidence that charitable deductions decrease with the price of giving (i.e., marginal tax rate)?
- ▶ Charitable donations may be used for tax evasion – of particular concern on non-cash gifts



Non-cash gifts

- ▶ Tax deduction may be obtained for donations of property
- ▶ Property types: Securities, art and collectibles, real estate and easements, computers and office equipment and supplies, Vehicles, new and used clothing and household items, food and drugs, inventory property of businesses, intellectual property such as patents and personal papers.
- ▶ Can deduct the fair market value of the donated property
- ▶ Noncash gift (2005)
 - ▶ 25.4 million itemizing taxpayers reported \$48.1 billion in deductions for noncash charitable contributions,
 - ▶ \$41.1 billion of the contributions were from the 6.6 million donors who made at least \$500 in noncash gifts. These donations resulted in a tax expenditure of over \$9 billion for 2005.



2.c. Charitable deduction used for tax avoidance

- ▶ Non-cash gifts
 - ▶ <\$250 no receipt from charity required
 - ▶ \$250-\$500 receipt must be obtained but need not be attached
 - ▶ \$500+ must submit documentation
 - ▶ \$5,000 a qualified appraisal needed
- ▶ Ackerman & Auten (2008)
 - ▶ Examine characteristics of non-cash gifts



FIGURE 1:
DISTRIBUTION OF NONCASH DEDUCTIONS, 2005

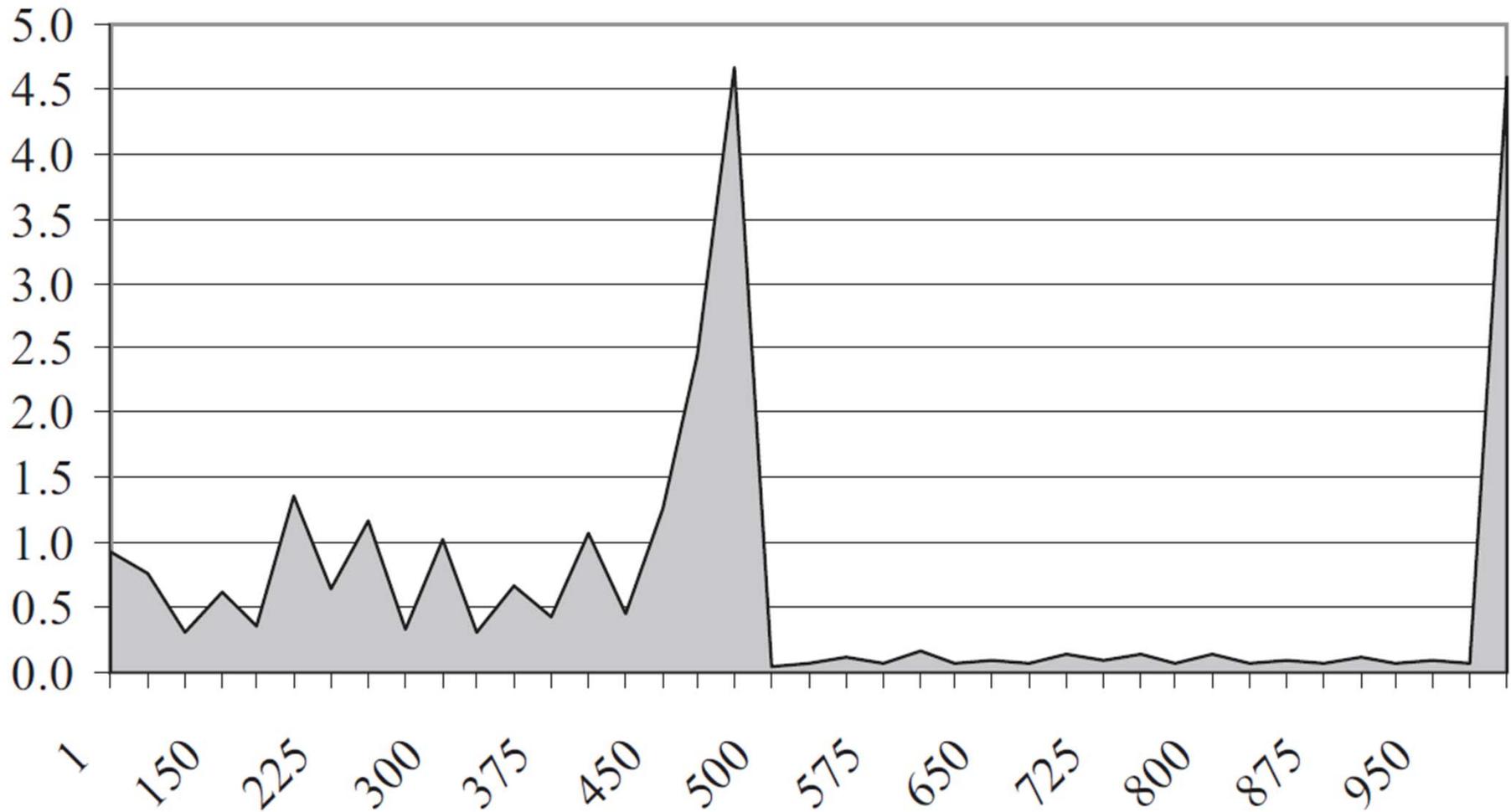
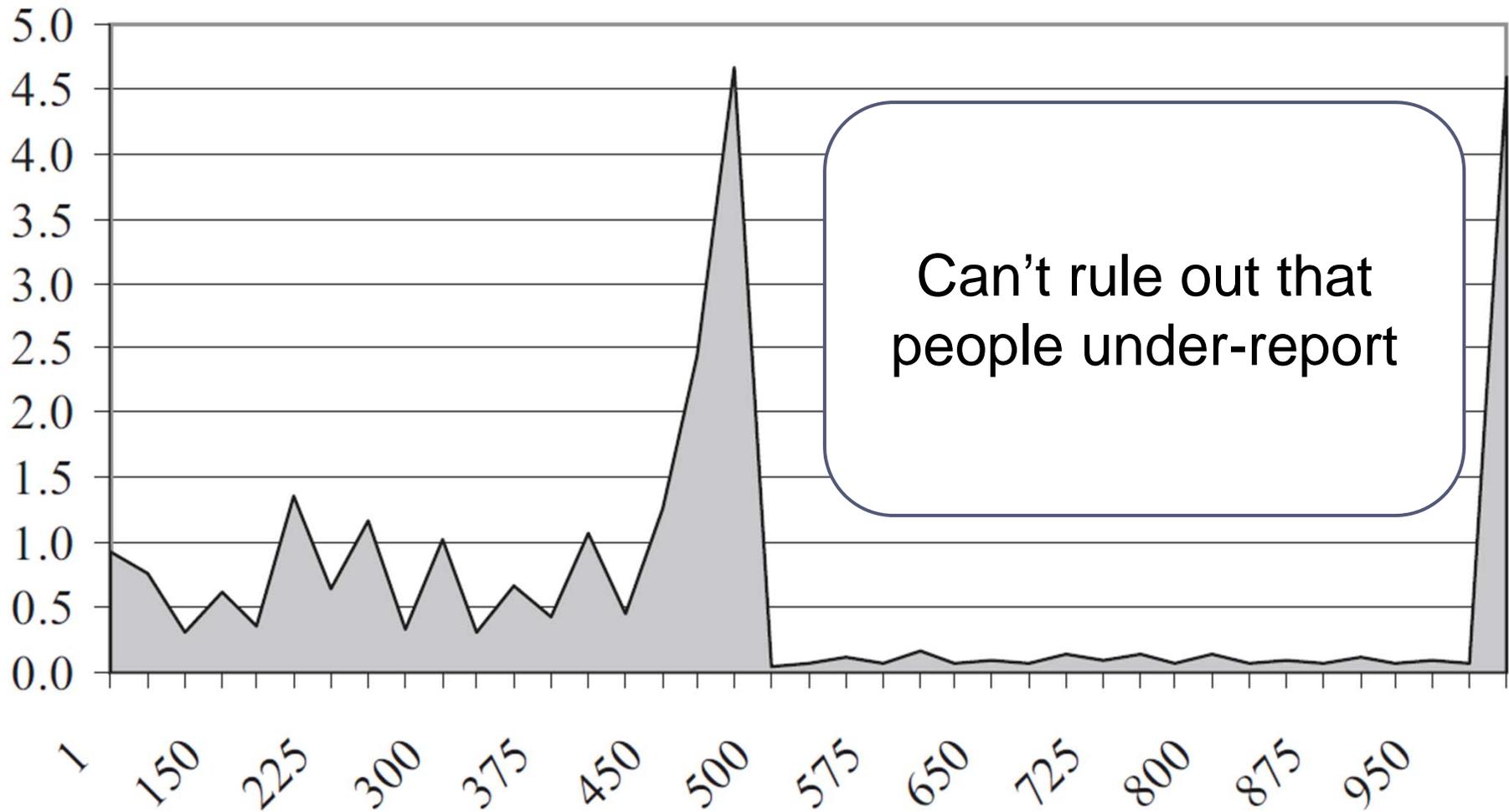


FIGURE 1:
DISTRIBUTION OF NONCASH DEDUCTIONS, 2005

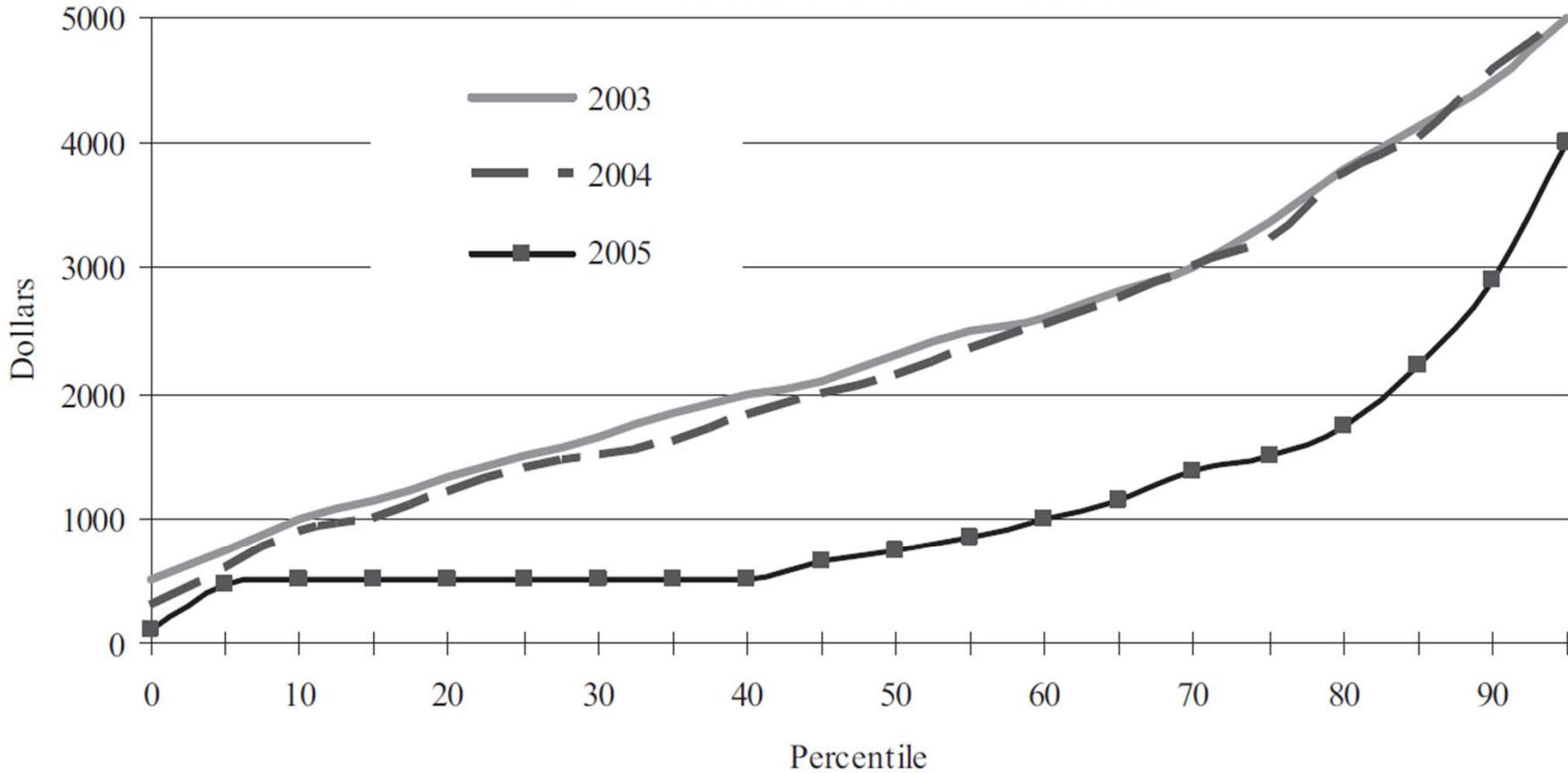


2.c. Charitable deduction used for tax avoidance

- ▶ Ackerman & Auten (2008)
 - ▶ Vehicle donations from subset of those reporting noncash donations of at least \$500 because (only these taxpayers are required to report detailed information about their donated items).
 - ▶ Prior to 2005: taxpayers donating vehicles of less than \$5,000 were responsible for assigning the value themselves
 - ▶ After 2005: donations in excess of \$500 limited to the gross proceeds from the sale



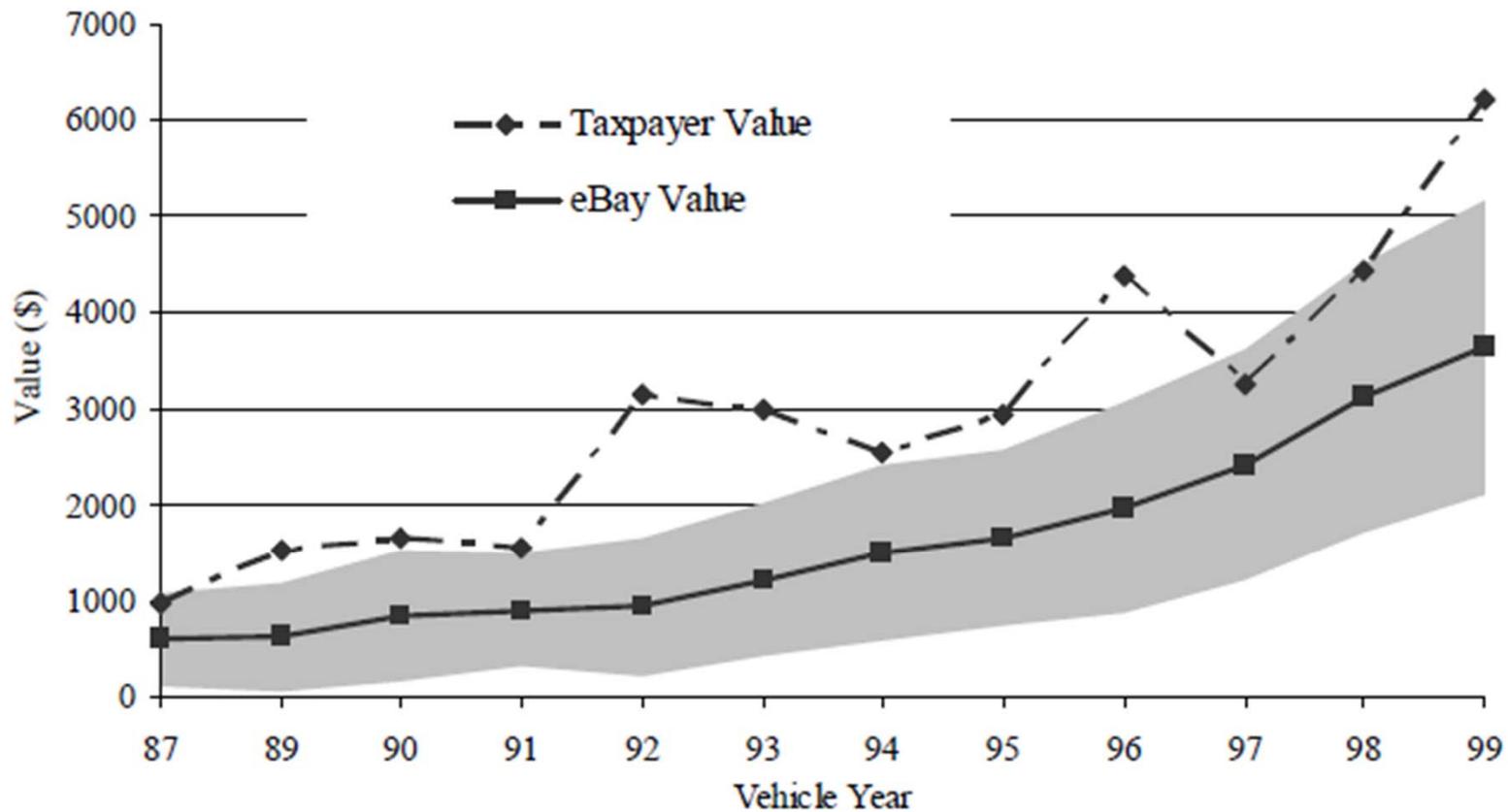
FIGURE 2
MEDIAN TAXPAYER VALUATION OF DONATED AUTOMOBILES BEFORE
AND AFTER THE LAW CHANGE



Source: Internal Revenue Service, Statistics of Income, 2003 - 2005 Individual Income Tax Returns. eBay Motors 2003. Tabulations by the authors.



FIGURE 3
TAXPAYER AND AUCTION VALUATIONS OF USED FORD TAURUSES BY
MODEL YEAR (2003 TAX YEAR AND SALES)



Source: Internal Revenue Service, Statistics of Income, 2003 - 2005 Individual Income Tax Returns; eBay Motors 2003. Tabulations by the authors.

2.c. Charitable deduction used for tax avoidance

- ▶ Ackerman & Auten (2008)
 - ▶ Evidence of significant overvaluation of used cars by donors on their tax forms.
- ▶ Yermack (2008)
 - ▶ Examine large charitable stock gifts by Chairmen and CEOs of public companies. Examine gifts to family foundations.
 - ▶ These gifts (not subject to insider trading law) often occur just before sharp declines in their companies' share prices.
 - ▶ Timing is more pronounced when executives donate their shares to their own family foundations



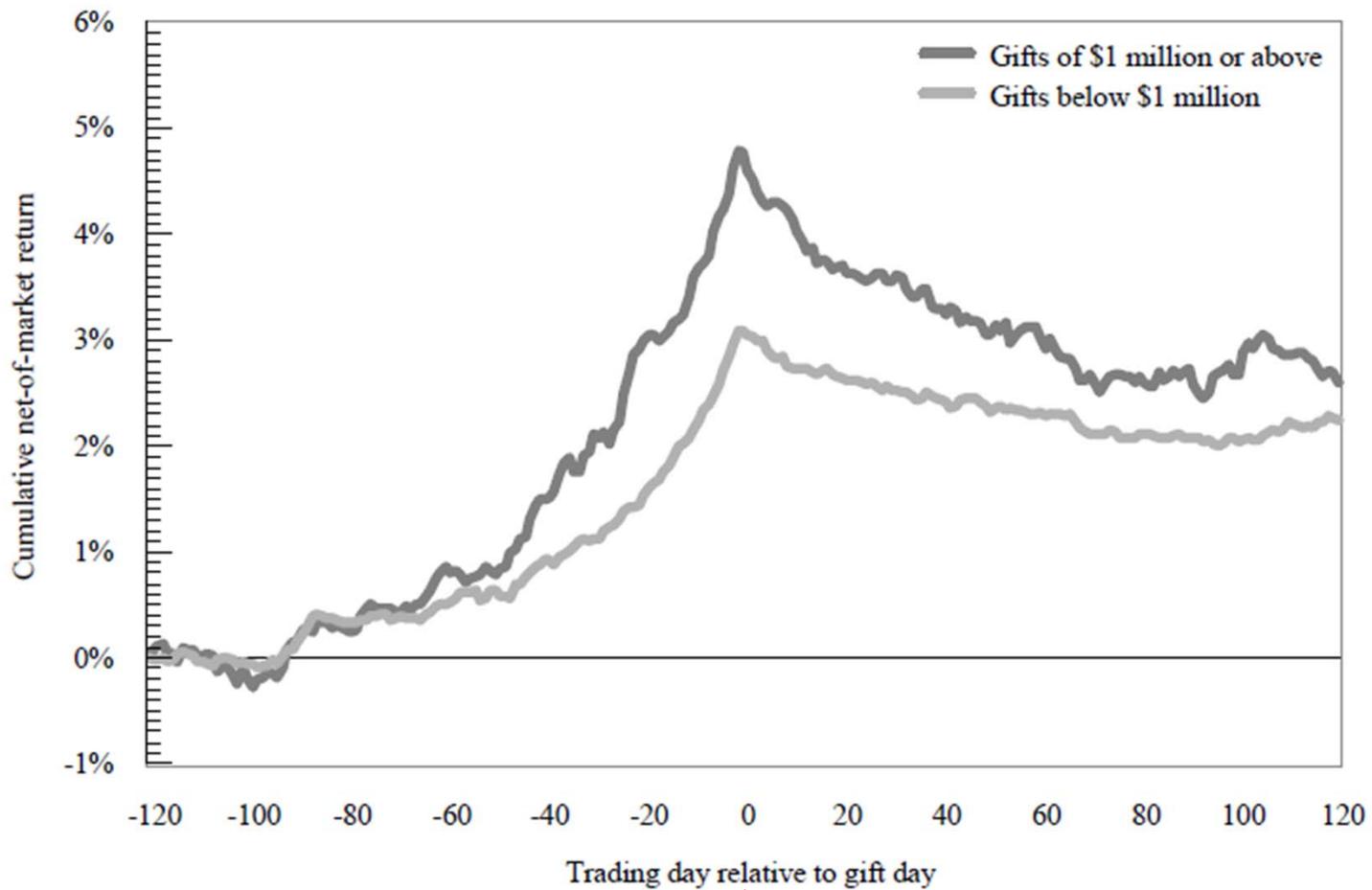


Figure 3
Shareholder returns surrounding dates of large stock gifts by top corporate executives

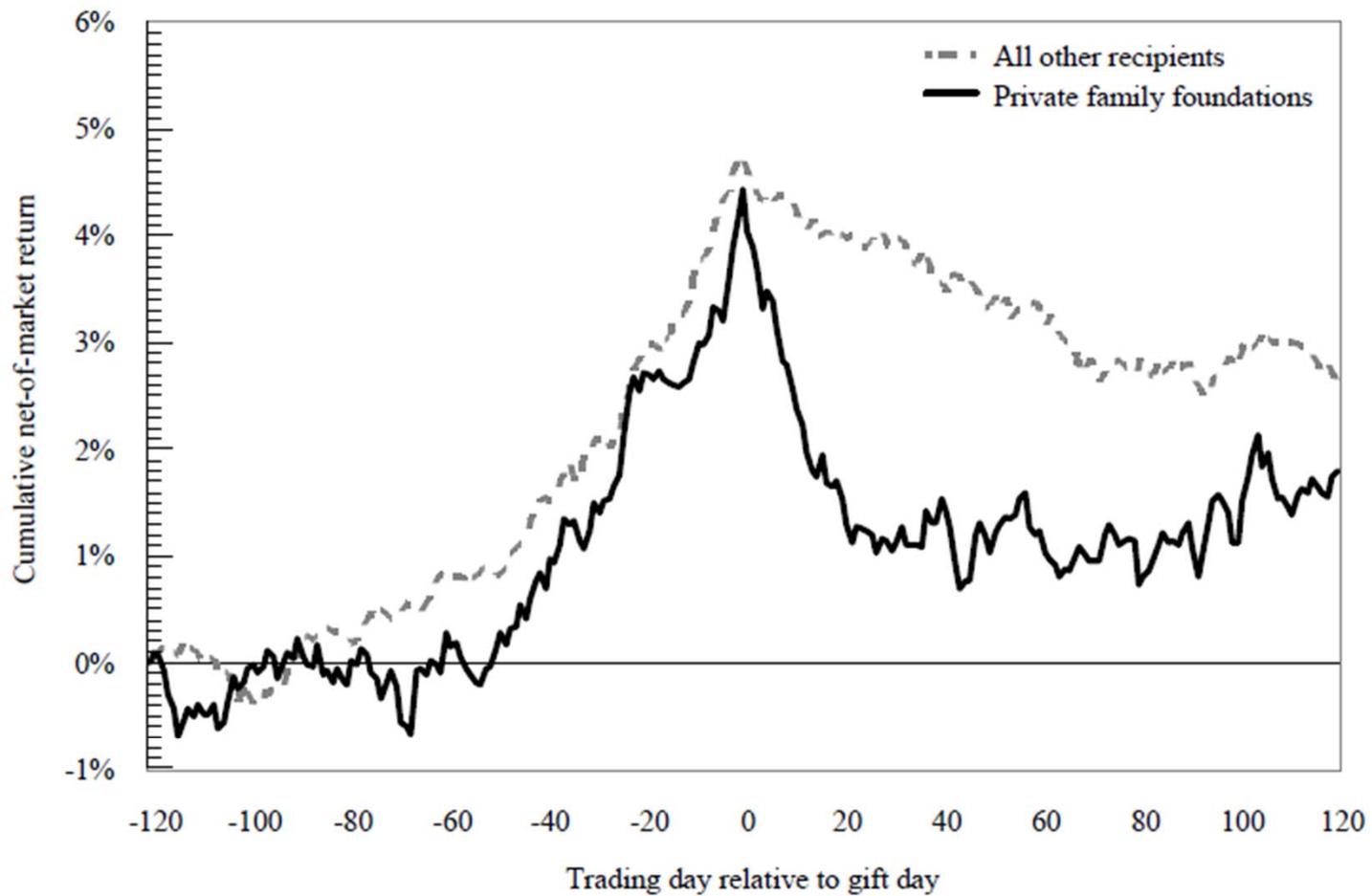


Figure 4
Shareholder returns surrounding dates of executives' stock gifts, sorted by recipient

Back dating

- ▶ Yermack
 - ▶ Evidence related to reporting delays and seasonal patterns suggests that some CEOs backdate stock gifts to increase personal income tax benefits.
 - ▶ CEOs' family foundations hold donated stock for long periods rather than diversifying, permitting CEOs to continue voting the shares.
- ▶ Nixon back dating:
 - ▶ The most famous case of a fraudulently backdated charitable gift came to light in the 1974 Congressional investigation of President Richard M. Nixon's personal income tax returns.
 - ▶ While serving as president, Nixon donated his vice presidential papers from the Eisenhower administration to the National Archives and claimed that the gift had occurred in early 1969, entitling him to a \$576,000 tax deduction.
 - ▶ Congressional testimony by a federal archivist later revealed that the true date of the gift was one year later, after an intervening change in federal law had made the deduction worthless. Nixon denied knowledge of the backdating, was ordered to pay restitution to the U.S. Treasury. His tax advisor pleaded guilty to fraud and received a four month jail sentence.



Charitable deductions as tax shelter

- ▶ Fack and Landais (2010)
 - ▶ Three welfare sufficient statistics necessary to assess tax subsidy optimality
 - ▶ Price elasticity of reported contributions
 - ▶ Share of contributions that are cheated
 - ▶ Price elasticity of cheating contributions
 - ▶ Conclude: cheating is a first-order consideration for the design of optimal subsidies
- ▶ Cheating may play a central role in our estimates of price sensitivity
- ▶ Perhaps an explanation for the lower price sensitivity for religious giving?



Next: Groups: Norms, Institutions and sorting

- ▶ Elinor Ostrom, *Governing the Commons*, chapter 3, Governing the Commons: The Evolution of Institutions for Collective Action
- ▶ Theodore Bergstrom, The Uncommon Insight of Elinor Ostrom, *Scandinavian Journal of Economics*, 2010
- ▶ Ahn, T.K., Mark Isaac and Timothy C. Salmon. Coming and Going: Experiments on Endogenous Group Sizes for Excludable Public Goods. *Journal of Public Economics*, Vol. 93, No. 1-2 (2009): 336-351.
- ▶ Ahn, T.K., Mark Isaac and Timothy C. Salmon. Endogenous Group Formation, *Journal of Public Economic Theory*, Vol 10. No. 2 (2008) 171-194.
- ▶ Sutter, Matthias, Stefan D. Haigner, and Martin G. Kocher. 2009. "Choosing the Carrot or the Stick? – Endogenous Institutional Choice in Social Dilemma Situations."
- ▶ Cinyabuguma, Matthias, Talbot Page, and Louis Putterman. 2005. "Cooperation under the Threat of Expulsion in a Public Goods Experiment." *Journal of Public Economics*, 89: 1421-1435.
- ▶ Ehrhart, Karl-Martin, and Claudia Keser. 1999. "Mobility and Cooperation: On the Run."
- ▶ Gürer, Özgür, Bernd Irlenbusch, and Bettina Rockenbach. 2006. "The Competitive Advantage of Sanctioning Institutions." *Science*, 312(5770): 108-111.



Frey and Meier (*AER* 2004)

- ▶ Findings:
 - ▶ 64% info: 77% contribute to at least one fund
 - ▶ 46% info: 74.7% contribute to at least one fund
- ▶ Difference not significant
- ▶ Controlling for past behavior find greater giving in 64% info treatment
- ▶ Conclude: information on other giving increases contributions – but mostly for those who have not previously made a contribution decision



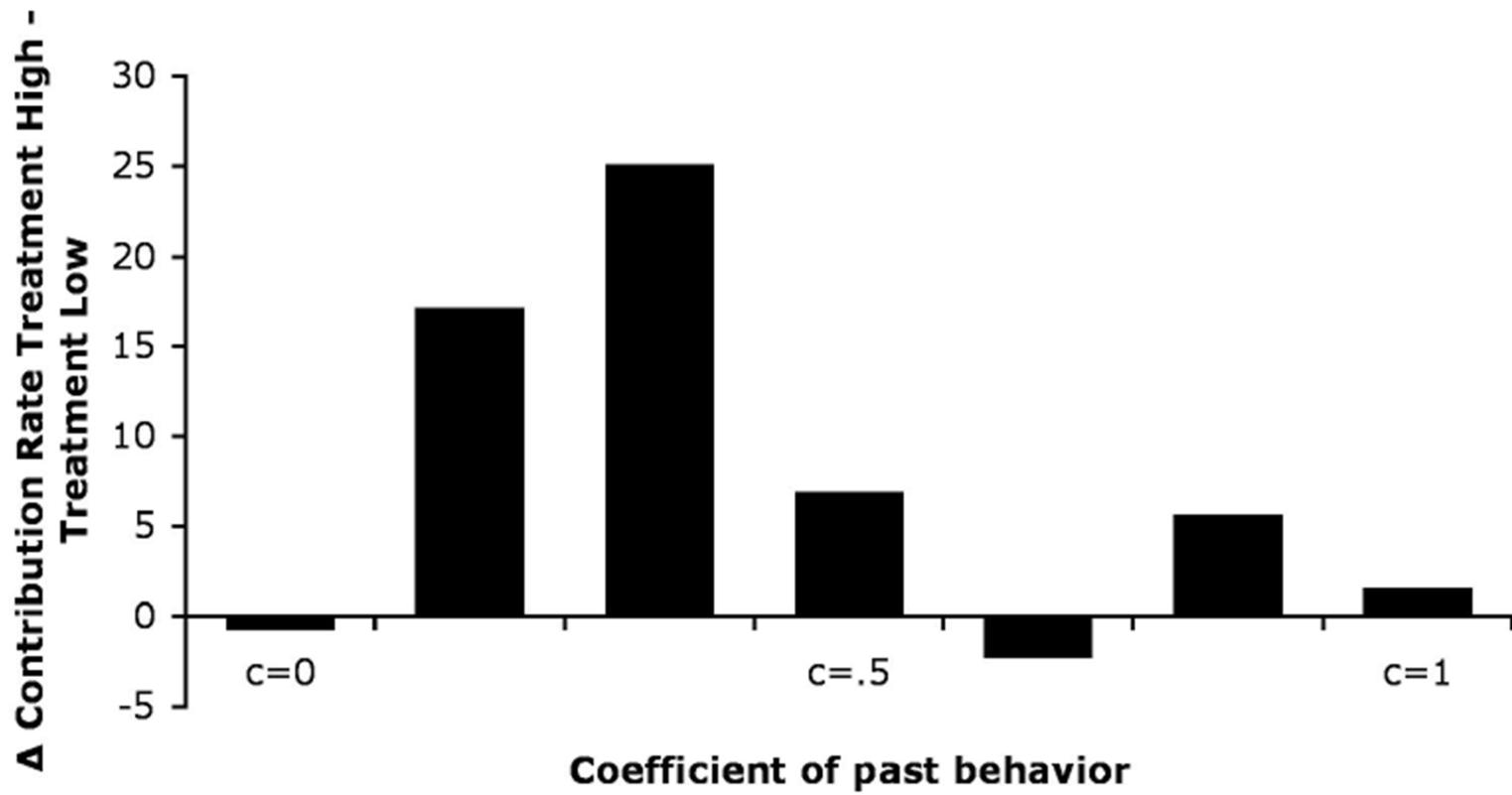


FIGURE 1. DIFFERENT REACTIONS TO OTHERS' BEHAVIOR